Exploring Teaching and Learning of Critical Thinking in Private Schools in Dubai

استكشاف تعلم وتعليم التفكير النقدي في المدارس الخاصة في دبي

by
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Abstract

Critical thinking is one of the most desirable skills of the 21st century which is required to meet the challenges associated with today's modern world of technology. The current study aims to explore and analyze the various teaching methods and strategies utilized by the teachers in private school in Dubai. It focuses on promoting critical thinking skills amongst students. The current research adopts a mix method approach in the research design whereby teachers and students of grades 4 and 5 of a Dubai private school participated. A quantitative research method utilizing teacher and student questionnaires were used and analyzed using SPSS software. Qualitative research methods are utilized to support the results obtained by quantitative methods which includes various classroom observations of grades 5 and 6. Results of the study depict that various teaching strategies are being utilized by private school teachers in Dubai to promote critical thinking amongst students. These teaching methods and strategies include group discussion, brain storming, encouraging students to ask questions and share their viewpoint along with cultivating a sociological classroom learning environment that is conducive for learning critical thinking skills. The results depict that teacher's teaching strategies have a positive relation with student's learning methods and increasing teaching strategies also enhances student's learning. In addition, no significant differences were observed in the teaching strategies and methods in different subject classes and grades.

Keywords

Critical Thinking-Teaching Strategies-Private Schools in Dubai

نبذة مختصرة

يعتبر التفكير النقدي أحد أكثر المهارات المرغوبة في القرن الحادي والعشرين واللازمة لمواجهة التحديات المرتبطة بعالم التكنولوجيا المعاصر. تهدف الدراسة الحالية إلى استكشاف وتحليل أساليب واستراتيجيات التعليم المختلفة التي يستخدمها المعلمون في المدارس الخاصة في دبي، كما تركز على تعزيز مهارات التفكير النقدي بين الطلاب. اعتمد هذا البحث على منهج متعدد/مختلط (mixed method approach) في تصميم البحث حيث شارك مدرسون وطلاب من الصفوف 4 و5 في مدرسة خاصة في دبي. تم استخدام طريقة البحث الكمي باستخدام استبيان المعلم والطالب وتحليلها باستخدام برنامج SPSS . في حين تم استخدام أساليب البحث النوعي لدعم النتائج التي تم الحصول عليها بالأساليب الكمية التي تشمل مختلف الملاحظات الصفية من الصفين 5 و6. توضح نتائج الدراسة أن معلمي المدارس الخاصة في دبي يستخدمون أساليب واستراتيجيات تعليمية متنوعة لتعزيز التفكير النقدي لدى الطلاب. تتضمن أساليب واستراتيجيات التدريس هذه المناقشة الجماعية، والعصف الذهني، وتشجيع الطلاب على طرح الأسئلة ومشاركة وجهات نظرهم إلى جانب تهيئة بيئة تعليمية اجتماعية في الفصول الدراسية تساعد على تعلم مهارات التفكير النقدي. تظهر النتائج أيضًا أن استراتيجيات التدريس الخاصة بالمعلم لها علاقة إيجابية بطرق تعلم الطالب كما أن استراتيجيات التدريس المتزايدة تعزز أيضًا تعلم الطالب. بالإضافة إلى ذلك، لم يكن هناك اختلاف مهم في استراتيجيات التدريس وطرق تدريسها في حصص المواد المختلفة أو الصفوف المختلفة.

الكلمات الدالة

التفكير الناقد - التفكير النقدي - استراتيجيات التدريس

Dedication

With the blessings of Allah Almighty, I have reached to this milestone of my life where my Master's in Education is being completed. First of all, I am grateful to Allah Almighty who gave me strength to accomplish this task. I dedicate this work to my parents who have played a most crucial role in developing my academic records. To my loving husband Waqas Ahmad Sheikh for being my strength and always motivated me in my studies.To my dear children, Ahmad and Mustafa for always supporting and encouraging me in my studies.

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Chapter 1: Introduction

Thinking is one of the most important part of human lives. Moreover, critical thinking is considered as the most desirable skill of the 21st century as it helps to prepare the students for the future by having a critical look about the problems in the society. Duran et al. (2006). Critical thinking is an essential skill needed by the students as it helps them to develop their cognitive abilities and further to analyze people and policies thus preventing social problems. The 21st century has observed momentous changes in all features of life education. 21st school students should be taught skills that are different from the last century. Modern schools and universities must prepare the students for a challenging skill-oriented workplace that are highly required in the modern world. Robinson & Kay (2010) emphasize that people now a days are becoming more and more conscious of the need for the students to develop higher order thinking skills to handle the demands of the modern society. Putch and Hamid (2014) also emphasizes that the professional leaders in the society are looking for the graduates with innovation and effective thinking. Arsal(2015) stress on the necessity to equip educators with the teaching critical thinking skills as a significant part of the education. Forawi (2016) also emphasizes that the critical thinking skills should be embedded in an effective way in the classroom teaching. Forawi (2012) further emphasizes that the educators should be aware of the critical thinking skills in order to teach them effectively to their students.

Critical thinking has many features and various teaching methods to enhance its application among learners. Habók, & Nagy (2016) emphasizes that student centered teaching methods tend to increase learner's critical thinking skills. Same idea is supported by Dando (2016) that enhancement of cooperative and interactive teacher student experiences with concentration on student's thinking should be highlighted. In a survey of 433 institutions of higher education 95% of the academic officers acknowledged critical thinking as one of the most significant skills for students and noted that 81% of employers required universities to strongly develop student's critical thinking skills. (AAC&U, 2011). Yeh (2002) emphasizes that students should be introduced to real-life situations that would allow them to approach problems, analyze them and then reach to the solutions to the problems.

Stedman & Adams (2012) emphasizes that developing critical thinking skills in the students has been identified as the most vital goal of colleges and universities. Kong (2015) supports the idea

that the rise of knowledge-based economy over manufacturing economy leads to conclusions that positive results are based on good critical thinking skills.

The world functions at a rapid pace. All countries are interconnected, and the world has become a global village. With the advent of internet information is achievable within seconds. Thus, there is evermore need today for thinkers who can think, challenge and process information with the help of critical thinking skills in order to transform world into the unified community of critical thinkers. Duran &Dökme (2016). emphasizes that the students must enter the 21st Century completely prepared with skills that empower them to think proactively and critically to meet the challenges of the future.

Pattanapichet and Wichadee (2015) emphasizes that critical thinking skills are required not only for economics, politics or education but is utilized in every aspect of life. Forawi (2012) emphasizes that prospects for attaining such important logical skill such as critical thinking has been infrequent in the history. Recent history has shown that it is essential in the society to increase student's rational thinking capabilities to enhance improving the quality of life. Wright and Forawi (2000) also emphasizes that science researchers have profoundly researched and studied Critical thinking. But some scholars, Lauer (2005). argues that students are not able to effectively utilize the critical thinking skills. Crenshaw et.al (2011) also support the idea that now a days, the educational environment is not promising for adequate educational instructions in classroom to enhance critical thinking. Smith,et.al (2018) emphasize that the challenge that the 21St century school encounter is to let teachers cooperate with the aim of producing improved teaching strategies, transforming curriculum and creating creative and innovative assessments for better thinking skills.

Effective teaching skills results into effective student's learning especially promoting student's higher order thinking (HOT). Fisher (2001) emphasizes that in order to develop student's higher order thinking, teachers should enhance learner's involvement in teaching tasks that promotes student's application, analysis, synthesis and of evaluation of information. The same view is echoed by (Ivie, 1998; Underbakke, Borg & Peterson, 1993) that HOT incorporates any thinking skill that require more than just recalling or memorization of knowledge or information. The importance credited to students' development of HOT is monumental, so much so that Dewey

suggests (1916), “all which the school can or need do for pupils, so far as their minds are concerned is to develop their ability to think”.

1.1 Problem Statement

One of the most important objectives of modern education is to develop individuals with effective critical thinking skills. Some researchers highlight that critical thinking skills are vital to be successful in future. (Tiwari,et.al 2006). Due to changes in the educational system in the recent times, student centered curriculum with special emphasis on the development of critical thinking skills is getting more attention. (Asgharheidari & Tahriri, 2015). As critical thinking is logical and in depth in nature, thus it may be considered most advanced way of thinking. (Açışlı, 2016). Critical thinking helps to develop new and innovative ideas and thus individuals with critical thinking skills are treasured in the community (MEB, 2017).

UAE National Agenda aims for the country to be ranked among top 20 ranking in PISA and top 15 in TIMSS by 2021.The recent PISA results depicts that UAE outperformed the other participating Arab countries, but the overall results were not truly inspiring. Thus, improving PISA and TIMSS results require a true paradigm shift in teaching and assessment strategies and methodologies. There is a need of well qualified and well-trained teachers who promote student-centered learning, developing student’s critical thinking skills along with analysis and problem solving. Teachers should also promote student’s metacognitive skills by teaching them to set their goals and reflect constructively on their own learning.

Qing,et.al (2010). emphasizes that teachers who are skilled in critical thinking leads to the development of educational environment favorable for teaching critical thinking skills to students. In today’s times where learners actively take part in the learning process, students should be able to correlate new knowledge with the previous knowledge rather than just remembering it. Thus, it is necessary for the students to attain higher order thinking skills such as critical thinking along with problem solving and decision making.

Critical thinking is one of the most desirable skill of the 21st century that empower individuals to become more creative and innovative. Facione (1990) recognizes critical thinking in his famous report called the Delphi Report as a form of higher order thinking that develops person’s problem solving and decision-making skills. Delphi Report’s results depicts that a final agreement on the

critical thinking definition has been achieved as critical thinking is defined as self- regulatory, analytical and purposeful thinking which is important as an instrument of inquiry Thus, by educating critical thinking skills in the young students would lead to the future generation that is more creative, innovative and highly productive. Buskits and Iron (2009) emphasizes that increasing individual's critical thinking skills is the most important aim of modern education as it prepares them to achieve higher order thinking and apply knowledge in a creative way. Teachers play a very significant role in implementing critical thinking skills in their students as they can create an educational environment that is suitable for cultivating critical thinking skills. Howlett et.al (2016). supports the same idea that the role of teacher is very important in developing critical thinking skills in their students.

1.2 Relevance of the Study

United Arab Emirates (UAE) came into existence on 2, December,1971 by the formal unification of the seven emirates, Abu Dhabi, Dubai, Sharjah, Ras Al Khaimah, Fujairah, Umm ul Quwain and Ajman. UAE is situated on the Arabian Gulf east of Saudi Arabia and North of Oman. (Bradshew.et.al,2004). Education system of UAE is relatively new as compared to the other countries. In 1952, there were some formal schools in UAE but during 1960-1970 school building program in UAE extended the education system in UAE. Primary education becomes compulsory in UAE. Now a day's education at the primary and secondary level is widespread in UAE. In 2006-2007, approximately 650,000 students were enrolled at 1,256 public and private schools.(Emirates,2012)

Public education is free for all local Emiratis, majority of them would prefer to join private school's despite of high school fee in private schools. This is because parents believe that private schools provide high quality education by innovative teaching methods and strategies. Thus, parents feel that by studying in private schools, students have higher chances to be accepted in recognized international universities.

Dubai is ideally positioned as a doorway between East and West and has developed a unique identity as a modern and dynamic city. Dubai has global recognition as an important trade and financial hub. Continuous economic development depends on effective social development strategies. The continued development of high-quality private schooling is vital for economic

development of the country. Education that meets international standards is one of the significant areas of social structure that must continue to progress.

The private school sector in Dubai is flourishing with a growing demand for high quality education. The curriculum in Dubai's private schools is strongly influenced by curricula in the United Kingdom, United States of America, Canada and India. The number of Dubai's private school has increased from 177,587 in 2008 to 265,299 in 2015 with a rise of 49%. This progress is expected to grow with an estimated increase of 345,000 students in Dubai by 2020. (Khda.gov.ae, 2019) .The Knowledge and Human Development Authority (KHDA) was established in 2006 is in charge for the regulation of development of quality of private education in Dubai. KHDA support schools, universities, parents, students, educators, investors and government partners to generate a high-quality education sector based on happiness and wellbeing.

KHDA mission is in line with the UAE Vision 2021 that is to make sure that the quality of education in Dubai is equivalent to the finest in the world. UAE Vision 2021 sets out the National Agenda for the UAE to be the most innovative nation of the world. In the framework of the UAE's National Agenda, it acquires even more importance as the critical thinking has been identified as the most vital skill to develop innovation. Teaching critical thinking skills is becoming more important as it helps to develops person's innovative skills as the research confirmed that critical thinking and creativity are correlated (Ulger,2016). Thus, critical thinking is vital in the successful achievement of the UAE aspiration mentioned in the Vision 2021," Science, technology and innovation become the real drivers for the sustainable socio-economic development." Thus, cultivating critical thinking skills in the students from young age at school will help them to become more innovative. Research confirmed that a curriculum based on building critical thinking skills would benefit not only the students but community and humanity.

1.3 Significance of Study

Ability to think critically is a unique skill to match and cope with the ever-changing fast pace of life. With huge development in the global economies, today's students are now stepping into an ever-expanding and completely diverse job market. Hove Genal (Developing critical thinking skills in High school English classroom) emphasizes that it is even more necessary to teach today's

students to think flexibly and creatively to prepare them for the future jobs that does not even exist few years back.

Research on critical thinking can be referenced back to early by 1990 when Dewy (1990) linked critical thinking to application of knowledge to analyzing information. Bloom et al. (1956) researched about different abilities and skill under taxonomy level. Halpren (1999) research on critical thinking was based on the transferability of critical thinking skills by teaching. Hove (2011) researched about investigating the effect of teaching critical thinking strategies on student's thinking skills. Spelton (2011) researched about teacher's understanding of critical thinking skills and methods.

Development of critical thinking in young students has universal importance, thus researchers all around the world had been researching on this important skill. Lei Chen (1999) researched about the Chinses student's conceptualization of critical thinking as multi-faceted concept. Zuhal Cubuck (2006) explored the critical thinking disposition of the Turkish teachers and students.

In UAE, research on critical thinking had been done in past. Thabet (2008) researched on the development of critical thinking in UAE public school. Saad (2015) had researched on the development of critical thinking in private school in Abu Dhabi, UAE. Alayobi (2016) research focused on investigating grade 7 students critical thinking skill through Math intervention. Boucif (2014) researched on the effect of school curriculum on student's critical thinking abilities. However, there has been no particular study about critical thinking with respect to private school with reference to Dubai, UAE. Thus, the current research efforts to bridge the gap by in depth analysis of whether private school in Dubai, UAE develop critical thinking as one of the keys aims of education.

1.4 Research Purpose & Research Questions

The main purpose of this study was to investigate if the teachers in the Dubai private schools are applying critical thinking skills in their teaching strategies and whether the Dubai private schools are providing a classroom environment conducive to develop critical thinking among students. The results attained from the research will be used to recommend how to further develop and increase teaching and learning in private schools to enhance student's higher order thinking thus preparing them for the future.

1. How do teachers in Dubai private school develop a learning environment in the classroom to enhance student's critical thinking?
2. What teaching methods and teaching strategies are used by the Dubai private school teachers to enhance critical thinking skills among students?

1.5 Structure of the dissertation

First chapter of the research comprise of the introduction about the title of the study along with the problem statement, relevance of the study and important significance of this research. It also includes the research questions that will construct the study along with the purpose of the research. Second chapter of the dissertation comprise of the literature review that starts with the conceptual background about the critical thinking including the philosophical and psychological approaches to critical thinking definition. Followed by the previous studies in the field of critical thinking, discussing in detail about the role of teacher in creating a classroom environment conducive for teaching critical thinking. This chapter also discusses the importance of various teaching methods and strategies that can foster critical thinking among students of 21st century. The third chapter of the dissertation present the research design along with research methods utilized such as mix method approach including both quantitative and qualitative methods. This chapter also discuss about the sampling and the reason of choosing the participants and ethical considerations. It also discusses in detail about the instrument used for the study to collect data and then the analysis of the quantitative data through SPSS and the analysis of the qualitative data formulating codes and themes to find results. Fourth chapter includes the results by the analysis and interpretation of the data. Results are presented in the form of tables for easier understanding. As it is mix method study so analysis of both quantitative and qualitative data has been done. Fifth chapter includes the discussion about the research questions and the result obtained along with the conclusion of the study. It also discusses about the limitation of the study along with recommendations about the future research.

Chapter 2: Literature Review

Critical thinking has been defined in different ways but there is no standard or universally accepted way of describing critical thinking. Search of critical thinking suggest that the meaning of critical thinking has been described in terms of philosophy and psychology but there is a universal consensus on the definitive meaning of critical thinking. “Critical” is derived from the Greek word kritikos which means to judge, analyze and Socratic argument consists of thinking at that time (McGregor,2007). Critical Thinking Cooperation (2006) describes critical thinking as a skill that is higher than just memorization. Questioning is the keystone of critical thinking which is the foundation of the knowledge development. Researchers have been studying the concept of critical thinking from past century. Dewy is considered as the pioneer in the field of critical thinking and define critical thinking as a dynamic, reflective way of processing the knowledge (Dewy, 1909). Dr. Richard Paul has done remarkable research in the field of critical thinking. According to Paul & Elder (2006) critical thinking is a way of thinking in which the thinker enhances the quality of his thoughts by competently taking control of the thinking process and imposing intellectual standards on them. Paul (1992) also emphasized that the typical school system does not enhance the improvement of higher order thinking skills like critical thinking. Ennis (1996) suggests that the critical thinking is a reflective way of thinking that is intended at determining what to believe and do. Myrick (2002) also emphasizes that there is no single, universal definition of critical thinking. However, Moore(2013) emphasizes that the main feature of the critical thinking is that it is metacognitive in nature with insightful judgment that enhances the chances of generating logical conclusion to an argument. Although many researchers have described critical thinking in their own way but they all agree that critical thinking is a higher order thinking that enables the person to think in a broader way with logic and leads to better decision making.

2.1 Conceptual Background

The literature review on critical thinking has backgrounds in two academic disciplines: philosophy and psychology (Lewis & Smith, 1993).

Sternberg (1986) has also pointed a third critical thinking aspect in the field of education. This unique academic aspect has developed several approaches to define critical thinking that echo their respective concerns.

2.2 Philosophical Approach of Critical Thinking

Philosophical approach on critical thinking emphasizes on the hypothetical or theoretical critical thinker counting the abilities and features of critical thinker rather than the actions or behaviors of the critical thinker (Lewis&Smith,1993). Thus, philosophical approach to critical thinking is more suitable or convenient in an ideal scenario or situation. Paul (1993) explains critical thinking referring it to the perfection of thoughts. American Philosophical Association also emphasizes that an ideal critical thinker is curious, flexible, open minded, fair minded and eager to understand varied point of views. Strenberg (1986) pointed out that philosophical approach of critical thinking is directing more towards what people can do in an ideal situation.

Sternberg (1986) has noted that this school of thought approaches the critical thinker as an ideal type, focusing on what people are capable of doing under the best of circumstances. Strenberg (1986) also emphasizes that one of the limitations of the philosophical approach to defining critical thinking is that not always it corresponds to reality.

In the history, Socrates,

Aristotle, Plato and in recent times, Matthew, Lipman and Richard Paul represent the philosophical approach to critical thinking.

Philosophical theories of critical thinking are theories of logic about comprehending the issues to see what a person require for thinking.

Socrates linked critical thinking to philosophy by his experimental dialogues. In his opinion, critical thinking means discovering the truth (Neistani, 2011). Subsequently Socrates, Plato and then Aristotle continued their search about thinking. Plato thought that people are discovering the knowledge while Aristotle was of the view that logical talent is one of the most significant features of people.

Definitions of critical thinking developing from the philosophical approach are as follows:

- Ennis (1985) explains critical thinking as "reflective and reasonable thinking that is focused on deciding what to believe and do"
- Lipman (1988) explain critical thinking as "skillful, responsible thinking that facilitates good judgement because it relies upon criterion. Critical thinking is self-regulatory and sensitive to the context."
- Bailin et al., (1999) explains critical thinking as "thinking aimed at forming a judgement"
- Paul (1992) defines critical thinking as self-disciplined, self-directed and self-monitored domain of thought. Paul (1992) is of the view that the person's thinking can be improved by education and self-modification.
- Facione (2000) defines critical thinking as "judging in a reflective way what to do or what to believe"

2.3 Psychological Approach of Critical Thinking

The psychological approach to critical thinking differs from the philosophical approach in many ways. Strenberg (1986) explains that psychological approach to critical thinking focuses mainly on how people think as compared to how they should think under ideal situations. Another difference is that cognitive psychology defines critical thinking by the type of actions or behaviors the person can do as compared to the philosophical approach that focuses on the characteristics of the ideal thinker. Lewis& Smith (1993) also emphasizes that the psychological approach to critical thinking comprise of list of skills achieved by the critical thinker. Thus, psychologists focus on the cognitive process, components application used to analyze problems unlike philosophers that emphasizes on the characteristics and the nature of the critical thinking as a product. (Reed,1998).

Smith (1993) explains that psychologists endeavor to make relationship between critical thinking and high-level skills but majority favor high skills instead of critical thinking. Thus, psychologists emphasize more on cognitive psychology and intellectual theories (Halpren,1998).

As the thought process is an unobservable phenomenon, thus psychologists intend to emphasize on the outcome of such thoughts such as behaviors or obvious skills. For example, analysis,

interpretation & synthesizing. But philosophers have argued that critical thinking is much more than simply the sum of its components (Van Gelder,2005).

Definitions of critical thinking developing from the Cognitive approach are as follows:

- Sternberg (1986) define critical thinking as "the intellectual process, strategies and representations people use to solve problems, learn new concepts and make important decisions"
- Halpren (1998) explains critical thinking as the cognitive skills that enhances the chances of the favorable outcome.
- Willingham (2007) explains critical thinking as combination of reasoning by seeing both sides of an issue, making judgments, decisions and problem solving. Willingham (2007) further explains the key features of critical thinking that is effectiveness, novelty and self-direction.

2.4 Importance of Critical Thinking

Critical thinking basically improves one's thinking and most important one's learning. It integrates how individuals learn to continuously improve on one's thinking by constantly checking on the strengths and the weaknesses in one's thinking to sustain the strengths and improve on the weaknesses of thoughts. In a research by the American Associate Colleges & Universities (AACU Report, 2009) 74% participants responded that critical thinking is one of the fundamental learning objectives of the educational curriculum. Where there is mutual harmony at the importance of critical thinking in education by the entire educationalist, at the same time there is ambiguity as to what precisely critical thinking is. Paul et.al, (1995) emphasizes that 89% of the teachers in a research in California could not define critical thinking clearly although they mention that they integrate critical thinking in their teaching. At the same time, research also depicted that most teachers were not able to give valid examples of how they implemented critical thinking in their classroom. Thus, Paul et al., (1995) finally summarized the data of the research as majority of the teachers lack the clear perception of the critical thinking and do not possess the logical principles that they can actually put into clear words. Thus, when teachers are unable to clearly understand and define critical thinking, then, eventually they are unable to implement critical thinking in their classroom teaching as well.

Same idea is echoed in another research by Halpern, D. S. (1999) where they noticed that the faculty appreciates the importance of critical thinking in the teaching but were not properly trained in the field. Thus, individual faculty had established their own discrete definition of critical thinking.

William (2005) emphasized the importance of professionally developing critical thinking skills of the teachers so that they can foster the critical thinking skills in their students Thus, creating a society that is well aware of critical thinking will lead them to be better at problem solving, decision making and thus overall enhancing the progress of the society.

Review of literature suggests that there are various definitions of critical thinking from scholars in the field of education and philosophy. Turner (2005) is of the view that more numbers of stated definitions and features of critical thinking actually render to decline the chances of reaching a consensus. However,

Jones (2010) emphasizes that there are underlying similarities in all the definitions and the features of the critical thinking. Ten Dam & Volman (2004) also agree with the concept that the general characteristics of critical thinking are present, and they can be usefully applied in any subject matter.

Facione (1990) identifies critical thinking in his famous report called the Delphi Report as a form of higher order thinking that enhances person's problem solving and decision-making skills. Delphi Report's results show that a final agreement on the critical thinking definition has been achieved as critical thinking is defined as self- regulatory, analytical and purposeful thinking which is vital as an instrument of inquiry.

Qing et al., (2010) utilized the California Critical Thinking Skills Test to explore the effects of critical thinking integration in the chemistry lessons. The result of the research depicts that student's critical thinking skills were improved with the application of inquiry-based teaching.

Unks (1985) emphasized on the significance of teacher's critical thinking skills that if the teachers are not well aware of the critical thinking skills, then they are unable to teach it effectively to their students. Nicolle (1996) also supports the idea that the critical thinking skills in the students can be promoted by professionally developing critical thinking skills of the teachers.

2.5 Critical Thinking-An Important 21st Century Skill

Critical thinking is considered one of the most important skills required 21st Century as 21st Century is specified with the enhancement of technology and knowledge. In the modern world, there is a global shift of paradigm that is influencing the view and organization of society and work. Milliken (2004) emphasizes that there is huge evolution of information, economy, technology etc. and there is ever more need of evolution in the domain of teaching. Dimmitt (2017). emphasizes that in 21st century we are in better position to understand how things work or how they don't work. As society, workplace, learners are all different so as the problems now a days are different too. Because of this reason, the answer to the problems should be different too.

As the information and knowledge seems more significant as compared to industrial production, so the intellectual capital of the people has become the driving force of 21st century. Thus, students in the modern world are not only expected to think but also to have higher order thinking skills. Critical thinking is considered as the most desirable skill of the 21st Century. As there is a worldwide advancement in every sphere of life, students are required to be more knowledgeable and competitive to face the challenges and problems of the modern life and work. Thus, students need to develop the higher order thinking skills like critical thinking to come up with the complex solutions of real-life problems of modern world.

Butler et al (2017) emphasizes that teaching critical thinking skills to students is becoming more important as it gives more deeper comprehension of information they come across and develops problem solving skills and strong decision making in students. Juke &Mc Cain (2002) supports the idea that critical thinking skills are needed ever more in the modern world as it helps the people to become more adjustable and better skilled to deal with fast developing information.

Pithers & Soden (2000) emphasizes that in the 21st Century, it has become more vital to develop critical thinking skills in education as people have realized the immense changes that technology was empowering and demanding regarding knowledge and information. Lewis et.al. (2014) supports the idea that promoting critical thinking in students especially in the Science subject lead the students to better comprehension of the scientific processes at the same time motivating them to be more analytical and experimental in different aspects of Science.

Butler et.al (2017) highlights the importance of critical thinking in his recent study. Butler (2017) argues that unlike intelligence that is more related to genetics, critical thinking can be developed and enhanced by with proper teaching and training. The study also depicts that people with critical thinking skills have less negative life events as compared with people with high intelligence.

Butler (2017) further explains that critical thinking is frequently confused with intelligence, but critical thinking is the collection of thinking skills that leads people to think logically and flexibly requiring evidence to support their beliefs in a goal-oriented style.

According to World Economic Forum (WEF) report, The Future of Jobs (2016), innovation skills are crucial for the future success. According to the WEF list for top innovation skills needed in 2020 and beyond, critical thinking is one of the three top skills required for future success.65% of children going the primary school now a days will eventually be working in an entirely new job types that do not exist in the present. Thus, in such a fast pace emerging employment situation, the capability to foresee and prepare for the future innovative skill is more and more important for governments, business and individuals to completely grasp the opportunities offered by these trends and to increase desirable outcomes.

We are now at the starting of the 4^{th} Industrial Revolution. There had been a lot of development and progress in the unique fields like artificial intelligence, advance ronbotics,3D printing, biotechnology, genetics. Smart systems are being developed in homes, farms, factories etc. All this progress in technology will change the mode of our work and life. New jobs will grow in the market and at the same time some jobs will disappear. Jobs that do not even exist now a days will become the routine jobs in the future.

This takes us back to school system as the school system is responsible to educate the children in a way so that they are prepared to face the challenges of the future. One of the priority goals of the modern education should be teach students the innovation skills like problem solving, creativity and critical thinking so that students can handle the future challenges in the most effective way and be successful in the modern world.

2.6 Developing Critical Thinking

At this of age of globalization, knowledgeable and skilled workforces are crucial in a country's economic development. (Davenport,2005). Today's generation must be prepared with the skills to efficiently handle information, teamwork, problem solving and thinking critically. Redmond (2000) supports the idea that the ability to produce innovative and creative ideas is among the top skills required in the 21st century. The reason being innovative ideas are the most vital part of decision making and effectively handling a problem. (M.H. Yee et.al,2003). Same idea is supported by Weelihan (2011) that creativity and innovation are the foundations of the success in today's ever-changing, highly competitive modern society. Complex thinking skills are required to process the gathered information in order to produce a new idea. (Mayer,2000). Higher order thinking allows the students to sort out the required and effective information in an age that is full of excessive unprocessed information (Phillips, 2004).

Innovative and creative ideas can only be produced through higher order thinking like analyzing, interpreting, synthesizing information instead of lower order thinking. Thus, by becoming proficient in higher order thinking is vital to cultivate talents for new discoveries and development of new ideas. Same idea is supported by (Sulaiman, et.al 2011) that the higher order thinking is one of the important aspects to attain success in new discovery, invention and development.

Critical thinking is the pumping heart of academia, letting the whole business alive. Critical thinking is a skill that is required every day to direct the world around us. Critical thinking in an educational environment will develop on student's current abilities. Critical thinking can be related to Bloom's taxonomy which is very well-known classification of learning. Critical thinking skills are an important part of thinking classification level in Bloom's taxonomy.

Fig 1. The Bloom Model of Learning Hierarchies

Figure 1. illustrates pyramid developed by Benjamin Bloom in 1956 which is the hierarchical ordering of the cognitive skills that assist teachers to teach the subject and students to learn the concept. Blooms taxonomy comprise of knowledge, comprehension and application as lower order thinking skills whereas analysis, synthesis and evaluation as the higher order thinking skills. Critical thinking is considered as vital part of both higher and lower order thinking skills. To develop critical thinking, thinkers are required to go through all the six levels of cognitive thinking described by Bloom that is knowledge, comprehension, application, analysis, synthesis and evaluation.

Students should be able to step by step attain through each level starting from lower order thinking to higher order thinking and the teachers can support and guide the student's understanding at each stage to reach to the apex of the critical thinking.

The aim of developing critical thinking skills is basically to have a quality of thought in which quality of thinking is essential not only in school or institution but also outside the school. (McGregor,2007).

Swartz (2001) emphasizes that the thinking skills are linked to the student's capability to understand the thought process while understanding the content of the subject. Review of literature suggests that many educators are of the view that there should be explicit teaching of the thinking skills and the students should be clearly informed about the thinking skills learned by them. Rajendran, (2010) emphasizes that the critical thinking skills in the students can be well developed if the teachers develop a classroom environment favorable for the development of thinking skills. Nodding (2008) &van Gelder (2005) supports the idea that real purpose of education is to basically

promote the critical thinking skills in the students. Especially, this matter is more substantial in the higher education, as it is through the university study that the students get prepared to enter the job market obtaining and achieving resources that help them to face the various challenges of the future, (Barnes,2005).

Researchers have broadly divided two methods of the development of critical thinking skills in the students. Lipman (1985) is of the view that thinking skills should be taught separately during teaching. Swartz (2001), McGuinness et al (2003) are of the view that the thinking skills should be integrated in the various subjects taught in the school. Swartz (2001), Butera et al. (2014), Rajendran (2010) supports the idea that integrating critical thinking skills in the subjects in schools is a more natural way of teaching and thus is more effective in the development of critical thinking skills in the students.

2.7 Classroom Environment to Enhance Critical Thinking

A learning environment is essential in the classroom to enhance the critical thinking skills among students.Heick(2014) emphasizes the idea that teachers should create classroom learning environment and classroom activities that give confidence to students and build their critical thinking skills. In the past, there had been many researches on the learning environment that emphasize on classroom observations (Anderson & Walberg 2003).Students learning and creativity is decreased in a strict and intimidating classroom environment. Thus, teachers should endeavor to make relaxed, peaceful classroom environment by encouraging students to participate in classroom activities and by accepting different opinions and ideas of students.

Mathew & Lowe (2011) emphasized that different features of classroom environment such as teacher student relationship, type of content studied in class, interaction among peer students and the classroom learning activities directly influence student's critical thinking. Teachers should develop classroom learning environment in such a way to hold the interest of the students by having purposeful discussion and welcoming the thoughts and views of all students. Qatami (2005) also supports the idea that good learning atmosphere is conducive to develop the critical thinking skills in students. Thus, as the students are motivated to learn in an educational environment, they can then be guided to build their skills for evaluating and solving problems by utilizing the critical thinking skills.

2.8 Teachers' Role in the Development of Critical Thinking

The continuous need of teaching the critical thinking skills to students is all-pervading in the modern society. In an age of immense information and technology, there is yet an even bigger and urgent need for students to think critically. (Kong,2006).

McGuinness (1999) emphasizes that rote memorization has no place in today's modern education and high-quality education involves more than simple transference of facts and routine application of same old procedures. Thus, it is vital to make sure that the young learners can think independently, produce creative ideas and be able to solve unpredicted problems. But students are not expected to learn these skills on their own without being educated about them explicitly.

It is still debatable in educational research that whether students should learn to think critically on their own or should critical thinking be part of the curriculum. Thus, formally teaching students the critical thinking skills. Strenberg & Williams (2002) are of the view that thinking is a natural process thus it's not essential to specifically teach critically thinking to students. But Duron et al. (2006) argues that although thinking is a natural process but if thinking is left to itself, there is possibility of a biased, partial and narrow-minded aspect to it. Thus, quality in thinking must be nurtured. Kim et al., (2012) supports the same idea that teachers should cultivate the critical thinking skills in students so that students can think more effectually and creatively.

Thus, in such a setting, teachers play a key role in equipping the future generation with the most important tool of critical thinking skills to prepare them for the upcoming challenges in modern society. Loving & Wilson (2000) also emphasizes that the modern era teachers are highly expected to cultivate student's critical thinking. In doing so, teachers must have a grasp over the subject content knowledge along with "conceptual, strategic, epistemological and educational implications of critical thinking."(Mangena & Chabeli,2005).Research depicts that the more explicitly the critically thinking is taught, the more students will learn the thinking process and its application.(Swartz & Parks, 1994). McGuinness(1999) also supports the idea that teachers should focus on the critical thinking skills in the class room teaching as it leads to better and comprehensive learning. Underbakke, Borg & Peterson, (1993) emphasizes that the teachers' teaching method play a key part in the student's knowledge development. Thus, when the critical thinking skills are embedded in the teacher's lesson plans, learners acquire a more deep and meaningful understanding of the subject taught. Various teaching strategies are utilized to foster critical thinking in students. Laurer (2005) emphasizes that critical thinking is important to develop skills for academic as well as lifelong learning to evaluate and solve problems. Teachers play a

major role in developing teaching strategies that enhances student's critical thinking skills. Following general teaching strategies should be applied in the classroom to develop critical thinking skills among students:

2.9 Group Discussion to Promote Critical Thinking

Group discussion is a very effective teaching strategy to attract the attention of the students where students can relate to other students and teacher effectively. Flore & Hurjui (2014) emphasizes that teachers conduct group discussions in the class to foster critical thinking among students. Group discussion is a learning method in which students work together in small groups refer to as the "circle of knowledge "to discuss the content collaboratively to attain an academic goal. Burke (2011) emphasizes that the main advantage of the group discussion is that it gives opportunity to students to share and develop knowledge as well as inspire creativity and student's understanding. Research has shown that the there is a positive relationship between the collaborative work and student's capability to learn. (Karami et al., 2012). Nelson (1994) also supports the idea that collaborative method of learning develops more critical thinking as compared to individual learning. Fung & Leung (2016) supports the idea that group work is more valuable in develop student's critical thinking.

Teacher also play a very important role in the group discussion by producing a learning environment of freedom and guidance. Shinzato (1999) supports the idea that teachers should be facilitator during group discussion by encouraging students to participate in sharing knowledge and developing critical thinking skills. Group discussions motivates students to respect other student's point of view and thinking critically about their views also it helps students to analyze, evaluate and solve problems.

2.10 Problem based Learning

Problem based learning is a student-centered learning in which the students learn through the facilitated problem solving in that way students can learn the content as well as the thinking strategies. In problem-based learning, students focus on the complex problem that does not have single correct answer. Students involve in self -directed learning and apply their newly learned knowledge to solve the problem and to reflect on their learning. (Barrows & Kelson1995). In problem-based learning, the role of teacher is of facilitator rather than the provider of knowledge.

Problem based learning is an outstanding teaching strategy as it allows the students to analyze and solve the problem from different angles. In PBL, students learn and apply the problem-solving skills that prepares them for the future problem and challenges of life. Cromley (2000) supports the idea that problem-based learning techniques teaches the students to think critically as compared to non-problem-based learning. Ritchhart & Perkins (2005) emphasizes that problem solving skills enhances critical thinking skills as motivate students to effectively utilize the knowledge and data to solve problems. Thus, problem-based learning helps the students to develop critical thinking skills to analyze and solve problems thus promoting life-long learning.

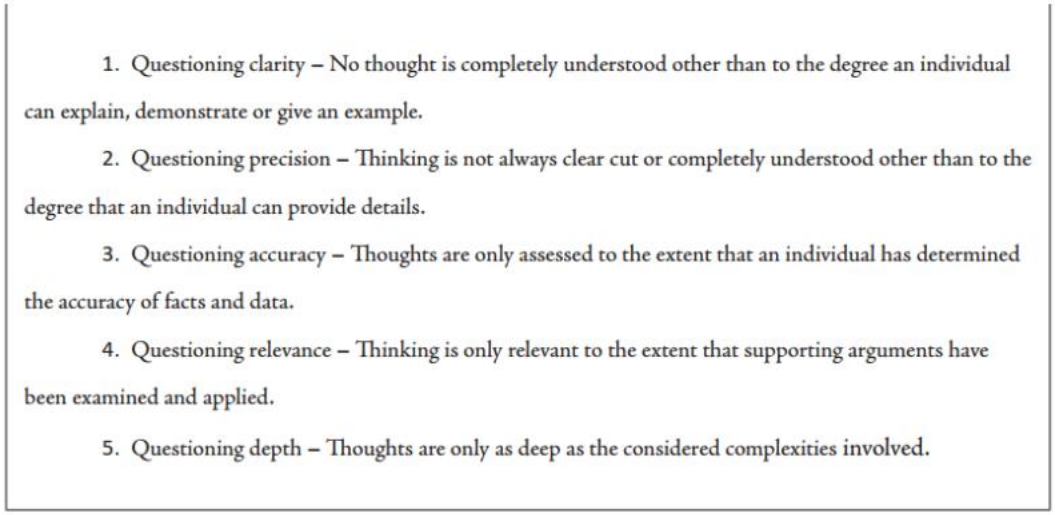
2.11 Importance of Questioning in Fostering Critical Thinking

Questioning plays vital role in the teaching and learning process and should be included in good quality teaching strategies. Questioning paly major role not only in teaching but also in evaluating student's comprehension of the subject. But not all the questions are of the same level. Thus, for the questions to be more useful and purposeful, teachers should develop well-structured higher order thinking questions to stimulate critical thinking among students. Lewis (2015). emphasizes that questioning is a crucial part of the effective teaching. Peterson &Taylor (2012) supports the idea that students and teachers both will get advantage from the well-structured higher order thinking questions as students will develop the aptitude to build connections to the former knowledge as well as to apply it in the new real-world situations. Higher order thinking questioning foster student's ability to think critically while the lower order thinking questions usually need students to recall the previous information. Tienken et al (2010) emphasizes that lower order thinking questions do not motivate students to think critically and creatively.

Greek philosopher, Socrates spent valuable time in developing thoughtful and well-organized questions about people's views thus motivating students to evaluate the previous knowledge and information and to construct new knowledge based on more scholarly and strong beliefs. In today's world, the teachers utilizing the Socratic approach of questioning are basically not searching for an exact correct answer but motivating students to reflect on their thoughts

Peterson & Taylor (2012) also supports the idea that higher order questioning that comprise of analyzing, synthesizing, evaluating and applying the information are very beneficial for the students learning. Usually, the higher order thinking questions do not have one single exact answer, but it inspires the students to be involved in critical thinking. Lundy (2008) supports the idea that higher order thinking questions are important for effective student's learning. Lewis (2015) emphasizes

that higher level thinking questions allow teachers to have a broader view of the student's comprehension of the subject. To develop a deeper understanding of the content ,teachers must endeavor to develop higher order thinking questions instead of lower level thinking questions as it will help the students to develop association between prior learning and applying it in new scenarios enhancing critical thinking .Elder & Paul(2009)emphasizes that there is connection between the questioning and the higher order thinking skills like critical thinking. Paul & Elder (2009) further explains that questions motivate the student's thinking process and that leads to the generation of more questions. If the answers to question does not produce more questions, then the thought process will come to stand still. As quality questioning is linked to problem solving, thus leading to quality problem solving. In exploring the connection between critical thinking and Socratic questioning, Elder & Paul (2009) developed Socratic questioning taxonomy to develop and evaluate quality of thinking.



1. Questioning clarity – No thought is completely understood other than to the degree an individual can explain, demonstrate or give an example.
2. Questioning precision – Thinking is not always clear cut or completely understood other than to the degree that an individual can provide details.
3. Questioning accuracy – Thoughts are only assessed to the extent that an individual has determined the accuracy of facts and data.
4. Questioning relevance – Thinking is only relevant to the extent that supporting arguments have been examined and applied.
5. Questioning depth – Thoughts are only as deep as the considered complexities involved.

Fig 2. Elder & Paul (2007), Socratic Questioning Taxonomy.

In the Figure 2. Paul &Elder (2009) emphasizes that the teachers should adopt Socratic questioning to develop critical thinking among students as well as to motivate them towards well-organized and self-directed questioning.

2.12 Metacognition

Metacognition is derived from the Greek word "meta" meaning beyond and the Latin word" cognoscere" meaning "getting to know". In the modern world, metacognition refer to" thinking about thinking". Metacognition is basically the ability to critically analyze and reflect on one's

thinking. Developing metacognitive skills in students motivates the students to become more resilient and independent learner. It enhances student's self-awareness which plays a vital role in student's learning as student become more aware of what they still need to learn.

One of the ways to enhance student's metacognitive skill is to design high quality questions where students are encouraged to think about their own thinking. Aram &Davis (2005) supports the idea that effective high order questions promotes student's motivation and interest in the content subject. Lewin (2010) emphasizes that metacognitive skills should be embedded into the curriculum as it enhances student's comprehension and learning of the subject. Teachers can develop critical thinking skills in students by stopping intermittently, explaining their thinking process and then asking higher order thinking questions (Fordham,2006).Zimmerman (2002) emphasizes that learners who can apply the metacognition to the learning can enhance the deep understanding of the subject as they are well prepared to connect to the previous experiences. Thus, metacognition is a valued and complex skill that can develop student's knowledge and their self-awareness of the process of learning.

Chapter 3: Methodology

The primary aim of this section is to deliver a framework to learn about methodology design for the research which has been used by the writer trying to understand if private school in Dubai are applying critical thinking skills in their teaching strategies and whether classroom environment is conducive to develop critical thinking among students.. Along with that the research aim to explore various teaching techniques and strategies utilize by the teachers in private school in Dubai to develop critical thinking among students. The results attained from the research will be used to recommend how to further develop and increase teaching and learning in private schools to enhance student's higher order thinking thus preparing them for the future

This chapter of the research specifies the research approach taken up followed by the research method utilized for the study. Further explaining the context of the study along with detailed explanation of the research instrument, site and participants. Finally, the ethical considerations and consents are discussed. Research methodology is the process of gathering, analyzing, and interpreting the collected data to fully comprehend a phenomenon. (Leedy & Ormord,2001). Gronhaug & Ghauri (2002) explain that the research methodology refers to organized and focused gathering of data to reach the aim of the research.

3.1 Research Design

The researcher has followed the exploratory sequential mixed method approach which basically comprise of two parts: The first part consists of collection of quantitative data by teacher and student questionnaires to find out the student's and teacher's views about the critical thinking. The second part of the research comprise of class observations to collect the qualitative data to research about the critical thinking strategies and methods utilize by the teachers' in the classroom to foster critical thinking. Mix method approach in the research is gaining more popularity and is increasingly being used by many researchers (Cresswell,2007). This study conforms with the post-positivist constructivist philosophy that highlights that though values, background and the prior knowledge of the investigator all contribute towards the roots of the research but the external reality of the research should be independent of the values of the researcher. In the first phase the student and teacher's surveys are utilized to research about the teaching strategies and methods to foster critical thinking among students. In the second phase, various classroom observations are manifested to investigate and confirm actual teaching strategies and methods utilized by teachers to cultivate the critical thinking among students.

Mix method research designs are described as constructivist or naturalistic inquiry (Cresswell,2009). Although the mix method approach to research involves extra time and effort as researcher need to gather and analyze two types of data (Creswell ,2007). Along with that, for the mix method approach, the researcher should be expert in the knowledge of both quantitative and qualitative research methods. But, in spite of that, mix method approach add value to the research by enhancing the validity of the study and help in the knowledge production. Peltomaki & Nummela (2006) argues that mix method approach gives a deeper and wide-range comprehension of the phenomenon under study.). For the quires, which are not answered and illustrated properly, the mixed approach is an appropriate method to investigate the findings and to extract the insights (Karami et al., 2003). Thus, the results and outcome from the mixed methods are more advantageous and reliable at any stage to compare the results because qualitative techniques are fully supported by the data taken through the quantitative methods (Scandaura, 2000).Cressell (2014) also supports the idea that mix method approach is particularly useful in the researches where utilizing qualitative or quantitative method alone would not give full comprehensive view of the research questions.

Exploratory sequential mix method approach combines the aspects of both the quantitative and the qualitative research methods. Creswell (2014) emphasizes that if the quantitative data collected missed out to have required explanation then it can be supported by the information gathered by the qualitative method to get a broader and clearer view point of the research under study.

3.2 Research Method

For the current research, the author has chosen the mix method approach to gather the information for the research as the mix method approach combines the strengths of both quantitative and qualitative research methods, thus, further enriching the data collection.

Mix method approach involves gathering and analyzing both the qualitative and quantitative data. Quantitative approach comprises of close-end information that leads to statistical analysis and is represented numerically whereas qualitative method is more open-ended and subjective and thus allow the participant's voice to be heard and meaningful analysis of the observations. Creswell & Planko (2007) emphasizes that both qualitative and quantitative researches have their own limitations and a mix method approach can counterbalance the weaknesses in the individual qualitative or quantitative approaches and hence leads to the enhancement of the depth and breadth of the exploration and analysis in the research. Thus, a mix method approach utilizes the strengths of both the qualitative and quantitative approaches to provide a comprehensive viewpoint of the issue. Widson (2013) emphasizes that the mix method approach leads to enriching the qualitative and quantitative data under one framework

For years, researchers were critic about the quantitative and qualitative approach to research. Nagel(1896)claims that the qualitative method of research is criticized for the lack of objectivity and the quantitative method is criticized for missing the voice of the participants and meaningful explanation of the collected data (Toomela,2008).Thus, many researchers are in favor of mix method approach due to certain deficiencies of quantitative and qualitative methods.

Also, in mix method approach there is more information that leads to hypothesis and promotes future research. Same idea is supported by Schulz (2003) that mix method approach gives more extensiveness, richness and depth to the research findings as compared to the individual qualitative or quantitative method. Creswell & Clark (2007) supports the same idea that the mix method approach of research provides a better and broader understanding of the subject matter than either of the quantitative or qualitative approaches alone. Thus, a combination of the two approaches that

arises from this study is likely to deeply explore the teaching and learning of critical thinking in the schools

3.3 Site, Sampling and Participants

The research was conducted in a private school in Dubai, UAE, which inspire critical thinking skills among their students. This study involves English, Science and Learning inquiry subject's teachers and 80 students of class 5^{th} and 6^{th} of similar subjects as a targeted population to meet the objectives and research questions. There are male and female mix in the sample for teachers and students as well. When comes to sampling, Convenience and Judgment sampling techniques are been utilized. Sampling is a very vital part of any research because of the important impact it can render on the quality of the research. Creswell (2004) emphasizes that research sample should be the representative of the target population to make sure that we can generalize the results of the research sample to the general population. Saunders et.al (2007) emphasizes that sampling is required in the research methods as it is not logically and economically possible to conduct consensus of the entire population due to resource constraints such as time, large population size, inaccessibility of the population etc. This study first highlights the different methods and strategies used in literature to collect the survey data employing the probability sampling approaches (Saunders, Lewis & Thornhill, 2007).

The research comprises of incorporating student surveys among 80 student of grade 5 & 6 in a private school in Dubai. The reason for choosing the students of Grade 5 & 6 is that the students at this age are supposed to develop their own point of view by responding to the teacher's directions through discussion and class activities. Teacher's questionnaire was also given to English, Science and Learning Inquiry subject teachers as teachers have more margin of incorporating critical thinking skills in the teaching strategies of these subjects.

3.4 Collecting primary data

In procedural methodology, the investigation and primary assessment was done to collect the primary data and information for the rest of the study (Creswell 2004). Questionnaires were distributed to the selected sample form the target population systematically in order to collect the quantitative data. At first student's questionnaires were distributed and data collected and then teacher's questionnaires were filled by the teacher. Qualitative data is collected through class observations which the researcher conducted as a silent observer ensuring not to distract student or

teacher's attention in the class. Observer questionnaire and at the end assessment reports were conducted.

3.5 Instrument of the Research

An integral part of the research design is the instrument used to gather the data. Instrument is a very important tool to measure the research studies. Current study has utilized questionnaire as the instrument of the research. Current study utilizes two types of questionnaire that is student's questionnaire and teacher's questionnaire. In student's questionnaire, normally the teaching techniques, strategy, which subject students like most and least, teacher's behavior, and encouragement from teacher's point of view were asked. Similarly, in teacher's questionnaire, teacher's critical thinking was asked through various different questions. What teacher does and what students do in the class were observed by means of different questions and quires, and at the end assessment reports were filled by observer.

Each questionnaire is designed with specific objectives and purpose in order to collect precise information from the sample respondents. McLeod (2018) emphasizes that the benefit of questionnaire is it leads to collection of the exact information. Answers attained from the questionnaire are further analyzed by utilizing various statistic methods to gain valuable information. (McLeod,2018).

Teacher's survey questionnaire is developed reflecting the skills mentioned in the ATL (Approaches to Learning)skills especially the Thinking skills(Critical thinking, Creative thinking).Survey includes 20 teaching practices and teachers were asked to answer how often they use the practices using a 5 point scale: Daily (every class day);Frequently (most class days); Sometimes (about half of class days); Occasionally (a few class days); and Not at all. Questionnaire consists of the close ended questions like "Demographic Question" such as age and gender etc. It is a vital part of the questionnaire as it helps the researcher to identify the factors that affect the research from their view point and interest. (Defranzo,2012). It has beneficial effect like easy to answer and also easy to compare and contrast from another research (Defranzo,2012).

The validity of the questionnaire was checked by the help of the expert in the field who advised to change some minor changes in the questionnaire to make it more appropriate to the related conditions. This also helped the researcher to reduce the drawback with respect to the full research and hence increase the validity of the research and make it more reliable.

3.6 Class Observations

The qualitative data for the research is collected through a series of Class observations done by the researcher in the English, Science and Learning Inquiry Classes. Each English, Science and Learning Inquiry subject class were observed four times. Before, observing the classes, the researcher was introduced to the teachers by the school. Researcher explained the research purpose to the teachers by explaining that the class observations are done to collect the data for the research. Class observations were done in the English, Science and Learning Inquiry classes of Grade 5& 6. Researcher conducted the class observations as a silent observer sitting at the back of the class in order not to disturb the attention of the teachers and students. Observer keenly observe the classes by utilizing the observation checklist comprising of teaching strategies used by the teachers and the student's learning methods. Observer also took detailed notes for the class observations in English, Science and Learning Inquiry classes to record teaching practices and student's learning. Class room observations is the useful tool for examining the teaching and learning process by collecting qualitative data and analysis(Bailey,2001).Through class observations, observer can effectively assess the classroom environment and the quality of teaching.(Wragg,1999).Thus, classroom observations also gives opportunity to the observer to evaluate the consistency between curriculum and the actual teaching material delivered by the teachers.(Wragg,1999).

3.7 Analysis of Data

Quantitative as well as qualitative data was gathered for the research under consideration. Therefore, different techniques are used to explore the findings to convert it into a meaning full information.

3.71 Quantitative data analysis

In order to meet the objectives of the research under examination, quantitative data was gathered through teacher and student questionnaires along with the class observation checklist. Collected data was analyzed by using SPSS (Statistics Package for Social Science Software) applying percentage analysis, descriptive analysis, chi-square test, and correlation analysis among variables. Different hypothesis also checked in order to highlight the differences in teaching strategies and teaching techniques among teachers. Data collected is arranged into tables to compare the teaching methods and strategies utilized by the teachers to foster critical thinking among students.

Percentage analysis

A percentage analysis is done for every question in order to split the information into more details for the sake of better understanding. Percentage analysis has been carried out as tables with percentage and gender wise group information.

Cronbach's alpha

The reliability is measured through the Cronbach's alpha by using SPSS software. The coefficient of it ranges between 0 to 1. The questions used in the questionnaire are considered more reliable as there is more high value of the Cronbach's Alpha coefficient. It is good in order to measure for all different scales used in the questionnaires.

Chi-Square Test

In order to check the differences in , teaching strategies for different subjects Chi-square test is used in SPSS. Chi-square test has a null hypothesis of equality of mean among different objects and alternative of not equal, and acceptance of the null hypothesis shows that there is no significant difference in the mean of the particular objects, while alternative hypothesis shows that there is a significant mean. The chi-square test statistics is measures and critical values is checked with the assistance of the degree of freedom. The null hypothesis accepted if test statistics is less than critical value or p-value is less than 0.05.

Pearson Correlation

In order to calculate the relationship between the teacher's strategies and students learning methods, Pearson correlation is carried out. It shows the linear relationship between variables with degree of association. The range of the coefficient lies between 0 to 1 with positive or negative sign. A positive coefficient value shows that both variables are positively linked with each other, with the increase or decrease in one variable the other variable is also increase or decrease and vice versa.

3.72 Qualitative data analysis

Qualitative data collected through classroom observations are also thoroughly analyzed and supported by the references from the view of literature. All the events that were observed during the class observations were documented and a checklist was then utilized to report the events related to the development of the critical thinking skills in the English, Science and Learning

Inquiry Classes. During the analysis of the qualitative data, open coding strategy is adopted to distinguish the various patterns in the collected data. Then, in-vivo codes are developed that represent the critical thinking strategies used in the class. Codes are then being categorized so as to include all the critical thinking teaching strategies. Coded excerpts are then studied in detail to further produce different themes about the critical thinking strategies observed during class observations.

Frequently used and effective teaching methods and strategies will be emphasized and compared with the researches that comes in the same frame of reference. Findings of the data collected will then be further discussed and recommendations are given on the findings.

3.8 Ethical Consideration

Prior to distribution of the survey to collect the data in first phase, the school's permission was attained, and a fixed time was allotted to distribute and fill the questionnaires from the students, teachers and as an observer. The environment was quite suitable and healthy for distributing and filling the questionnaire for respondents. At first a brief introduction, background and importance of the questionnaire's output, were given to the respondents for the sake of their sincere and consistent answering

Sound research is a moral and ethical effort thus it is of utmost importance to keep ethical consideration in the research. Creswell (2009) emphasizes that the ethics and morals should be the integral part of the research design. Thus, this study also keeps the ethical consideration at every step of the research by giving respect to the participants so that the study is highly reliable and fair. The letter was sent from British University in Dubai (Appendix 1) to the private school in Dubai, UAE to attain permission to conduct the research. It was ensured that the information collected by the researcher will be kept confidential and the identity of the participants in the research is also kept confidential. Participants were explained about the research purpose and the participants are given utmost importance in the study with the flexibility for the participants to leave the study at any time if they want. Bryman (2006) emphasizes that there are significant points in the ethics of the research that should always be considered such as ensuring complete consent from the participants, maintaining the participant's privacy making the study reliable.

Chapter 4: Results

4.1 Quantitative Results

In this chapter the preliminary and detail analysis of the data described. The quantitative data analysis has been used for the quantitative data gathered from the Private school in Dubai, UAE. The data collected through different questionnaires, which are characterized as students' questionnaires, teacher's critical thinking questionnaire, observation report and assessment. The data cleansing which include outlier and missing values are done in statistical package SPSS 21.0. Further rest of the estimation, which include frequency analysis, descriptive analysis, testing difference of mean through Chai-square test, Kruskal Wallis non-parametric test for comparing mean ranks and Spearman's rank correlation in order to check the relationship between students learning and teacher's learning methods.

4.11 Student Questionnaire

Table 1: Frequency for student's gender

Gender	Frequency	Percent
Male	42	52%
Female	38	48%
Total	80	100

Table 1 presents the frequency of respondents which show there are more male 52% (42) as compare to female 38 (48%) and total frequency of respondents is 80.

Table 2: Frequency for teaching strategy prefer

Teacher's Strategy	Options	frequency	Gender		Total
			Male	Female	
Which teaching strategy do you prefer?	The teacher to lecture while you are just listening	Count	4	7	11
		%	9.50%	18.40%	13.80%
	To participate in discussion and have activities	Count	38	31	69
		%	90.50%	81.60%	86.30%
Total		Count	42	38	80
		%	(100%)	(100%)	(100%)

Table 2 showed that which teacher's strategy students like most between "teacher lecture while you are just listening" and "to participate in discussion and have activities". The majority of students (69 out of 80) like "to participate in discussion and have activities" and among these students 38 are male and 31 are female.

Table 3: Frequency of teacher's encouraging students for asking questions

Question	Options	frequency	Gender		Total
			Male	Female	
Does the teacher encourage you to ask questions?	Yes	Count	30	23	53
		%	71.40%	60.50%	66.30%
	No	Count	1	0	1
		%	2.40%	0%	1.30%
	Sometimes	Count	11	15	26
		%	26.20%	39.50%	32.50%
Total		Count	42	38	80

	%	**(100%)**	**(100%)**	**(100%)**

In above Table 3, the frequency of respondents for "Does the teacher encourage you to ask questions?" depicted. It shows that majority 63% respondents' response positively and among them males and females are 30 and 23 respectively. While only 26% response negatively and among them 11 and 15 are males and females respectively. Further Table 3 shows that 32.5% have responses sometimes and among them 11 are males and 15 are females.

Table 4: How students' study for exams

Question	**Options**	**frequency**	**Gender**		**Total**
			Male	**Female**	
How do you study for the exams?	**Memorize all the textbook contents, questions and answers**	**Count**	14	3	17
		%	33.30%	7.90%	21.30%
	Understand the lessons/textbook to write using your own words	**Count**	25	29	54
		%	59.50%	76.30%	67.50%
	Other	**Count**	3	6	9
		%	7.10%	15.80%	11.30%
Total		**Count**	42	38	80
		%	**(100%)**	**(100%)**	**(100%)**

In above Table 4, it is depicted that how students' study for exams. Majority 67.5 % (54) of students use to "understand the lessons/textbook to write using your own words" strategy for exams preparation. And 21.30% (17) students use to "memorize all the textbook contents, questions and answers".

Table 5: Frequency of students who share their points of view

Question	Options	frequency	Gender		Total
			Male	Female	
Do you share your points of view with your teacher?	**Yes**	**Count**	27	25	52
		%	64.30%	65.80%	65%
	No	**Count**	0	1	1
		%	0%	2.60%	1.30%
	Sometimes	**Count**	15	12	27
		%	35.70%	31.60%	33.80%
Total		**Count**	42	38	80
		%	**(100%)**	**(100%)**	**(100%)**

In above Table 5, the frequency of respondents who share their point of view with teacher is given. It shows that 65% (52) of students use to share their point of view and among them 27 are male and 25 are female. Further 33.8% (27) students are those who sometimes share their point of view with teacher and among them mostly are male (15) as compare to female (12). And, only 1.3% (1) of students don't use to share their point of view with teacher.

Table 6: Frequency of students who have problems in understanding lecture

Question	Options	frequency	Gender		Total
			Male	Female	
If you have a problem to understand a point in the lesson, would you?	**Ask the teachers questions to explain it for you**	**Count**	30	23	53
		%	71.40%	60.50%	66.30%
	Memorize it as it is	**Count**	2	3	5
		%	4.80%	7.90%	6.30%
	Ask your friend/someone later to explain it for you	**Count**	10	10	20
		%	23.80%	26.30%	25%
	Other	**Count**	0	1	1
		%	0%	2.60%	1.30%
Total		**Count**	**42**	**38**	**80**

	%	**(100%)**	**(100%)**	**(100%)**

Above in Table 6, frequency of respondents who have problem to understand lesson has described. It shows that 66.30% (53) respondents when have any problem in order to understand the lesson they ask question to the teacher to explain it for them. In addition, among these respondents, 30 are male and 23 are female. Next 6.30% (5) respondents memorize it as it is and do not ask question to the teacher.

Table 7: frequency of students for subject likeness

Question	**Options**	**frequency**	**Gender**		**Total**
			Male	**Female**	
What is your favorite lesson?	**Math**	**Count**	23	23	46
		%	54.80%	60.50%	57.50%
	English	**Count**	5	5	10
		%	11.90%	13.20%	12.50%
	Science	**Count**	14	10	24
		%	33.30%	26.30%	30%
Total		**Count**	**42**	**38**	**80**
		%	**(100%)**	**(100%)**	**(100%)**

In Table 7, the frequency of respondents given for favorite lesson for three different subjects. It shows that 57.50% (46) of respondents like Math subject, and among these respondents, 23 are male and 23 are female. Secondly, a proportion of 30% (24) of respondents like English and among these 14 are male and 10 are female. Only 12.5% (10) like Science subject and among these respondents 5 are male and equally female.

Table 8: Frequency of students for subject of least preference

Question	Option	frequency	Gender		Total
			Male	Female	
Which lesson do you like the least?	**Math**	**Count**	10	9	19
		%	23.80%	23.70%	23.80%
	English	**Count**	17	11	28
		%	40.50%	28.90%	35%
	Science	**Count**	15	18	33
		%	35.70%	47.40%	41.30%
Total		**Count**	**42**	**38**	**80**
		%	**(100%)**	**(100%)**	**(100%)**

Above in Table 8, frequency of least preference lesson of respondents is given. Table 8 reveals that 41% (33) respondents dive least likeness to Science subject. In addition, among these respondents, 15 are male and 18 are female. Next 35% (28) respondents give least likeness to English subject, in this proportion, 17 are male and 11 are female. Lastly, 23.8% (19) respondents give least likeness to Math subject. Moreover, it includes 10 male and 9 female respondents.

Table 9: Frequency of students for asking questions to understand lecture

Question	Option	frequency	Gender		Total
			Male	Female	
Do you frequently ask questions about something you did not understand in the lesson?	**Yes**	**Count**	35	32	67
		%	83.30%	84.20%	83.80%
	No	**Count**	7	6	13
		%	16.70%	15.80%	16.30%
Total		**Count**	**42**	**38**	**80**
		%	**(100%)**	**(100%)**	**(100%)**

In above Table 9, frequency of those respondents who frequently ask questions about something, which they didn't understand, have given. It shows that 83.8% (67) of respondents frequently ask

questions if they didn't understand anything in the lesson. Moreover, in this percentage 35 are male and 32 are female respondents. Only 16.3% (13) respondents didn't use to ask frequently question when they didn't understand anything in the lesson.

Table 10: Frequency of students who are encouraged for participation in discussion

Question	Option	frequency	Gender		Total
			Male	Female	
Do your teachers encourage you to participate in discussions?	**Yes**	**Count**	30	21	51
		%	71.40%	55.30%	63.80%
	No	**Count**	0	3	3
		%	0%	7.90%	3.80%
	Sometimes	**Count**	12	14	26
		%	28.60%	36.80%	32.50%
Total		**Count**	**42**	**38**	**80**
		%	**(100%)**	**(100%)**	**(100%)**

Above in Table 10, frequency of those students who are encouraged over participation is given. It shows that 63.8% (51) respondents positively reply means they are encouraged for participation in discussion and in this proportion, 30 are male and 21 are female. In addition, 32.5% (26) respondents say that sometimes they are encouraged and in this percentage 12 are male and 14 are female. While only 3.8% (3) respondents reply in negative means that they are not encouraged for participation in discussion.

Table 11: Frequency of students who are asked to study for

Question	Option	frequency	Gender		Total
			Male	Female	
Did your teacher(s) ask you to study for the exam(s)?	**To get high grades**	**Count**	12	7	19
		%	28.60%	18.40%	23.80%
	To enhance your critical thinking skills	**Count**	24	24	48
		%	57.10%	63.20%	60%
	Other	**Count**	6	7	13
		%	14.30%	18.40%	16.30%

Total	**Count**	42	38	80
	%	**(100%)**	**(100%)**	**(100%)**

In above Table 11, 23.8% (19) respondents say that they are asked by their teacher to study to get high grades and in this proportion 12 are male and 7 are female. In addition, 60% (48) respondents say that they are asked to study to enhance their critical thinking skills by their teacher and in this proportion male and female are equal.

Table 12: Frequency of students having different advises by teachers

Question	**Option**	**frequency**	**Gender**		**Total**
			Male	**Female**	
The teacher depend that you will	**Memorize and recall information**	**Count**	4	6	10
		%	9.50%	15.80%	12.50%
	Understand, think for yourself and solve problems by your own	**Count**	33	27	60
		%	78.60%	71.10%	75%
	Other	**Count**	5	5	10
		%	11.90%	13.20%	12.50%
Total		**Count**	**42**	**38**	**80**
		%	**(100%)**	**(100%)**	**(100%)**

In above Table 12, frequency of respondents has given who are given different advises by their teacher. A high proportion 75% (60) of respondents say that they are told by their teacher that they "understand, think for yourself and solve problems by your own" and in this proportion 33 are male and 27 are female. In addition, 12.5% (10) say they are told to memorize and recall information.

Table 13: Frequency of students who are prepared for university

Question	Option	frequency	Gender		Total
			Male	Female	
Does school prepare you to study in the university?	**Yes**	**Count**	30	22	52
		%	71.40%	57.90%	65%
	No	**Count**	3	3	6
		%	7.10%	7.90%	7.50%
	Sort of	**Count**	9	13	22
		%	21.40%	34.20%	27.50%
Total		**Count**	**42**	**38**	**80**
		%	**(100%)**	**(100%)**	**(100%)**

In above Table 13, frequency of respondents has given in context whether school prepare them to study at university level. Majority of respondents 65% (52) gave a positive answer. They think that this school prepare them to study at university level. Only 7.5% (6) respondents answer negatively.

Table 14: Frequency of teacher strategy which students prefer most during lesson

Question	Option	frequency	Gender		Total
			Male	Female	
Your teacher uses the following teaching strategy	**Lecturing and talking**	**Count**	11	11	22
		%	26.20%	28.90%	27.50%
	Discussing and facilitating	**Count**	25	23	48
		%	59.50%	60.50%	60%

	Other	**Count**	6	4	10
		%	14.30%	10.50%	12.50%
Total		**Count**	**42**	**38**	**80**
		%	**(100%)**	**(100%)**	**(100%)**

Above in Table 14, frequency of teacher strategy, which respondents prefer most during lesson, has given. It shows that 60% (48) respondents answered "Discussing and facilitating" is the strategy they preferred most. In addition, 27% (22) answered "Lecturing and talking" is the best teacher strategy.

Table 15: Frequency of students comment for improvements

Question	**Option**	**frequency**	**Gender**		**Total**
			Male	**Female**	
What are your comments regarding teaching strategies in Private Schools and what are your suggestions for further improvement	**Good**	**Count**	36	36	72
		%	85.70%	94.70%	90%
	Not Good	**Count**	1	1	2
		%	2.40%	2.60%	2.50%
	No comment	**Count**	5	1	6
		%	11.90%	2.60%	7.50%
Total		**Count**	**42**	**38**	**80**
		%	**(100%)**	**(100%)**	**(100%)**

In above Table 15, frequency of respondent's comments for improvements has given. It shows that 90% (72) respondents answered "Good" and only 2% comment "Not good"

4.12 Teacher Questionnaires

Descriptive Statistics								
	N	Range	Minimum	Maximum	Mean		Std. Deviation	Variance
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
Gender	23	1.00	1.00	2.00	1.6087	.10405	.49901	.249
Age	23	1.00	1.00	2.00	1.3478	.10154	.48698	.237
N	23							

In the table above, descriptive statistics are given for gender and age. It shows that mean age is 1.61 which is approximately equal to 2, and two is coded for the second age group 35-44 option. So, the mean age of respondents is 35-44 with a slightly deviation of 0.24. Similarly, for gender, approximate mean is 2 which shows mostly are females in respondents.

Table 16					
					Total
			20-34	35-44	
Please specify your gender	Male	Count	7	2	9
		% of Total	30.4%	8.7%	39.1%
	Female	Count	8	6	14
		% of Total	34.8%	26.1%	60.9%
Total		Count	15	8	23
		% of Total	65.2%	34.8%	100.0%

Table 17: During lessons, teacher present questions for discussion that have no clear right or wrong answers

							Total
			Daily (Every class day)	**Frequently (most class days)**	**Sometimes (about half of class)**	**Occasionally (a few class)**	
Please specify your gender	Male	Count	5	2	1	1	9
		% of Total	21.7%	8.7%	4.3%	4.3%	39.1%
	Female	Count	7	1	1	5	14
		% of Total	30.4%	4.3%	4.3%	21.7%	60.9%
Total		Count	12	3	2	6	23
		% of Total	52.2%	13.0%	8.7%	26.1%	100.0%

In above Table, respondent's answers are presented in form of counts and percentage out of total. The figure shows two dimensions, one is count and another is percentage out of total in order to comprehend the overall information. The respondents are characterized into two categories 'Male' and 'Female'. Mostly replied for 'Daily (Every class day)' as can be seen by the high percentage rate out of total in Table and figure as well. Similarly, majority avoided the answer 'Occasionally (a few class)' as can be seen from the table and figure showing a few count and very low percentage.

Table 18: Teacher asked students to explain their answers					
			Daily (Every class day)	Frequently (most class days)	Total
Please specify your gender	Male	Count	8	1	9
		% of Total	34.8%	4.3%	39.1%
	Female	Count	9	5	14
		% of Total	39.1%	21.7%	60.9%
Total		Count	17	6	23
		% of Total	73.9%	26.1%	100.0 %

In above Table, respondent's answers are presented in form of counts and percentage out of total. The figure shows two dimensions, one is count and another is percentage out of total in order to comprehend the overall information. The respondents are characterized into two categories 'Male' and 'Female'. Mostly replied for 'Daily (Every class day)' as can be seen by the high percentage rate out of total in Table and figure as well. Similarly, majority avoided the answer 'Occasionally (a few class)' as can be seen from the table and figure showing a few count and very low percentage.

Table 19: Ask students to develop opposing or corresponding arguments							
							Total
			Daily (Every class day)	**Frequently (most class days)**	**Sometimes (about half of class)**	**Occasionally (a few class)**	
Please specify your gender	Male	Count	3	2	3	1	9
		% of Total	13.0%	8.7%	13.0%	4.3%	39.1%
	Female	Count	5	6	1	2	14
		% of Total	21.7%	26.1%	4.3%	8.7%	60.9%
Total		Count	8	8	4	3	23
		% of Total	34.8%	34.8%	17.4%	13.0%	100.0 %

Table 20: Ask students to share their work with others for reflection and improvement						
			Daily (Every class day)	**Frequently (most class days)**	**Sometimes (about half of class)**	**Total**
Please specify your gender	Male	Count	**6**	**1**	**2**	9
		% of Total	26.1%	4.3%	8.7%	39.1%
	Female	Count	5	7	2	14
		% of Total	21.7%	30.4%	8.7%	60.9%
Total		Count	11	8	4	23

	% of Total	47.8%	34.8%	17.4%	100.0%

In above Table, respondent's answers are presented in form of counts and percentage out of total. The figure shows two dimensions, one is count and another is percentage out of total in order to comprehend the overall information. The respondents are characterized into two categories 'Male' and 'Female'. Mostly replied for 'Daily (Every class day)' as can be seen by the high percentage rate out of total in Table and figure as well. Similarly, majority avoided the answer 'Occasionally (a few class)' as can be seen from the table and figure showing a few count and very low percentage.

Table 21: Use brainstorming, as a class or among groups of students, to produce new ideas

			Daily (Every class day)	**Frequently (most class days)**	**Sometimes (about half of class)**	**Occasionally (a few class)**	Total
Please specify your gender	Male	Count	4	3	0	2	9
		% of Total	17.4%	13.0%	0.0%	8.7%	39.1%
	Female	Count	8	5	1	0	14
		% of Total	34.8%	21.7%	4.3%	0.0%	60.9%
Total		Count	12	8	1	2	23
		% of Total	52.2%	34.8%	4.3%	8.7%	100.0 %

In above Table, respondent's answers are presented in form of counts and percentage out of total. The figure shows two dimensions, one is count and another is percentage out of total in order to comprehend the overall information. The respondents are characterized into two categories 'Male'

and ‘Female’. Mostly replied for ‘Daily (Every class day)’ as can be seen by the high percentage rate out of total in Table and figure as well. Similarly, majority avoided the answer ‘Occasionally (a few class)’ as can be seen from the table and figure showing a few count and very low percentage.

Table 22: Accept all students valid responses

			Daily (Every class day)	**Frequently (most class days)**	**Sometimes (about half of class)**	**Total**
Please specify your gender	Male	Count	8	1	0	9
		% of Total	34.8%	4.3%	0.0%	39.1%
	Female	Count	9	4	1	14
		% of Total	39.1%	17.4%	4.3%	60.9%
Total		Count	17	5	1	23
		% of Total	73.9%	21.7%	4.3%	100.0%

In above Table, respondent’s answers are presented in form of counts and percentage out of total. The figure shows two dimensions, one is count and another is percentage out of total in order to comprehend the overall information. The respondents are characterized into two categories ‘Male’ and ‘Female’. Mostly replied for ‘Daily (Every class day)’ as can be seen by the high percentage rate out of total in Table and figure as well. Similarly, majority avoided the answer ‘Occasionally (a few class)’ as can be seen from the table and figure showing a few count and very low percentage.

Table 23: Incorrect student respond elicit encouraging, supportive comment.							
			Daily (Every class day)	Frequently (most class days)	Sometimes (about half of class)	11.00	Total
Please specify your gender	Male	Count	6	1	1	0	8
		% of Total	28.6%	4.8%	4.8%	0.0%	38.1 %
	Female	Count	7	3	2	1	13
		% of Total	33.3%	14.3%	9.5%	4.8%	61.9 %
Total		Count	13	4	3	1	21
		% of Total	61.9%	19.0%	14.3%	4.8%	100.0 %

In above Table and figure, respondent's answers are presented in form of counts and percentage out of total. The figure shows two dimensions, one is count and another is percentage out of total in order to comprehend the overall information. The respondents are characterized into two categories 'Male' and 'Female'. Mostly replied for 'Daily (Every class day)' as can be seen by the high percentage rate out of total in Table and figure as well. Similarly, majority avoided the answer 'Occasionally (a few class)' as can be seen from the table and figure showing a few count and very low percentage.

Table 23: Ask students to share their work with the class							
			Daily (Every class day)	Frequently (most class days)	Sometimes (about half of class)	Occasionally (a few class)	Total
Please specify your gender	Male	Count	3	3	1	1	8
		% of Total	13.6%	13.6%	4.5%	4.5%	36.4%
	Female	Count	7	5	2	0	14
		% of Total	31.8%	22.7%	9.1%	0.0%	63.6%
Total		Count	10	8	3	1	22
		% of Total	45.5%	36.4%	13.6%	4.5%	100.0%

In above Table, respondent's answers are presented in form of counts and percentage out of total. The figure shows two dimensions, one is count and another is percentage out of total in order to comprehend the overall information. The respondents are characterized into two categories 'Male' and 'Female'. Mostly replied for 'Daily (Every class day)' as can be seen by the high percentage rate out of total in Table and figure as well. Similarly, majority avoided the answer 'Occasionally (a few class)' as can be seen from the table and figure showing a few count and very low percentage.

Table 24: Use models or visuals to represent complex ideas

			Daily (Every class day)	Frequently (most class days)	Sometimes (about half of class)	Occasionally (a few class)	Total
Please specify your gender	Male	Count	4	3	0	1	8
		% of Total	18.2%	13.6%	0.0%	4.5%	36.4%
	Female	Count	10	3	1	0	14
		% of Total	45.5%	13.6%	4.5%	0.0%	63.6%
Total		Count	14	6	1	1	22
		% of Total	63.6%	27.3%	4.5%	4.5%	100.0 %

In above Table, respondent's answers are presented in form of counts and percentage out of total. The figure shows two dimensions, one is count and another is percentage out of total in order to comprehend the overall information. The respondents are characterized into two categories 'Male' and 'Female'. Mostly replied for 'Daily (Every class day)' as can be seen by the high percentage rate out of total in Table and figure as well. Similarly, majority avoided the answer 'Occasionally (a few class)' as can be seen from the table and figure showing a few count and very low percentage.

Table 25: Discuss significance of the lesson-personally, locally, nationally or globally							
			Daily (Every class day)	Frequently (most class days)	Sometimes (about half of class)	Occasionally (a few class)	Total
Please specify your gender	Male	Count	4	1	2	1	8
		% of Total	18.2%	4.5%	9.1%	4.5%	36.4%
	Female	Count	8	5	1	0	14
		% of Total	36.4%	22.7%	4.5%	0.0%	63.6%
Total		Count	12	6	3	1	22
		% of Total	54.5%	27.3%	13.6%	4.5%	100.0%

In above Table, respondent's answers are presented in form of counts and percentage out of total. The figure shows two dimensions, one is count and another is percentage out of total in order to comprehend the overall information. The respondents are characterized into two categories 'Male' and 'Female'. Mostly replied for 'Daily (Every class day)' as can be seen by the high percentage rate out of total in Table and figure as well. Similarly, majority avoided the answer 'Occasionally (a few class)' as can be seen from the table and figure showing a few count and very low percentage

Table 26: Encourage transfer of cognitive skills to everyday life with comments like "this will help you in everyday life in this way"								
			Daily (Every class day)	Frequently (most class days)	Sometimes (about half of class)	Occasionally (a few class)	Not at all	Total
Please specify your gender	Male	Count	3	3	0	1	1	8
		% of Total	13.6%	13.6%	0.0%	4.5%	4.5%	36.4%
	Female	Count	8	5	1	0	0	14
		% of Total	36.4%	22.7%	4.5%	0.0%	0.0%	63.6%
Total		Count	11	8	1	1	1	22
		% of Total	50.0%	36.4%	4.5%	4.5%	4.5%	100.0 %

In above Table, respondent's answers are presented in form of counts and percentage out of total. The figure shows two dimensions, one is count and another is percentage out of total in order to comprehend the overall information. The respondents are characterized into two categories 'Male' and 'Female'. Mostly replied for 'Daily (Every class day)' as can be seen by the high percentage rate out of total in Table and figure as well. Similarly, majority avoided the answer 'Occasionally (a few class)' as can be seen from the table and figure showing a few count and very low percentage

Table 27: Solicit multiple and diverse points of view about a question or issue

			Daily (Every class day)	Frequently (most class days)	Sometimes (about half of class)	Occasionally (a few class)	Total
Please specify your gender	Male	Count	3	3	1	1	8
		% of Total	14.3%	14.3%	4.8%	4.8%	38.1%
	Female	Count	7	4	2	0	13
		% of Total	33.3%	19.0%	9.5%	0.0%	61.9%
Total		Count	10	7	3	1	21
		% of Total	47.6%	33.3%	14.3%	4.8%	100.0 %

In above Table and figure, respondent's answers are presented in form of counts and percentage out of total. The figure shows two dimensions, one is count and another is percentage out of total in order to comprehend the overall information. The respondents are characterized into two categories 'Male' and 'Female'. Mostly replied for 'Daily (Every class day)' as can be seen by the high percentage rate out of total in Table and figure as well. Similarly, majority avoided the answer 'Occasionally (a few class)' as can be seen from the table and figure showing a few count and very low percentage.

Table 28: Encourage students to use existing knowledge to generate new ideas or solve an unfamiliar problem

			Daily (Every class day)	Frequently (most class days)	Sometimes (about half of class)	Total
Please specify your gender	Male	Count	7	1	0	8
		% of Total	33.3%	4.8%	0.0%	38.1%
	Female	Count	7	5	1	13
		% of Total	33.3%	23.8%	4.8%	61.9%
Total		Count	14	6	1	21
		% of Total	66.7%	28.6%	4.8%	100.0%

In above Table, respondent's answers are presented in form of counts and percentage out of total. The figure shows two dimensions, one is count and another is percentage out of total in order to comprehend the overall information. The respondents are characterized into two categories 'Male' and 'Female'. Mostly replied for 'Daily (Every class day)' as can be seen by the high percentage rate out of total in Table and figure as well. Similarly, majority avoided the answer 'Occasionally (a few class)' as can be seen from the table and figure showing a few count and very low percentage.

Table 29: Teacher ask to clarify and justify response						
			Daily (Every class day)	Frequently (most class days)	Sometimes (about half of class)	Total
Please specify your gender	Male	Count	6	2	0	8
		% of Total	27.3%	9.1%	0.0%	36.4%
	Female	Count	7	6	1	14
		% of Total	31.8%	27.3%	4.5%	63.6%
Total		Count	13	8	1	22
		% of Total	59.1%	36.4%	4.5%	100.0%

In above Table, respondent's answers are presented in form of counts and percentage out of total. The figure shows two dimensions, one is count and another is percentage out of total in order to comprehend the overall information. The respondents are characterized into two categories 'Male' and 'Female'. Mostly replied for 'Daily (Every class day)' as can be seen by the high percentage rate out of total in Table and figure as well. Similarly, majority avoided the answer 'Occasionally (a few class)' as can be seen from the table and figure showing a few count and very low percentag

Table 30: Teacher withholds correct response and encourages students to explore possibilities

			Daily (Every class day)	Frequently (most class days)	Sometimes (about half of class)	Occasionally (a few class)	Total
Please specify your gender	Male	Count	4	3	0	1	8
		% of Total	18.2%	13.6%	0.0%	4.5%	36.4%
	Female	Count	7	4	2	1	14
		% of Total	31.8%	18.2%	9.1%	4.5%	63.6%
Total		Count	11	7	2	2	22
		% of Total	50.0%	31.8%	9.1%	9.1%	100.0%

In above Table, respondent's answers are presented in form of counts and percentage out of total. The figure shows two dimensions, one is count and another is percentage out of total in order to comprehend the overall information. The respondents are characterized into two categories 'Male' and 'Female'. Mostly replied for 'Daily (Every class day)' as can be seen by the high percentage rate out of total in Table and figure as well. Similarly, majority avoided the answer 'Occasionally (a few class)' as can be seen from the table and figure showing a few count and very low percentage.

Table 31: Help students break down complex concepts or problems into their component parts

			Daily (Every class day)	Frequently (most class days)	Sometimes (about half of class)	Occasionally (a few class)	Total
Please specify your gender	Male	Count	6	0	0	2	8
		% of Total	27.3%	0.0%	0.0%	9.1%	36.4%
	Female	Count	6	5	1	2	14
		% of Total	27.3%	22.7%	4.5%	9.1%	63.6%
Total		Count	12	5	1	4	22
		% of Total	54.5%	22.7%	4.5%	18.2%	100.0%

In above Table and figure, respondent's answers are presented in form of counts and percentage out of total. The figure shows two dimensions, one is count and another is percentage out of total in order to comprehend the overall information. The respondents are characterized into two categories 'Male' and 'Female'. Mostly replied for 'Daily (Every class day)' as can be seen by the high percentage rate out of total in Table and figure as well. Similarly, majority avoided the answer 'Occasionally (a few class)' as can be seen from the table and figure showing a few count and very low percentage

Table 32: Discuss a real-world problem							
			Daily (Every class day)	Frequently (most class days)	Sometimes (about half of class)	Occasionally (a few class)	Total
Please specify your gender	Male	Count	3	3	1	1	8
		% of Total	13.6%	13.6%	4.5%	4.5%	36.4%
	Female	Count	4	6	4	0	14
		% of Total	18.2%	27.3%	18.2%	0.0%	63.6%
Total		Count	7	9	5	1	22
		% of Total	31.8%	40.9%	22.7%	4.5%	100.0%

In above Table and figure, respondent's answers are presented in form of counts and percentage out of total. The figure shows two dimensions, one is count and another is percentage out of total in order to comprehend the overall information. The respondents are characterized into two categories 'Male' and 'Female'. Mostly replied for 'Daily (Every class day)' as can be seen by the high percentage rate out of total in Table and figure as well. Similarly, majority avoided the answer 'Occasionally (a few class)' as can be seen from the table and figure showing a few count and very low percentage.

Table 33: Ask students to work together to analyze and solve problems

			Daily (Every class day)	Frequently (most class days)	Sometimes (about half of class)	Occasionally (a few class)	Total
Please specify your gender	Male	Count	3	5	0	1	9
		% of Total	13.0%	21.7%	0.0%	4.3%	39.1%
	Female	Count	6	5	3	0	14
		% of Total	26.1%	21.7%	13.0%	0.0%	60.9%
Total		Count	9	10	3	1	23
		% of Total	39.1%	43.5%	13.0%	4.3%	100.0 %

In above Table, respondent's answers are presented in form of counts and percentage out of total. The figure shows two dimensions, one is count and another is percentage out of total in order to comprehend the overall information. The respondents are characterized into two categories 'Male' and 'Female'. Mostly replied for 'Daily (Every class day)' as can be seen by the high percentage rate out of total in Table and figure as well. Similarly, majority avoided the answer 'Occasionally (a few class)' as can be seen from the table and figure showing a few count and very low percentage

Table 34: Encourage students to ask "what if" questions							
			Daily (Every class day)	Frequently (most class days)	Sometimes (about half of class)	Occasionally (a few class)	Total
Please specify your gender	Male	Count	2	4	1	2	9
		% of Total	8.7%	17.4%	4.3%	8.7%	39.1%
	Female	Count	4	5	5	0	14
		% of Total	17.4%	21.7%	21.7%	0.0%	60.9%
Total		Count	6	9	6	2	23
		% of Total	26.1%	39.1%	26.1%	8.7%	100.0%

In above Table, respondent's answers are presented in form of counts and percentage out of total. The figure shows two dimensions, one is count and another is percentage out of total in order to comprehend the overall information. The respondents are characterized into two categories 'Male' and 'Female'. Mostly replied for 'Daily (Every class day)' as can be seen by the high percentage rate out of total in Table and figure as well. Similarly, majority avoided the answer 'Occasionally (a few class)' as can be seen from the table and figure showing a few count and very low percentage.

Table 35: Frequently ask "why do you think so?" questions							
			Daily (Every class day)	Frequently (most class days)	Sometimes (about half of class)	Occasionally (a few class)	Total
Please specify your gender	Male	Count	4	2	2	1	9
		% of Total	17.4%	8.7%	8.7%	4.3%	39.1%
	Female	Count	6	7	0	1	14
		% of Total	26.1%	30.4%	0.0%	4.3%	60.9%
Total		Count	10	9	2	2	23
		% of Total	43.5%	39.1%	8.7%	8.7%	100.0%

In above Table and figure, respondent's answers are presented in form of counts and percentage out of total. The figure shows two dimensions, one is count and another is percentage out of total in order to comprehend the overall information. The respondents are characterized into two categories 'Male' and 'Female'. Mostly replied for 'Daily (Every class day)' as can be seen by the high percentage rate out of total in Table and figure as well. Similarly, majority avoided the answer 'Occasionally (a few class)' as can be seen from the table and figure showing a few count and very low percentage.

Table 36: Teacher act as a facilitator of learning in the class							
			Daily (Every class day)	Frequently (most class days)	Sometimes (about half of class)	Occasionally (a few class)	Total
Please specify your gender	Male	Count	6	2	0	1	9
		% of Total	26.1%	8.7%	0.0%	4.3%	39.1%
	Female	Count	8	4	2	0	14
		% of Total	34.8%	17.4%	8.7%	0.0%	60.9%
Total		Count	14	6	2	1	23
		% of Total	60.9%	26.1%	8.7%	4.3%	100.0%

In above Table, respondent's answers are presented in form of counts and percentage out of total. The figure shows two dimensions, one is count and another is percentage out of total in order to comprehend the overall information. The respondents are characterized into two categories 'Male' and 'Female'. Mostly replied for 'Daily (Every class day)' as can be seen by the high percentage rate out of total in Table and figure as well. Similarly, majority avoided the answer 'Occasionally (a few class)' as can be seen from the table and figure showing a few count and very low percentage.

Table 37: Allows time to students to consider alternative point of view							
			Daily (Every class day)	Frequently (most class days)	Sometimes (about half of class)	Occasionally (a few class)	Total
Please specify your gender	Male	Count	4	5	0	0	9
		% of Total	17.4%	21.7%	0.0%	0.0%	39.1%
	Female	Count	6	5	2	1	14
		% of Total	26.1%	21.7%	8.7%	4.3%	60.9%
Total		Count	10	10	2	1	23
		% of Total	43.5%	43.5%	8.7%	4.3%	100.0%

In above Table, respondent's answers are presented in form of counts and percentage out of total. The figure shows two dimensions, one is count and another is percentage out of total in order to comprehend the overall information. The respondents are characterized into two categories 'Male' and 'Female'. Mostly replied for 'Daily (Every class day)' as can be seen by the high percentage rate out of total in Table and figure as well. Similarly, majority avoided the answer 'Occasionally (a few class)' as can be seen from the table and figure showing a few count and very low percentage.

Summary of the Results of Teacher's Questionnaire

The information obtained from the previous tables depicts that majority of the teachers utilizes the critical thinking skills daily or frequently in their teaching strategies. Teacher's questionnaire result shows that brainstorming, using models and visuals to represent the complex ideas, encouraging students to use existing knowledge to generate new ideas, accepting all student valid responses and asking "Why do you think so?" questions are being utilized by the teachers daily in their teaching strategies. Along with that, encouraging the students to ask "what if" questions, allowing time to students to consider alternative point of view and asking students to work together to analyze and solve the problem have been utilized frequently in the teaching strategies. Thus, teacher's questionnaire result shows that numerous critical thinking skills have been used by

the teachers in their teaching strategies to develop and enhance student's learning of critical and creative thinking.

4.13 Quantitative Class Observation Checklist on Teaching Methods

Table 38: Descriptive statistics of teacher's teaching methods and students learning methods

What teacher does	English			Science			Learning Inquiry		
	mean	std	Rank	mean	std	Rank	mean	Std	Rank
Brainstorming was implemented by the teacher	4.75	0.43	1	4.75	0.43	1	4.75	0.43	1
Use model and simulations (video/science demo/experiment/acting out) to explore complex system and issues.	4.25	0.43	2	4.75	0.43	1	4.25	0.43	2
Inquiry questions are prominent during class session.	4	0.70	3	4.75	0.43	1	4.75	0.71	1
Short quizzes are given at the end of the lesson to retrieve student's knowledge.	3.25	0.43	4	3	0.71	5	3.25	0.43	4
Students are asked to underline important sentences in the book.	3.25	0.43	4	2.75	0.43	6	3.25	0.43	4
Teacher collected the quizzes and said that he/she will grade them later.	3.25	0.43	4	2.75	0.43	6	2.75	0.43	6

Students have been asked to listen to teacher's lecture as teacher will ask them a quiz at the end of the lesson.	3	0.70	5	2.5	0.50	7	3	0.71	5
Students were asked to pay attention to the lesson as teacher will bring questions from the same lesson in the exam.	2.75	0.43	6	2.5	0.87	7	2.75	0.43	6
Teacher constantly talk for 30 minutes about the lesson in the class.	2	0.70	7	3.75	1.30	3	2	0.71	7
Teacher asked the students to close their books, pay attention and listen.	1.75	0.43	8	1.75	0.43	8	1.75	0.43	8
Teacher asked the students: "How will you answer the questions in the exam if you will not focus on the lesson"	1	0	9	1.25	0.43	9	1	0.00	9
What students do									
Students are motivated and participate in class activities.	4.75	0.43	1	4.75	0.43	1	4.75	0.43	1
Students start discussing with each other when a	4.75	0.43	1	4.75	0.43	1	4.75	0.43	1

task is assigned to them in the class									
Students start answering in class discussion.	4.5	0.5	2	4.25	0.83	2	4.75	0.43	1
Students passively listen to the teacher during lecture	4.25	0.43	3	4.25	0.43	2	4	0.71	3
Students read from the textbook during class time.	4.25	0.43	3	4.25	0.43	2	4.75	0.43	1
Students check the answers with their peers.	4.25	0.43	3	4.25	0.43	2	4	0.71	3
Students close textbooks and listen	3.75	0.43	4	4.25	0.43	2	3.75	1.09	4
Students start to underline the sentences using coloring pens, and most of them were looking at each other's book to do the same.	3.75	0.43	4	3.75	0.43	3	2.25	0.43	6
Students are looking around and drawing in their textbooks	2.75	0.82	5	3.5	0.87	4	3.5	0.50	5
Only few students raise their hands to answer in the class	2.75	0.43	5	2.5	0.50	5	2.25	0.43	6
Students are mostly silent during class time and do not participate in class discussions	2.25	0.43	5	1.75	0.43	6	2	0.71	7

In Table 38, "What teacher does" and "what students do" are ranked in terms of mean value. For English subject, in terms of what teacher does, "Brainstorming was implemented by the teacher in the class" ranked 1st in all three subject classes. For Science subject, in terms of what teacher does, "Use of models /simulations and Inquiry questions in the class" also rank 1st.For Learning Inquiry subject, in terms of what teacher does "Learning Inquiry questions are implemented in the class" ranked 1st.

In case of students learning methods," Students are motivated and participate in class activities and Students start discussing with each other when a task is assigned to them in the class" ranked 1st

4.14 Quantitative Class Observation Checklist on Teaching's Strategies

Table 39: Descriptive statistics for teacher's teaching strategy (N=12)

Teacher's strategy	English			Science			Learning inquiry		
	mean	std	Rank	mean	std	Rank	mean	Std	Rank
Teacher encourage students to express ideas from different point of views.	1.00	0.00	1.00	4.25	0.43	1.00	1.50	0.43	1.00
Rote memorization is encouraged during lessons.	1.25	0.39	4.00	1.00	0.00	5.00	1.00	0.00	5.00
Students are encouraged to ask "what if "questions in the class.	1.25	0.39	2.00	1.75	0.43	2.00	1.50	0.50	1.00
Teacher encourages group discussion and activities.	1.25	0.39	2.00	4.25	0.43	1.00	1.25	0.43	2.00
Teacher emphasizes more on the grades rather than effort.	1.25	0.39	3.00	1.25	0.43	4.00	1.25	0.43	2.00

Teacher encouraged students to write answers from the textbook using the exact words.	1.00	0.00	3.00	1.50	0.50	3.00	1.25	0.43	2.00
Teacher frequently use following phrases in the class: Not listening, Low grades, Not focusing, Not understanding etc.	1.00	0.00	4.00	1.25	0.43	4.00	1.25	0.43	4.00
Teacher explain the lesson while reading from the textbook.	1.00	0.00	1	1.25	0.43	3.00	1.50	0.43	4.00
Students learning methods									
Students gather and organize relevant information to gain knowledge.	1.50	0.50	2.00	2.00	0.71	1.00	2.00	0.71	3.00
Students consider ideas from multiple perspectives and from diverse point of views	2.00	0.71	1.00	1.75	0.83	2.00	2.75	0.43	1.00
Students justify thinking to teachers and peers	1.50	0.87	2.00	1.50	0.50	3.00	2.25	1.30	2.00
Students rely frequently on the recall of the facts.	1.50	0.87	2.00	1.50	0.87	3.00	1.25	0.43	5.00

Students rarely get the opportunity to participate and express their ideas in the class.	1.25	0.43	3.00	1.25	0.43	4.00	1.00	0.00	6.00
Student feel bored and feel reluctant to ask questions in the class.	1.00	0.00	4.00	1.00	0.00	5.00	1.00	0.00	6.00
Students are motivated to study only for the grades	1.25	0.43	3.00	1.75	0.43	2.00	1.75	1.30	4.00
Students rely on rote memorization	1.00	0.00	4.00	1.50	0.50	3.00	1.00	0.00	6.00

Above in Table 39, teacher strategies are ranked based on mean value. For English subject," Teacher explain the lesson while reading from the textbook" and "Teacher encourage students to express ideas from different point of views." strategy rank 1st. For Science subject "Teacher encourage students to express ideas from different point of views and also the group discussion" rank 1st.For Learning Inquiry subject "Teacher encourage students to express ideas from different point of views and also the teacher encourages "What if" questions in the class" rank 1st.

In case of Student's learning methods, for English and Learning Inquiry Subjects, "Students consider ideas from multiple perspectives and from diverse point of views" ranked 1st.For Science subject, "Students gather and organize relevant information to gain knowledge" ranked 1st**.**

Table 40: Comparing difference of mean of different subject teacher's strategies

	Subject	**N**	**Mean Rank**
Teacher's teaching strategies	English	4	1.53
	Science	4	1.79
	Learning inquiry	4	1.55

	Total	12	

Test	**Teaching strategies of different subject teacher**
Chi-square test Statistics	1.79
Df	2.00
P-Value	0.56
Kruskal Wallis Test	
Grouping Variable: Subject	

In Table 40, Mean Rank of different subjects are given using k-independent non-parametric test. In lower portion, Kruskal Wallis test applied and Chi-square test statistics is 1.795. the P-value is 0.564 that is greater than 0.05, thus we accept the null hypothesis and claim that there is no difference in the mean rank of all the subjects.

Table 41: Relationship between teacher's teaching strategies and students learning methods

Spearman's rho Rank correlation	**Students learning methods**
Teacher's teaching strategies	0.928**

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

In above Table 41, Spearman's Rank correlation estimated between teacher's teaching strategies and students learning methods. The estimated correlation coefficient is 0.98 and significant as p-value < 0.01. It shows a linear positive relationship between teacher's teacher strategies and student's learning methods. And this relationship having a strong linear relationship and statistically significant as coefficient of correlation value is 0.928 with p-value < 0.01. There is strong positive linear relationship between teaching strategies of teachers and students learning methods.

4.15 Teacher Assessment Report

Table 42: Descriptive statistics for Teacher assessment reports

Teacher Assessment	English			Science			Learning Inquiry		
	Mean	Std	Rank	Mean	Std	Rank	Mean	Std	Rank
Cultivating a positive sociological learning environment in the class	5.5	0.25	4.0	6.5	0.25	1.0	6.5	0.25	1.0
Class activities to promote learning motivation among students	6.0	0.5	3.0	6.0	0.5	2.0	6.0	0.5	2.0
Explicitly explaining the lesson objectives and goals to students	5.5	0.25	4.0	5.5	0.25	3.0	5.5	0.25	3.0
Present suitable and correct information corresponding to students' learning level.	4.5	0.12	1.0	4.5	0.12	5.0	4.5	0.12	5.0
Applying the information in the lesson to real life and environment.	6.5	0.15	2.0	6.5	0.15	1.0	6.5	0.15	1.0
Teaching methods are very well organized, and teacher's knowledge is up to date.	5.0	0.5	5.0	5.5	0.5	3.0	5.5	0.5	3.0
Students are motivated to share their ideas in the class	5.5	0.5	5.0	6.5	0.5	1.0	6.5	0.5	1.0

Students are motivated to reach to conclusions and explore possibilities	6.0	0.25	3.0	5.0	0.25	4.0	5.0	0.25	4.0
Students are encouraged to ask relevant questions in the class and promote self-learning	6.5	0.15	2.0	6.5	0.15	1.0	6.5	0.15	1.0
Students are motivated to have a positive competition among peers.	5.0	0.0	5.0	5.0	0.0	4.0	5.0	0.0	4.0
Students are encouraged to build focus and concentration	7.0	0.15	1.0	6.0	0.15	2.0	6.0	0.15	2.0
Teacher demonstrate good behavioral attitude with students	6.0	0.25	3.0	6.0	0.25	2.0	6.0	0.25	2.0
Good and effective use of academic time in class	4.5	0.5	1.0	4.5	0.5	5.0	4.5	0.5	5.0
Teacher gives immediate feedback to students	5.75	0.25	4.0	5.50	0.25	3.0	5.50	0.25	3.0
Teacher effectively utilizes a variety of teaching aids like video/simulation/charts/experiments etc.	4.5	0.4	2.0	4.5	0.4	5.0	4.5	0.4	5.0
Teacher train the students for self-evaluation	5.5	0.4	4.0	5.5	0.4	3.0	5.5	0.4	3.0
Teacher utilizes variety of assessment methods (verbal, written, performance)	4.3	0.4	3.0	4.3	0.4	6.0	4.3	0.4	6.0

Above in Table 42, for different subject, Teacher Assessment report's ranks are presented. For Science and Learning inquiry subjects "Cultivating a positive sociological learning environment in the class", "Applying the information in the lesson to real life and environment." and "Students are motivated to share their ideas in the class "all ranked 1st.For English class, "Present relevant

and correct information corresponding to students' learning level and 'Good and effective use of academic time in class "ranked 1st in teaching and learning methods.

Table 43: Difference in the mean of teacher assessment factors between different subject teachers

	Subject	N	Mean Rank
Preparation	English	4	7
	Science	4	6.5
	Learning Inquiry	4	6.5
	Total	12	
Knowledge	English	4	6.5
	Science	4	6
	Learning Inquiry	4	6.5
	Total	12	
Teaching/learning method	English	4	6.5
	Science	4	6
	Learning Inquiry	4	6.5
	Total	12	
Students Participation	English	4	5.5
	Science	4	7
	Learning Inquiry	4	7
	Total	12	
Class Management	English	4	6.5
	Science	4	7
	Learning Inquiry	4	6.5
	Total	12	
Assessment	English	4	7.5

	Science	4	6
	Learning Inquiry	4	6
	Total	12	

Table 44: Test Statistics

	Test Statistics					
	Preparation	**Knowledge**	**Teaching/Learning methods**	**Students participation**	**Class management**	**Assessment**
Chi-Square	2.198	1.120	1.122	0.010	1.811	1.110
df	4	4	4	4	4	4
P-value	0.201	0.121	0.368	0.321	0.577	1
a. Kruskal Wallis Test						
b. Grouping Variable: subject						

Above in Table 44, by using non-parametric test, the mean of teacher's assessment factors among different subjects are presented. The p-values is greater than 0.05 for all the factors, thus accepting the null hypothesis and it is concluded that there is no difference in the mean rank among different subjects. For student participation and assessment, the mean ranks are different among subjects. However, the degree of difference is very slightly not able to reject the null hypothesis of equal mean rank. In addition, in rest of the factors mean ranks are same almost.

4.2 Qualitative Results

All the events that were observed during the class observations were documented and a checklist was then utilized to report the events related to the development of the critical thinking skills in the English, Science and Learning Inquiry Classes. During the analysis of the qualitative data, open coding strategy is adopted to distinguish the various patterns in the collected data. Then, in-vivo codes are developed that represent the critical thinking strategies used in the class. Codes are then being categorized so as to include all the critical thinking teaching strategies. Coded excerpts are then studied in detail to further produce different themes about the critical thinking strategies observed during class observations. Following themes are observed more frequently during class observations that foster critical thinking:

Students were encouraged to work in the groups with collaboration of peer

Group work was highly encouraged during English, Science and Learning Inquiry classes. Students formed groups very comfortably and start sharing the ideas with each other. In one of the Science lessons, teacher divided the students in groups, each group sitting at the round table. Teacher, then gave each group different pictures and asked them to work together and then arrange them according to whether it is natural light, man-made light or if it's not a source of light. Students collaborated with each other very well and arrange the pictures accordingly. Teacher then asked the students to choose one lead speaker from each group, which students did after discussion. Teacher, then asked the lead speakers to remain at the round table and asked the other group members to move to the next round table. Then, the lead speakers were asked to explain the arranged pictures according to the source of light to the new group.

Lead Speaker: Can you identify the natural source of light from the pictures?

Group student: Sun

Another student: Moon

Lead Speaker: Yes, Sun is the correct answer as it is a natural source of light but Moon is not a natural source of light.

Group student: Why does the Moon shine and looks bright if it's not the natural source of light?

Students discuss in group about how Moon shines but is not the natural source of light?

Lead Speaker: Moon shines because the surface of the Moon reflects the sunlight but Moon is not the natural source of light.

It was an excellent strategy used by the teacher and really motivated the students engaging the whole class in effective learning and giving opportunity to the students to explain their views and ideas with other students.

Students were encouraged to build on their previous knowledge

It was observed that the students were encouraged to build on their prior knowledge which is an important aspect in teaching critical thinking skills to students. In one of the lessons of Learning Inquiry, teacher gave a work sheet to students that was divided into two parts: Connect and Extend. Connect represent summarizing the prior knowledge about the topic and Extend represent the extra knowledge that has been added and how it relates to the prior knowledge. Students were then asked to write down list of the sustainable resources that they know of in the Connect part of the sheet. Teacher, then showed a very useful video about the sustainability to the class. Video was shown twice and paused at regular intervals, so students retain the knowledge and take notes. At the end of the video, teacher asked the students to write down points that extended their knowledge about the sustainability in the Extend part of the work sheet. Students were then encouraged to share and discuss their extended knowledge with the class. Another very useful and purposeful teaching strategy used by the teachers to foster critical thinking in the class.

Teachers encouraged brainstorming at the beginning of the class

It was observed that the teachers encouraged brainstorming at the beginning of the class to encourage the students to start thinking creatively about the subject and at the same time motivating the students in class participation. In one of the Learning Inquiry class, students were asked to come up with the ideas on the question,' How long the resources of the Earth will last?"

Similarly, in the English class, teacher asked the students to come up with the meaning of the word," ambition". Students presented interesting and creative ideas to the class and leads to class discussion. It's also a very useful teaching strategy to enhance student's critical thinking skills.

Classroom discussion was encouraged

In English, Science and Learning Inquiry classes, teacher encouraged class discussion where students feel comfortable in sharing their point of view as well as to listen to other student's ideas. Classroom discussion especially in one of the Science classes, teacher encouraged the students to a have group discussion about the properties of matter that lead to the generation of some very interesting ideas. Teacher asked the students to discuss among the group the advantages and disadvantages of chocolate door handle. Students got really motivated and start discussing the idea in the group. Teacher went to each group and encourage them to share their ideas. Student came up with some very interesting ideas such as "Chocolate door handle will melt soon so door handle should be made of something that would not melt". Teacher then encouraged the students to discuss in the group about three things they need to make a solid door handle. Students discussed among each other and came up with creative ideas. One student said," I think metal is a good material to make door handle as it is strong and will not melt." Teacher then discuss various properties of metals with students. Teacher handed different objects like wooden puzzle pieces, rubber, cotton, sponge etc. to each group and asked them to discuss as a group about the properties of each material. Students were really involved in the group discussion and were encouraged by the teacher to share their ideas with the class.

Teacher act as facilitator of learning

It has been observed that the teachers utilize student -centered learning where the students are given the independence of learning whereas the teacher act as a facilitator who helps in the student's reaching their learning goals. Like, in the English language class, teacher divided the class into two groups and gave them class activities. While the students are involved in the class activities, the teacher facilitated the learning by guiding the students about their learning. Teachers provide positive feedback to the students learning. Thus, the teacher builds on the constructionist classroom learning where there are mutual positive responses from the teachers and learners.

Classroom environment conducive to foster critical thinking

In all the English, Science and Learning Inquiry classes, it was clearly observed that the classroom learning environment was very supportive and positive. Teacher's encouraged the students to ask questions, share their viewpoints and listen and respect the point of view of others. New creative and innovative ideas were encouraged. Teachers act as facilitator of learning guiding and supporting student's learning and providing positive feedback. Thus, the classroom environment is found to be very positive and conducive to foster critical thinking skills in students.

Above highlighted quantitative and qualitative results depict the method, strategies applied by the teachers to foster critical thinking skills among students in private school in Dubai, UAE. Significant findings related to developing critical thinking skills among students will be discussed along with the view of literature in the next chapter, which will also comprise of conclusion and limitation of the current research.

Chapter 5: Discussion, Conclusion, Recommendations, and Limitations

Critical thinking enriches the learning environment of the classroom and also helps the students to develop new concepts and skills in the required field of study. This chapter presents a detailed overview of the result findings of the study to answer the two research questions. All the necessary and possible insights have been tried to extract from the research data. Thus, data analysis from the previous chapter will be utilized, linked and argued so as to set suitable conclusion, future recommendations, implications and limitations of the research.

5.1 Discussion

The current section also discusses the conclusion of the research by studying the results of the research question that were asked at the beginning of the research. At the end, the current section also gives the recommendations and limitations for future research in the same field.

Critical thinking is a skill that can be taught and learned. Critical thinkers are supposed to be better in decision making, problem solving and at the same time more professionally capable. (Facione

et al.,1995). Critically thinking is the logical and well-organized process of skillfully thinking, applying, analyzing, synthesizing and evaluating the information.

The first question in the current research was to explore! how teachers in private school in Dubai develop learning environment to enhance critical thinking among students. The results of the present study through student's questionnaire and observation report clearly indicates that learning environment in Dubai private school is conducive for enhancing critical thinking among students. Result of the current study depict that majority students (63.8%) are encouraged by teachers on participation in discussion during the lesson, as it would help students to develop critical thinking. It is good to know that 65% students share their point of views in the class along the students (33.8%) who share sometimes(.91%)of the teachers agree that they frequently accept all students valid responses during class discussion and(81%)of the teacher agrees that incorrect student response elicit encouraging and supporting comment. Review of literature confirms that classroom discussion enhances student's involvement in their own learning (Leeds et al,1998). Classroom discussion gives an opportunity to the students to share and learn from each other's point of view. Same idea is supported by Hertenstein (1991) that one of the benefits of classroom discussion is that the students learn by contributions of others in the lesson. Classroom discussion also develops student's higher order thinking thus promoting critical thinking skills among students (Ewens,2000). Same idea is supported by Wade (1994) that higher order thinking skills are developed by classroom discussions during lessons.

Classroom observations are done to verify the results obtained through questionnaires. During class observations of Science and Learning Inquiry classes," Teacher cultivate positive sociological learning climate in the class and present purposeful motivation to students for effective learning" ranked **1st.** For English class," Teacher implementing classroom activities that are engaging and equivalent to student's learning level & good and effective use of academic time in class ranked **1st**. Further, all subjects' teachers explain the lessons goals to the students very clearly during the lessons and they also present very appropriate and relevant information up to student's level. All subjects' teachers try to map lesson to prevailing events and environments and give real life examples for better understanding of the students. Teachers work in a very organized way and they appreciate students for participating in discussions. All the subjects' teachers show a very cooperative and kind behavior and remain very punctual for class timing. Teachers effectively uses a variety of learning aids such as showing useful educational videos on smart

boards, use of iPad for class activities and sharing learning resources. Many research studies depict the benefits of using the technology in the classroom. Technology can be utilized to rearrange and restructure the classroom to develop learning environment that foster critical thinking skills. (Kurt,2010). Using technology in the classroom has the ability to enhance student's interest, motivation and learning. (Baytak et al.,2011)

Teachers facilitate student's learning by monitoring student's work and give immediate positive feedback. Among the many other factors, teacher's behavior also plays a significant role in promoting student's engagement and participation in the class. (Skinner et al,2008). Today, the teacher's role in education is very different from the old-styled classroom. In today's world teacher should be the facilitator developing student understanding and the source and resource that encourage students to think independently and critically. (Chen et al., 2011; Jang et al.,2016).

Developing student's critical thinking skills is one of the most important goal of education in today's world (Paul & Elder,2006) Achievement of critical thinking skills is highly desired for students to face the future challenges of the modern world.(Nickerson,1998).Thus, educationalist and researchers have been proactive in developing the curriculum where teaching strategies emphasizes on the attainment and transference of critical thinking skills.(Perkins&Salomon,1998). Pascarella & Terenzini (2005) emphasizes that a well-structured and organized instructional programs would lead to the student to become effective critical thinkers. However, effective teaching strategies do not work in classroom all the time. At times, teachers need to modify or completely change certain teaching strategies to successfully sustain the teaching and learning process. However, the general features of a thinking classroom can be represented as students actively engaged in learning, students asking frequent questions and sharing ideas that represent out of box thinking. (Browne & Freeman 2000). Brookfield (2003) claims that the research depicts that the critical thinking is best developed among students when they work in small groups on unconsidered viewpoints. Brookfield (2003) emphasizes that critical thinking is also fostered through case studies, scenarios and interactive lecturing. However, teacher's lectures should not contain higher than 20 minutes of continuous teacher's talk. (Brookfield,2006). Reflection is also an important aspect of critical thinking teaching. Reelection is beneficial for both teachers and students for the teaching and learning process. Written coursework also motivates critical thinking as they can provide a platform for the learner and the instructor to reflect on the completed work and what is required to be done. (Tsui,1999).

Further it was observed that the general environment of the classroom was very relaxed and comfortable where students were keenly engaged in group discussions and classroom activities. A learning environment is essential in the classroom to enhance the critical thinking skills among students. Stupnisky (2008) supports the idea that teachers should create classroom learning environment and classroom activities that give confidence to students and build their critical thinking skills. In the past, there had been many researches on the learning environment that emphasize on classroom observations (Chavez1984). Students learning and creativity is decreased in a strict and intimidating classroom environment. Thus, teachers should endeavor to make relaxed, peaceful classroom environment by encouraging students to participate in classroom activities and by accepting different opinions and ideas of students.

Students almost show same learning behaviors in all subjects. There is no significant difference to see in their learning methods for these different subjects. In all subjects, students use to discuss and listen each other's point of view and they check the answer with their peers. Students seems motivated and actively participate in the classroom activities. Students in learning inquiry class mostly use to start answering and asking questions when a work is assigned to them. It rarely happens in any class that students looking around and drawing in their notebooks or a few students raise their hands to answer, rather majority of the students raise their hands and try to participate in the discussion during the lesson. Gokhale. A (1995) claims that teaching strategies involving collaborative work a play a very vital role in developing critical thinking skills among students. Exchange of ideas in group work is the key to develop critical thinking skills among students. (Gokhale. A1995). Totten et al. (1991) supports the idea that student-centered teaching in which the students are given responsibility of teaching leads to the development of critical thinking skills among students. Mathew & Lowe (2011) emphasized that different features of classroom environment such as teacher student relationship, type of content studied in class, interaction among peer students and the classroom learning activities directly influence student's critical thinking. Teachers should develop classroom learning environment in such a way to hold the interest of the students by having purposeful discussion and welcoming the thoughts and views of all students. Kwan, W.& Wong, F (2014) also supports the idea that good learning atmosphere is conducive to develop the critical thinking skills in students. Thus, as the students are motivated to learn in an educational environment, they can then be guided to build their skills for evaluating and solving problems by utilizing the critical thinking skills.

The second question in the current study was that what teaching methods and strategies are utilized by the teachers to foster critical thinking among students? In under examined study of critical thinking of teachers in observed school discovered that most of the teachers reported the use of various teaching strategies that cultivate critical thinking among students. In the teacher's questionnaire**,(66%**)of teacher daily encourage students to use existing knowledge to generate new ideas **.(65%**)of the teachers frequently encouraging students to ask "what if "questions during their teaching.(**86%)** of teachers allows time to students to consider alternative point of view", whereas (**81%)** of teachers solicit multiple and diverse point of view about a question or an issue and encourage transfer of the cognitive skills to everyday life and relating the knowledge to real life problems. 66.30% students indicated that they are encouraged by their teachers on asking a question in the class during lesson, in addition to this, 32.5% say sometimes they are encouraged. A good thing to know that students (83.8%) frequently ask questions about something they did not understand in the lesson. Mostly students studied (67.50%) for the exams by understanding the lessons by writing in their own words and ideas. In case students have problem in understanding the questions, then mostly (66.30%) ask their teachers to explain it for them again a bit more in details. In addition, a portion of students (25%) who use to take help of their friends in order to understand the problem. Student's questions have a vital part in the purposeful learning experience. Thus, student's questions are the valuable source of both effective learning and teaching. Paul & Elder (2009) are of the view that an active critical thinker is always a good questioner. Thus, a mind is not intellectually alive if it does not generate questions. Chin (2004) emphasizes that questions coming from the students are an indicator that the students are involved in the thinking process and are trying to interlink the current knowledge with the prior knowledge. McCollister & Sayler (2010) also supports the idea that the student's questions are a representation of the student's desire to further enhance their knowledge in a particular direction and depicts that the students are analyzing the collected information rather than just memorizing the facts. View of literature depicts that many researchers have emphasized on the importance of student's questions. (Walsh & Sattes 2010). Paul &Elder (2009) supports the idea that questions that are asked by students stimulate their previous knowledge and help them to concentrate on the learning abilities. Pizzani &Shepardson (1991) also emphasizes that the ability to ask effective questions leads to better problem-solving skills which leads to creativity and critical thinking skills. Gallas (1995) supports the idea that the student's ability to ask questions is valuable and it enhances students critical thinking skills. Student's questions are beneficial not only for the

students themselves, but they are beneficial for the teachers as it promotes student's class participation along with enhancing their critical thinking skills.

There are several strategies, which are ranked, common among all these different subjects and only a few strategies are ranked differently. Mostly all subjects' teachers use brainstorming in the beginning of the class (ranked 1st among all subjects). A very appreciative thing is that (52%) of the teachers daily utilizes brainstorming and (35%) of the teachers frequently utilizes brainstorming as a class or among students to produces new creative ideas. Brain storming is considered a very effective and useful teaching learning strategy and it can be used in various ways in an educational setting. Research depicts that brain storming is a very useful technique to promote student's interaction and collaboration. Richard (2006) research results depicts that students trained in brainstorming are more competent in producing creative ideas than students who are not trained in brainstorming. Same idea is supported by research conducted by Rao (2007) that students skilled in regularly utilizing brainstorming techniques shows significant better results in writing assignments. VanGundy (1981) supports the idea that brainstorming promotes innovative ideas and critical thinking skills in students. Rao (2007) research suggests that student's interaction and collaboration is vital part of intellectual skills related to producing innovative ideas

Science subject teacher used various diagrams and charts to explain the lesson and at the end of the lesson, Science teacher gave small quiz about the lesson to check student's concept development. For Learning Inquiry subject, the inquiry questions were prominent throughout the lesson. During the class observations, it was noted that in all the subject classes, teachers encouraged cooperative learning where teachers act as facilitators. In English, Science and Learning Inquiry classes teachers encouraged students to ask questions and give positive feedback. In all three subjects, group work is encouraged where students discuss new ideas and help each other in learning thus developing critical thinking skills and teamwork. Teaching strategies for the Science subject has really evolved in the modern times and comprise of many features such as inquiry-based learning, problem solving, cooperative learning methods etc. Poonpipathana et al. (2014) research on the lesson planning confirms that the incorporation of the critical thinking skills in the lessons are highly beneficial and contribute in enhancing student's critical thinking skills. Bohn (2017) claimed that the scientific teaching strategies used by the teachers at primary level will impact the future careers of the

students. Past studies have depicted that the teachers should adopt to new teaching strategies built on the reflective thinking. (Gence,2008; Toman&Cimer,2014).

Moreover, in this school, students use to study (60%) in order to enhance their critical thinking skills. Students have various advises from teachers, and top of them is that teachers ask students (75%) to solve their problem by using their own abilities, understandings and discussion as it would help them to self-reliance and assist them in critical thinking.

It is good to know that during lesson (70%) of the teachers ask the students to develop opposing or corresponding arguments whereas (66%) of the teachers present questions for discussion that have no clear right or wrong answer. Thus, it helps to explore different point of view of students and leads to effective classroom discussion. (95%) of the teachers frequently encourage students to utilize the existing knowledge to generate new ideas or solve an unfamiliar problem. During class observation, it was evident that all subject teachers encourages classroom discussion and motivates the students to share their ideas with the class. During English lesson, it was observed that the teacher encouraged the students to read the part of the literature and then based the classroom activities on the same part of the literature. Students were then divided in the groups and the teacher gave 3 sheets representing 3 different characters from the literature book. Teacher then asks each group to discuss about what each character is thinking in their mind. Students felt very motivated and start discussing with each other. Thus, English teacher encouraged critical thinking skills in students as every student has his/her opinion about what the characters of the book are thinking. Also, for Science and Learning Inquiry classes, teacher encourages group discussion and cooperative learning.

Classroom discussion and debate is one of the teaching strategies that has the capability to attract student's interest, at the same time students can interact with each other and with teachers more deeply. Florea & Hurjui (2014) supports the idea that teachers who apply group discussion as one of the teaching strategies leads to enhancing student's critical thinking. Fung & Howe (2014) one year long longitudinal research explored the effect of group work on the development of critical thinking in students. The results of the research depict that collaborative work in terms of class discussion and activities are more beneficial than the whole-class instructions in fostering critical thinking skills in students. Group discussion and group activities are a very effective way of promoting critical thinking skills among students. Burke (2011) research supports the idea that

group discussion helps to develop student's understanding and critical thinking. Brookfield and Preskill (1999) emphasizes that classroom discussion promotes student's active participation leading to the development of self-awareness, acceptance of different perspectives and thus creating deep understanding of the subject. Redfield (2000) emphasizes that classroom discussion opportunity to every student to freely participate, share their own ideas and listen to other student's ideas. Ewen (2000) supports the idea that classroom discussion enhances student's ability to think critically.

Fung, L, et al. (2016) supports the idea that the outcome of collaborative learning in the form of group discussion or class activities are far better than the individual activities. Copper (1995) supports the idea that collaborative learning produces a learning environment where the students have the support from the other students and guidance of teacher that helps to foster student's critical thinking. Nelson (1994) argues that collaborative learning in classroom promotes critical thinking skills in students as compared to the individual learning.

Further, the current study depicts that 60% of the students preferred their teachers as discussant and facilitator in the class during lesson. The result of the teacher questionnaire in the current research depicts that 87% of the teacher act as facilitator of learning in the class. During the class observations in the current research, it is also evident that majority of the teachers act as facilitator of learning in the classroom guiding the students in their group work activities and group discussions. Same idea is supported by Skinner, E.& Belmont,J (1993) that students appreciate teachers who can relate to present situation by facilitating and motivating student's learning. Albaneses (2004) argues that in a traditional classroom teaching, teacher dominate the classroom and students are passively receiving the knowledge. Margetson (1994) suggests that there should be a shift in the role of the teacher from dominating the classroom environment to a facilitator that promotes student centered learning encouraging students to freely share their point of view promoting effective teaching and learning.

Linear relationship between strategies of teachers and students learning methods estimated by spearman rank correlation. The correlation coefficient is 0.928. There are positive correlation values meaning that increase in teacher's teaching strategies also enhances student's learning. Thus, it shows that there is a positive relation between teaching strategies of teacher and learning methods of students. Richard (2002) and Moore (2005) supports the idea that the creativity of the teaching strategies by teachers have a positive effect on the student's motivation towards learning

Critical Thinking Cooperation (2006) emphasizes that critical thinking is the capability that is beyond memorization and questioning is the cornerstone of critical thinking. Emir (2009) supports the idea that purpose of an effective education is to develop the individual to realize the full potential that is already present in him or her. Teachers play a key role in fostering critical thinking skills among students; however, it has been noted that teaching is mostly situational and teaching strategies and roadmaps considered as effective do not always be effective in actual classroom. But certain teaching methods and strategies have been linked to fostering critical thinking skills among students. Browne &Freeman (2000) emphasizes that engaging in active learning, frequent questioning, frequently asking students to develop corresponding and opposing arguments and reflection are among the few teaching strategies that develop student's critical thinking.

In the framework of the UAE National Agenda, it is highly required that the students are well equipped with the critical thinking skills. Critical thinking skills are vital in the achievement of the Vision 2021 that "science, technology and innovation become the real drivers for sustainable socio-economic development". The key skill required to develop innovation is critical thinking. View of literature depicts that creativity and critical thinking are linked to each other. Scriven & Paul (2007) emphasizes that Critical thinking skills and creativity go hand in hand. Thus, it is the duty of the educators to foster critical thinking in the students from early age so that it becomes a lifelong beneficial habit. There had been a great progress in the education sector in Dubai, UAE since 2007, teachers are becoming well aware about fostering critical thinking skills in the teaching and learning. Martinez et.al (2016) emphasizes that education in the past was mainly teacher-centered but in modern world, teaching methods have greatly progressed as it is more student centered where critical thinking skills are encouraged among students that facilitates effective learning.

5.2 Conclusion

Critical thinking is considered as one of the most desirable skill of the 21st century. Educational policy maker such as CCSS (Common Core State Standard) emphasizes on a shift in the teaching strategies from mere rote memorization to cultivating 21st century skills such as creativity and critical thinking (CCSS,2016).Partnership for 21st Century skill (2007) list critical thinking as one of the most important skill required for the future job industry.

UAE Vision 2021 sets out the National Agenda for UAE to be amongst the most innovative nation of the world. Thus, effective teaching of critical thinking skills gains even more importance as critical thinking and creativity leads individuals to become more innovative. Hence, by developing the critical thinking skills among school students would lead to a future generation that is more creative, innovative and exceedingly productive. Teachers play a very important role in this regard as teachers can design the curriculum in a way that critical thinking skills are integrated in them. At the same time, teachers can play an important role in creating an educational environment in the classroom that is conducive to the teaching and learning of critical thinking skills among students. Costa (1991) emphasizes that the role of teacher is very significant in fostering critical thinking skills among students.

This research was aimed to explore whether private schools in Dubai foster critical thinking as one of the main objectives of education by exploring teacher's teaching strategies and teaching methods, also exploring the classroom environment whether it is favorable to implement critical thinking skills among students. Teacher and student questionnaire were utilized for this study for grade 5and 6 students and teachers. Class observations were also done in the same grades in Science, English and Learning Inquiry subjects. Quantitative and qualitative methods applied in this research to find whether critical thinking skills are being taught in the private schools in Dubai, UAE.

The conclusion of the study was that the private school in Dubai fosters critical thinking as one of the main objectives of education. It was found that the critical thinking skills have been embedded in all the teacher's teaching strategies and teaching methods. All the subject teachers in private school in Dubai are aware of the importance of critical thinking in education and develop class activities that promote critical thinking skills in students. Through class observations, it was evident that the classroom environment is very comfortable and encouraging where students are motivated to share their ideas and ask questions. Classroom environment is conducive for developing students critical thinking skills. Teachers encouraged group work where students work together thus building teamwork. Teachers act as facilitator of learning, supporting and guiding the students in their work. It has been observed during current research that the curriculum taught in private school is not entirely textbook based and the critical thinking skills have been integrated in the curriculum thus motivating students to think for themselves. Students are highly encouraged to ask questions and to express their thoughts and ideas. Moore (2004) supports the idea that well

organized and well-prepared teaching strategies have a positive effect on the students learning as students remain motivated and participate in process of teaching and learning.

Educational institutions in the private sector in UAE have evolved in the past many years to suit the need of a highly competitive job market. UAE Ministry of Education has developed Education 2020 strategy to bring about qualitative enhancement in the education particularly in teachers teaching strategies and student's learning methods. Private school sector in UAE is expected to drive UAE 's education sector to UAE's Vision 2021.Private sector institutes in Dubai have really been progressive in teaching and learning. There has been a significant shift from mere rote memorization to the fostering of higher order thinking skills thus cultivating critical thinking and creative skills among students. Forawi (2016) emphasizes that critical thinking skills helps the students to be aware of other important lifelong skills such as decision making and problem solving. Another important change in the private sector education is that it has become student centered where focus is on the students by giving them more independence in learning and believing in student's capacity to learn. Barr &Tagg (1995) supports the idea that the paradigm shift from teaching to importance given on learning has led the power to be shifted from the teachers to the students. Thus, by placing students at the center of learning process is a progressive step meaning that students can learn effectively and in ways that are suitable for them. Learning responsibility is on student and teacher act as facilitator of learning. (Edward,2001)

The current research has concluded that private school in Dubai are progressive and are contributing towards the UAE's vision 2021 to be the most innovative nation. Private school in Dubai are developing the critical thinking skills among students by encouraging classroom discussions, debates where students are freely discussing new and innovative ideas. Students are encouraged to ask questions and to build on their prior knowledge. Classroom environments is found to be highly favorable to foster critical thinking skills as teaching is student centered where teachers are facilitators of learning.

5.3 Recommendation & Implications

The current study researched about the teaching and learning of critical thinking in the private school of Dubai. It is recommended that a similar study can be conducted at a larger scale involving a large sample size of students and teachers so as to make generalized claims about teaching and learning of critical thinking in the private schools of Dubai. Further research can be

done by interviewing the teachers to know in detail about their conception of critical thinking. Furthermore, similar research can be conducted in colleges and universities to research whether critical thinking is an integral part of the higher education. It is also recommended to conduct a similar study at a larger scale by involving other stakeholders of education in order to have a broader view of critical thinking development in the field of education.

Teachers play a vital role to foster critical thinking among students. Pre-service teachers should be trained to teach critical thinking to students (Forawi,2016). Thus, schools shall have dedicated critical thinking development plans based on the gap analysis of the individual teacher and yearly monitoring shall be done on the post assessment tests. Moreover, teachers shall have KPI (key performance indicator) in their annual targets to integrate critical thinking in the teaching strategies in their respective classes. Teachers shall be encouraged to take part in the professional development programs to develop their teaching skills of integrating critical thinking into the teaching strategies (Patton, et.al 2015).

Educators must endeavor to make the critical thinking objectives explicit in the curriculum and include them in the faculty development and teachers training. When the instructions are clear and direct, it enhances student's perception of critical thinking. (Forawi,2016). Moreover, it will be beneficial to build a curriculum that is enrich with critical thinking-oriented resources thus providing teachers with a critical thinking rich course content that enhances student's learning of critical thinking skills.

Critical thinking improves the achievement and performance of students not only in academics but also in real life. It allows them to focus on complex matters and hence witness the continuous growth by resolving the complicated issues. It fosters collaborative development, problem-based learning and other forms of active learning which enhances the teamwork. Thus, there shall be a systematic way to measure the critical thinking skills of the students that can be effectively monitored by applying the recognized international critical thinking tests in the education system The main purpose of the international critical thinking skills tests is to monitor the level of student's critical thinking and helps to further develop programs to improve student's critical thinking skills.

Critical thinking brings transformation in all sectors including education at all levels .Not only it has shown tremendous results around the globe, the drive has received strength as a result of increasing concern among teachers, administrators and educators that students must learn the critical thinking skills to resolve the complex issues of the modern world.Thus,critical thinking transform classroom learning environment from a traditional way which overlooks thinking to that which concentrates on innovative and creative way of thinking. The main aim of the education is to prepare the future generation for the challenges of life and that can be achieved effectively if the students learn the critical thinking skills that improves decision making and enhances innovation and creativity.

5.4 Limitation of the study

The sample size of current study is relatively small. Therefore, in future studies should take a larger sample size to have a better understanding and a complete view. Future research should include a greater number of participants and a greater number of schools so as to further generalize the results achieved so as to build up much stronger conclusions. The questionnaires of the study are self-administered by dint of this may be have more mistakes and error in the data collections and summarizations. The future studies should concentrate on the longitudinal study design, which assist them to comprehend the impact and its associating factors with passage of time. The present study is limited in factors affecting critical thinking and students learning methods, but future studies should include more factors and variables.

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Appendices

Appendix 1: Permission Letter

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11/8/2018

To Whom It May Concern

This is to certify that Ms.Sumiya Waqas with Student ID number 20160307 is a registered part-time student in the Master of Education from the Faculty of Education offered by The British University in Dubai since January 2017.

Ms. Waqas is currently collecting data for her research (Does Private Schools in Dubai Foster Critical Thinking)

She is required to gather data through conducting surveys that will help her in writing the final research. Your permission to conduct her research in your organisation is hereby requested. She would like to conduct a research on critical thinking in education. Further support provided to her in this regard will be highly appreciated.
Any information given will be used solely for academic purposes.

This letter is issued on Ms.Waqas's request.

Yours sincerely,

Dr. Amer Alaya
Head of Student Administration

Appendix 2: Student's Questionnaire

ID NUMBER: (Grade-Section-#)

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. ☐ Male ☐ Female
2.	Age (years) _____

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 ☐

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

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 3: Teacher's Questionnaire

	This part is general information about you **Male** ☐ **Female** ☐					
	Age (Years)					
	Questions	**Daily (Every Class Day)**	**Frequently (most class days)**	**Sometimes (About half of class day)**	**Occasionally (a few class days)**	**Not at all**
1	Present questions for discussion that have no clear right or wrong answers					
2	Ask students to develop opposing or corresponding arguments					
3	Organize class to work in small groups					
4	Ask students to share their work with others for reflection and improvement					
5	Use brainstorming, as a class or among groups of students, to produce new ideas					
6	Accept all student's valid responses					
7	Incorrect student respond elicit encouraging, supportive comment.					
8	Use models or visuals to represent complex ideas					
9	Discuss significance of the lesson - personally, locally, nationally, or globally					
10	Encourage transfer of cognitive skills to everyday life with comments like" this will help you in everyday life in this way"					

11	Encourage students to use existing knowledge to generate new ideas or solve an unfamiliar problem					
12	Teacher ask students to clarify and justify response.					
13	Encourage students to guess or ask "what if" questions					
14	Teacher ask open ended questions with multiple answers.					
15	Act as facilitator of learning in the class					
16	Allows time to students to consider alternate point of view/solution					
17	Teacher asked students to explain their answers					
18	Solicit multiple and diverse points of view about a question or issue					
19	Teacher withholds correct response and encourages students to explore possibilities					
20	Help students break down complex concepts or problems into their component parts					
21	Discuss a real-world problem					
22	Ask students to work together to analyze and solve problems					
23	Frequently ask "why do you think so?" questions					

24	Teacher act as a facilitator of learning in the class					
25	Allows time to students to consider alternative point of view					

Appendix 4: Observation Report on Teaching Strategies

The following section refers to your frequency of use

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

	Teacher's Strategy	**Never**	**Rarely**	**Sometimes**	**Often**	**Always**
1	Teacher encourage students to express ideas from different point of views.					
2	Rote memorization is encouraged during lessons					
3	Students are encouraged to ask "what if "questions in the class					
4	Teacher encourages group discussion and activities..					
5	Teacher emphasizes more on the grades rather than effort.					
6	Teacher encouraged students to write answers from the textbook using the exact words.					
7	Teacher frequently use following phrases in the class: Not listening, Low grades, Not focusing, Not understanding etc.					

8	Teacher explain the lesson while reading from the textbook.					
	Student's learning methods	**Never**	**Rarely**	**Sometimes**	**Often**	**Never**
1	Students gather and organize relevant information to gain knowledge.					
2	Students consider ideas from multiple perspectives and from diverse point of views.					
3	Students justify thinking to teachers and peers					
4	Students rely frequently on the recall of the facts					
5	Students rarely get the opportunity to participate and express their ideas in the class.					
6	Student feel bored and feel reluctant to ask questions in the class.					
7	Students are motivated to study only for the grades					
8	Students rely on rote memorization					

Appendix 5: Observation Report on Teaching Methods
Teacher's teaching methods and students learning methods
The following section refers to your frequency of use
5=Always; 4= Often; 3= Sometimes; 2= Rarely; 1=Never

	What teacher does	Never	Rarely	Sometimes	Often	Always
1	Brainstorming was implemented by the teacher.					
2	Use model and simulations (video/science demo/experiment/acting out) to explore complex system and issues.					
3	Inquiry questions are prominent during class session.					
4	Short quizzes are given at the end of the lesson to retrieve student's knowledge...					
5	Students are asked to underline important sentences in the book					
6	Teacher collected the quizzes and said that he/she will grade them later...					
7	Students have been asked to listen to teacher's lecture as teacher will ask them a quiz at the end of the lesson.					
8	Students were asked to pay attention to the lesson as teacher will bring questions from the same lesson in the exam.					
9	Teacher constantly talk for 30 minutes about the lesson in the class					
10	Teacher asked the students to close their books, pay attention and listen.					

11	Teacher asked the students: "How will you answer the questions in the exam if you will not focus on the lesson"					
	What students do	**Never**	**Rarely**	**Sometimes**	**Often**	**Never**
1	Students are motivated and participate in class activities.					
2	Students start discussing with each other when a task is assigned to them in the class					
3	Students start answering in class discussion.					
4	Students passively listen to the teacher during lecture					
5	Students read from the textbook during class time.					
6	. Students check the answers with their peers					
7	Students close textbooks and listen					
8	Students start to underline the sentences using coloring pens, and most of them were looking at each other's book to do the same.					
9	Students are looking around and drawing in their textbooks					
10	Only few students raise their hands to answer in class					
11	Students do not participate during class discussion.					

Appendix 6: 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**				
	Excellent	**Very good**	**Good**	**Fair**	**Poor**
Cultivating a positive sociological learning environment in the class.					
Class activities to promote learning motivation among students					
Explicitly explaining the lesson objectives and goals to students					
Present suitable and correct information corresponding to students' learning level.					
Applying the information in the lesson to real life and environment.					
Teaching methods are very well organized, and teacher's knowledge is up to date					
Students are motivated to share their ideas in the class					
Students are motivated to reach to conclusions and explore possibilities.					
Students are encouraged to ask relevant questions in the class and promote self-learning					
Students are motivated to have a positive competition among peers					
Students are encouraged to build focus and concentration					
Teacher demonstrate good behavioral attitude with students					
Good and effective use of academic time in class					
Teacher gives immediate feedback to students					
Teacher effectively utilizes a variety of teaching aids like video/simulation/charts/experiments etc..					

Teacher train the students for self-evaluation					
Teacher utilizes variety of assessment methods (verbal, written, performance)					