THE EFFECT OF MULTIPLE-INTELLIGENCE AND MEDIATING ROLE OF THINKING SKILLS ON THINKING PATTERNS AMONG TENTH-GRADE STUDENTS IN PRIVATE SCHOOLS IN ABU DHABI

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SULTAN IDRIS EDUCATION UNIVERSITY

2021

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DISSERTATION SUBMITTED IN FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF DOCTOR OF PHILOSOPHY (PEDAGOGY)

(BY RESEARCH)

FACULTY OF EDUCATION AND HUMAN DEVELOPMENT
SULTAN IDRIS EDUCATION UNIVERSITY

2021

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ACKNOWLEDGMENT

Praise be to Allah (SWT) who said: {My Lord, enable me to be grateful for Your favor which You have bestowed upon me and upon my parents and to work righteousness of which You will approve and make righteous for me my offspring. Indeed, I have repented to You, and indeed, I am of the Muslims."} (Surah Al-Ahqaf, verse 15). Allah (SWT) also said: {'If you are grateful, I will surely increase you [in favor]} (Surah Ibrahim, verse 7). Moreover, it was narrated by AbuHurayrah that the Prophet (SAAWS) said: "He who does not thank Allah does not thank people" (Sunan Abi Dawud 4811). I thank Allah (SWT) for what He blessed and honored me for this work of research and granted me success in it. I would also like to thank my teacher and supervisor, Dr. Mohammed Yousef Mai for his advice, encouragement, understanding and a lot of support. He taught me to love and appreciate knowledge and scholars through his supervision and guidance. I am particularly deeply grateful to him for his time and patience. Furthermore, I thank all my lecturers at Sultan Idris University, the staff of the Education department, as well as the library and postgraduate institute staff (IPS). I also thank and appreciate the examiners for their comments and advice. Also, all thanks and appreciation to my family members for the suffering they suffered with me and their great patience throughout the work of this research. I thank everyone who helped me in completing this research. In conclusion, I pray to Allah to accept this thesis for His sake and to be a successful start. I do not claim that I have reached the top of knowledge, I have tried, but perfection belongs to Allah alone. I ask Allah (SWT) to grant us all success in what is in our goodness and contentment. All praise be to Allah, the Lord of the worlds, and peace and blessings of Allah be upon the Prophet Mohammed.

ABSTRACT

This study aimed at modelling the relationship between multiple-intelligence and thinking skills and its influence on developing patterns of thinking among the 10th-grade students in private schools in Abu Dhabi. The researcher used descriptive approach. Structure equation modelling was used in analysing correlation coefficients between variables to direct or indirect effects, as well as evaluating the relative importance of independent variables in interpreting the total variation of the dependent variable. The study sample constitutes of 350 students from five private schools in Abu Dhabi. The study used three instruments, namely Gardner's multiple-intelligence scale, the thinking skills scale, and the thinking patterns scale. Data were also analyzed using descriptive statistics, correlation coefficient and Amos. The results showed significant positive relationship between multiple intelligences (IV) and thinking patterns (DV) through critical thinking as the MV. A direct relationship was found between linguistic intelligence (IV) and thinking patterns (DV) (r=.284) as well as a positive relationship between social intelligence (IV) and thinking patterns (DV) directly (r=.241), natural intelligence (IV) and thinking patterns (DV) directly (r=.113), musical intelligence (IV) and thinking patterns (DV) directly (r=.270), and between bodily-kinaesthetic intelligence (IV) and thinking patterns (DV) directly (r=.470). However, in the case of creative thinking is the MV, the results showed that there is a significant positive relationship between social intelligence (IV) and thinking patterns (DV) directly (r=.241). While it was found between natural intelligence (IV) and thinking patterns (DV) directly (r=.113), musical intelligence (IV) and thinking patterns (DV) directly (r=.000), and between bodily-kinaesthetic intelligence (IV) and thinking patterns (DV) directly (r=.000). These findings reveal the relationship between multiple-intelligence and thinking skills and their influence on developing patterns. The study recommended conducting more similar studies in government schools, as well as in other school levels and in other academic levels.

KESAN KECERDASAN PELBAGAI DAN PERANAN KEMAHIRAN BERFIKIR TERHADAP CORAK BERFIKIR DI KALANGAN PELAJAR-PELAJAR GRED KESEPULUH DI SEKOLAH SWASTA DI ABU DHABI

ABSTRAK

Kajian ini bertujuan untuk memodelkan hubungan antara kecerdasan pelbagai dan kemahiran berfikir dan pengaruhnya terhadap pengembangan corak pemikiran di kalangan pelajar kelas 10 di sekolah swasta di Abu Dhabi. Pengkaji menggunakan pendekatan deskriptif. Pemodelan persamaan struktur digunakan dalam menganalisis pekali korelasi antara pemboleh ubah ke kesan langsung atau tidak langsung, serta menilai kepentingan relatif pemboleh ubah bebas dalam menafsirkan total variasi pemboleh ubah bersandar. Sampel kajian terdiri daripada 350 pelajar dari lima sekolah swasta di Abu Dhabi. Kajian ini menggunakan tiga instrumen, iaitu skala kecerdasan pelbagai Gardner, skala kemahiran berfikir, dan skala pola berfikir. Data juga dianalisis menggunakan statistik deskriptif, pekali korelasi dan Amos. Hasil kajian menunjukkan hubungan positif yang signifikan antara kecerdasan pelbagai (IV) dan corak berfikir (DV) melalui pemikiran kritis sebagai MV. Hubungan langsung didapati antara kecerdasan linguistik (IV) dan corak berfikir (DV) (r = .284) serta hubungan positif antara kecerdasan sosial (IV) dan corak berfikir (DV) secara langsung (r = .241), semula jadi kecerdasan (IV) dan corak berfikir (DV) secara langsung (r = .113), kecerdasan muzik (IV) dan corak berfikir (DV) secara langsung (r = .270), dan antara kecerdasan kinaestetik badan (IV) dan corak berfikir (DV) secara langsung (r = .470). Namun, dalam hal pemikiran kreatif adalah MV, hasilnya menunjukkan bahawa terdapat hubungan positif yang signifikan antara kecerdasan sosial (IV) dan pola berfikir (DV) secara langsung (r = .241). Walaupun didapati antara kecerdasan semula jadi (IV) dan corak berfikir (DV) secara langsung (r = .113), kecerdasan muzik (IV) dan corak berfikir (DV) secara langsung (r = .000), dan antara kecerdasan kinaestetik tubuh (IV) dan corak berfikir (DV) secara langsung (r = .000). Penemuan ini mendedahkan hubungan antara kecerdasan pelbagai dan kemahiran berfikir dan pengaruhnya terhadap perkembangan pola. Kajian itu mengesyorkan untuk melakukan kajian yang lebih serupa di sekolah kerajaan, dan juga di peringkat sekolah lain dan di peringkat akademik yang lain.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter provides a brief explanation of the study. It includes the background of the study, problem statement, research objectives, research questions, and research hypothesis. Also, it explains the conceptual framework, the significance of the study, the scope of the study, operational definition and summary.

1.2 Background of Study

Multiple-intelligence is a new concept that many teachers might be unaware of, and they still think that intelligence is one type only. Any student has strong and weak intelligence

capabilities. The strong intelligence capabilities of the students must be used to train their weak capabilities. For example, a student who is weak in math concepts may understand them better if they are embodied musically, and students who are weak in language arts skills can express things through drawing (Jayaseely, 2020). Teachers have to understand the different types of intelligence to help students discover how to use their multiple intelligences in the taught lesson. Besides, teaching them the practical applications needed to enhance and improve the weaknesses in their intelligence abilities and give them the opportunity to use their intelligences in the classroom.

Teaching thinking skills is an important goal of education. Schools should do everything they can to provide thinking opportunities to their students. Moreover, many teachers consider the task of developing the student's ability to think as an educational goal that they place at the top of their priorities (Jarwan, 2007). Developing thinking would develop the learning (educational) process, as it makes students more aware of their mental processes.

Asqool (2009) explained that thinking can be developed within the framework of education which aims at forming the critical mentality of the students, so that they can judge the ideas and perceptions to mentally determine their consistency and harmony. However, critical education is opposed to the conventional teaching; the latter refers the person to a pot where every creative interaction gets shut down, and the only way to integrate into society is to totally accept the perceptions and to comply with the provisions imposed by society, with loss of the ability to revise preconceptions or produce new ideas. (Asqool, 2009)

Those who are interested in the education field should stay away from indoctrination as much as possible, because it is a major impediment to all mental and psychological agitations and the main reason for obedience and submission. Our true religion urged us to think and encouraged the use of intellect. Furthermore, thinking is regarded as one of the main reasons for the Islamic call/preaching. Allah (SWT) says in The Holy Quran: {And it is He who spread the earth and placed therein firmly set mountains and rivers; and from all of the fruits He made therein two mates; He causes the night to cover the day. Indeed, in that are signs for a people who give thought} (Surat Al-Ra'd, verse 3). The Holy Qur'an contains many verses that urge us to be rational, to think, to use reason, and to contemplate the creatures of Allah.

Abdel-Lateef (1989) showed that Islam gave thinking a high status and an important role in religion and the world. Thus, it can be said that thinking is one of the characteristics of the visionary believer, and this fact requires Muslims to respect this divine capacity that Allah (SWT) gifted to mankind. They should know its dimensions and nature and work on its development as much as they can (Abdel-Lateef, 1989). Also, specialists and educators have agreed upon the need to teach thinking and develop thinking skills for all students, and at their different stages, and this necessity is confirmed by two things, first, considering thinking as a skill, and second, determine which skill required to be acquired in education. Thinking is a complex and multifaceted process and is influenced by many factors and it passes through many obstacles and thorns (Al-Suhaimat, 2010).

Al-Shamsan (1996) explained that while information becomes old, the thinking skills are new, and thus, thinking is the tool by which one directs the variables of the era, and consists of the individual's tendencies, beliefs and outlook of surroundings. Therefore, the

interest of societies has become focused on the development of people's thinking skills. Despite the technical development, there are indications that some individuals are still practicing the wrong and irrational ways of thinking and this leads to the emergence of contradictory and wrong concepts and developments, which impedes the intellectual progress of the communities. (Al-Shamsan, 1996)

Atiyyah (2015) noted that the academic failure of university students is due to their inability to think abstractly in solving problems efficiently. In addition, (Schafersman, 1991) pointed out that the low level of thinking among students is due to what teachers do in the classroom, i.e. the deficiency in transferring the academic content in various specialties, like (What to think about?) while it is supposed to be based on the understanding and evaluation of the scientific material (How to think?). Also, Hardadek noted that every student can learn how to think if he/she was granted the opportunity of training and actual adequacy practice (Atiyyah, 2015). The development of thinking skills is considered a fundamental pillar and cornerstone of all aspects of educational learning, because it prepares students for future life and qualifies them to be good and productive individuals.

Al-Otaibi (2007) stated that thinking skills must be learned through human sciences in order not to be misused. Feuerstin has applied the instrumental enrichment program, which is one of the worldwide programs to develop thinking skills, it relies on independent subjects that are not based on a specific context, and its results showed a great ability to the non-verbal deduction and this proved that thinking can be taught (Al-Otaibi, 2007). On the other hand, Ruzouqi and Abdel-Karim (2015) pointed out that thinking is a goal of education, and thus, the development of thinking is an important educational function for all institutions to help the learner in dealing with this era of information, which requires individuals with

mature mentality, objective outlook of ideas and attitudes, and search for reasons and evidences. Thinking is a necessary process to establish a democratic life and achieve scientific and social progress. (Ruzouqi & Abdel- Karim, 2015)

Jarwan (2014) emphasized that the importance of thinking is that it is vital to discover the universe and has a great role in life and learning success. It also improves the student's achievement level and gives him/her a sense of control over his/her thinking stemming from the achievement level which makes him/her feel confident. The elements of thinking include visualization, imagination, symbolizing, muscle activities and brain functions. However, educators see that the elements and tools of thinking are to expand the student's horizons by looking at ideas including the pros and cons, organizing the ideas of the learner through analyzing the problem to primary and secondary procedures, identify the similarities and differences between the phenomena as well as the interaction between ideas, and provide the environment that helps to stimulate thinking. Educators agreed upon the following thinking patterns: scientific, empirical, logical, high-level, creative, critical, analytical, deductive and reflective thinking. (Jarwan, 2014)

Abu-Hashim (2005) pointed out that the interest in the development of creative thinking is one of the priorities of educational issues in the Arab world. Many studies and researches emphasized the role of the teacher in developing creative thinking among students, including the International Conference on Thinking (1997) and Education Curriculum and Development of Thinking Conference (2000). The Development of Arab Creativity Community made a training workshop that included the development of creative thinking skills and the importance of developing the human mind. The theories of mental formation, which tried to interpret intelligence, differed, reflecting the believers' visions of

these theories of mental formation on one hand as well as reflecting the developments of methods of measurement and evaluation, and the statistical methods used on the other hand, where psychologists took a variety of ways to understand intelligence and its nature (Abu-Hashim, 2005). Multiple intelligences are not limited to one or two types of intelligences, but rather to several types of intelligences that include many aspects of students' lives, whether in school or practical life.

Also, Hussein (2012) noted that intelligence does not have one fixed ability measured by single measure to be determined. However, multiple intelligences are not just preparations, abilities or talents. To illustrate, Gardner suggested at the evolution of multiple intelligences that each individual possesses these intelligences in varying degrees and has a unique combination of these intelligences that can be improved to varying degrees. Moreover, Gardner showed in his book "Frames of Mind" a new concept of intelligence as an ability of solving the problems faced by the individual with unique and creative abilities that solve the problems creatively in natural situations. (Hussein, 2012)

Furthermore, Gardner considered that thinking is the processes of the mind in handling the situation content to reach a solution. According to him, a learning style is the group of intelligences and thus, the development of one or all of them facilitates the thinking processes of students. However, Gardner has criticized the intelligence tests that measure intelligence as a general mental ability (IQ), and considered to be culturally biased, because they measure only two types of intelligences, which are linguistic and mathematical, and he argued that there is no one intelligence, but multiple-intelligences. The intelligence measured by traditional methods defines one area, while multiple-intelligences are psychological abilities that influence and develop the individual’s motivation, experience and cultural

factors. Also, Fasko (1992) suggested that the results for multiple intelligences-based programs are bigger and better and students with learning disabilities can improve better (Al-Khafaf, 2010).

Bara'edah (2012) explained that multiple intelligences proved their effectiveness in taking into account the individual differences, raising the students' level of achievement, expanding the teacher's teaching strategies, taking into account the different intelligences of students and their learning styles, and providing plans and teaching methods that grow the different sides of students' intelligences. (Bara'edah, 2012)

1.3 Problem Statement

Thinking skills are among the most important goals that educational institutions seek to achieve. Thinking and its skills are of great importance in students' lives, so thinking is a catalyst for the students' ability to pay attention, making them able to participate effectively in various situations and encourage them to continue research processes, which ultimately leads to reaching new information and makes the student more willing to move away from wrong habits and behaviors. Also, thinking skills make students more receptive to new ideas so that they become more flexible and adapted to the surrounding environment. Developing students' skills and thinking abilities increases self-confidence and makes them more positive in communicating and dealing with people around him (Zaitoun, 2003).

Education that neglects thinking skills builds knowledge for students through indoctrination and memorization and neglecting all activities that build the student's

experiences. Also, neglecting thinking in educational institutions lead to neglecting every activity outside the classroom and neglecting the development of positive trends and tendencies. This leads to a reduction of similar learning opportunities for all students, because the construction of tests is limited to retrieving only memorized information and neglects individual differences. Thus, it affects the level of quality education that the student needs in the future. (Langer, 2004)

Teaching thinking should be based on the multiple-intelligence theory because it has dealt in depth with all types of intelligence a student could have. The main problem is that many teachers are unaware of this new theory (Jayaseely, 2020). Since the sixties of the twentieth century, the voices of those interested in education in a number of developed countries have called for the need to review school education and direct it towards developing thinking skills and developing the multiple-intelligence among school students. This is due to the negative effects of the lack of interest in teaching thinking, which includes the inability to adapt to the surrounding environment and this negatively affects the development of plans as the student is an important social pillar of the acceleration of progress. It also affects the student's ability to find solutions to problems and limit his abilities and inability to discover himself, which affects his ability to make decisions, limits the student's acquisition of new experiences. Thus, limits his ability to insight, imagine, judge things, and not feel the joy of achievement and discovery. (Qawasmah and Abu-Ghazaleh, 2013)

Many studies, including Al-Sumaili's (2011) study, have indicated that there are deficiencies in thinking patterns and skills among students. Moreover, the study of Al-Qallab et al. (2006) has also shown that teaching thinking through the study materials is not

sufficient, as well as the study of Qatami and Melhem (2013) indicated that taking care of students' thinking in school is a necessity. They also mentioned the low level of thinking patterns and skills among students. Furthermore, the study of Al-Saliti (2006) and Al-Atoum (2004) confirmed that huge numbers of students who are graduating from schools without any experience in dealing with problems and finding solutions and they do not have the ability to make decisions, because the learning process is limited to remembering, memorizing, and recalling information while it is being processed.

Moreover, it is necessary to develop educational policies and use strategies and means to enhance thinking in the classes. Many studies have indicated the best educational methods that contribute to the development of thinking patterns among students and the application of multiple-intelligence in the classroom. For example, Yamin (2013) and Tayeh (2016) pointed out the need to base the educational process on the theory of multiple-intelligence. Howard Gardner's theory on multiple-intelligence is an excellent framework for developing students' thinking and taking into account the different thinking styles and skills. Multiple intelligences have not been integrated into the educational curricula. This is confirmed by the study of Al-Khuzaie and Al-Amrani (2013) that the use of learning strategies based on multiple-intelligence in the classroom at an early stage allow students to develop thinking skills and patterns. Thus, students have the ability to make decisions and solve problems, which leads to meet their educational needs and life skills and acquire new experiences to keep pace with the wheel of development.

There is a need to refer to the annual report of the Knowledge and Human Development Authority in the United Arab Emirates, which revealed the results of school control process over the past ten years. The results showed common features between private

schools with acceptable or poor performance. One of these features is the lack of focus on active and practical learning that encourages thinking and creativity, which leads to depriving many students of developing thinking skills and high-quality independent learning. Also, minority of teachers did not plan to offer activities based on thinking patterns' strategies. Moreover, teachers do not possess the necessary proficiency in using questioning methods in a way that enables students to achieve a deeper understanding and enhances their thinking skills. They do not initiate open-ended problems and applications for their students during classes and assessments. (Knowledge and Human Development Authority, 2011)

Hence, this problem in private schools in the UAE affects the students' ability to find solutions to problems and limits their abilities and inability to discover themselves, which affects their ability to make decisions, which limits the students acquisition of new experiences and ability to insight, imagine, judge things, and not feel the joy of achievement and discovery. Thus, it affects the level of quality education that the students need in the future. Therefore, the researcher believes that there is a need for conducting this research and verification of the development of thinking patterns through the relationship between multiple intelligences and thinking skills in Abu Dhabi private schools.

1.4 Research Objectives

This study has four main objectives as follows:

1. To determine if there is an effect of relationship between multiple-intelligence and thinking skills in developing thinking patterns among 10th grade students in private schools in Abu Dhabi.

2. To determine if there is an indirect relationship between the study variables i.e multiple-intelligence (IV), thinking skills (MV) and thinking patterns (DV) among the 10th grade students in private schools in Abu Dhabi.
3. To investigate whether the proposed model can be used to explain the relationship between the study variables i.e multiple-intelligence (IV), thinking skills (MV) and thinking patterns (DV) among the 10th grade students in private schools in Abu Dhabi.

1.5 Research Questions

This study will investigate the following four questions:

1. Is there an effect of relationship between multiple-intelligence and thinking skills in developing thinking patterns among 10th grade students in private schools in Abu Dhabi?
2. Is there an indirect effect of relationship between the study variables i.e multiple-intelligence (IV), thinking skills (MV) and thinking patterns (DV) among the 10th grade students in private schools in Abu Dhabi?
3. Can the proposed model be used to explain the relationship between the study variables i.e multiple-intelligence (IV), thinking skills (MV) and thinking patterns (DV) among the 10th grade students in private schools in Abu Dhabi?

1.6 Study Hypotheses

1. There is an effect of relationship between multiple-intelligence and thinking skills in developing thinking patterns among 10th grade students in private schools in Abu Dhabi.
2. There is an indirect relationship between the study variables i.e multiple-intelligence (IV), thinking skills (MV) and thinking patterns (DV) among the 10th grade students in private schools in Abu Dhabi.
3. The proposed model can be used to explain the relationship between the study variables i.e multiple-intelligence (IV), thinking skills (MV) and thinking patterns (DV) among the 10th grade students in private schools in Abu Dhabi.

1.7 Conceptual Framework

The conceptual framework of the study is based on Howard Gardner's Multiple Intelligence Theory:

Gardner's states that intelligence has eight types and has identified two characteristics common to all eight types of intelligence:

1. It is not only hereditary; it can also be acquired and developed.
2. It can be learned and trained on.

This theory sees that the multiple intelligence of each individual works independently, as you also see that each individual specializes in a single or combination

of these types of intelligence that some call (an intelligent imprint) which he uses in his dealings, and in his confrontation of the various situations and problems that he is exposed to in life. Also, everyone can develop their multiple-intelligence or take it to a higher level if they have the motivation and the appropriate encouragement and training (Al-Maloul, 2016).

Hussein (2012) stated that the classification of intelligences expresses certain characteristics, but it does not mean that individuals can be classified on the basis that they have certain traits and no other traits. Each individual has all the intelligences but they vary in different levels from one person to another. For example, a weakness in the ability to speak or write in an individual does not necessarily mean he has a weakness of linguistic intelligence, but he may have another intelligence that is used as an input to develop his linguistic intelligence.

The theory of multiple intelligences assumes that there is no educational method or educational strategy that can be offered to all students at all times due to the different levels of multiple intelligences each one of them has, using specific strategies may be highly successful with a group of students or less successful with other groups. In order to address the individual differences among students, it is recommended that a wide range of instructional strategies be used to match students 'intelligences to effective learning and to deepen understanding. The teacher can identify students' intelligences and accordingly use appropriate activities as instructional interventions that fit those intelligences (Al-Hashemi, 2013).

The origin of the multiple intelligences theory has begun in 1979, when Van Leer Foundation asked Harvard University to conduct a research on the evaluation of scientific knowledge and mental abilities of individuals and to demonstrate their effectiveness in different life situations. Thus, many researchers have carried out exhaustive research for many years, including Gerald S. lesser who is a psychologist, Gardner (a specialist in cognitive psychology), Scheffler and Robert La Vine who are specialists in social anthropology, and Merry White who is specialized in education in the Japanese society. The research and studies included the cognitive and mental fields and the exploration of the extent to which this potential was activated practically in reality. They conducted research in human history, science, philosophy, natural sciences and humanities. Also, they conducted many periodic scientific meetings to discuss human development issues in different cultures (Khedr, 2015). Table 1.1 below shows a summary of the multiple intelligences theory.

Table 1.1

A summary of the multiple intelligences theory

Intelligences	Basic components	Symbolic signs	Future career (Known characters)
1. Linguistic	Sensitivity to sounds, language, structure, meanings and functions	Linguistic studies and the sound of letters in pronunciation, such as English and Arabic.	Writer and orator, such as: Martin Luther King, Abbas Mahmoud Akkad and Charles Dickens.
2. Logical/ Mathematical	Sensitivity to arithmetic and logical operations with numerical indications and long indicative chains	Computer programming and languages (e.g. Pascal language)	A mathematician and software scientist, such as Al-Khawarizmi, John Dewey and Einstein

3.	Spatial	Visual perception of the world and the ability to correctly and accurately visualize spatial	Imagination and Accuracy	Architect: Reem Colhas
4.	Bodily-Kinesthetic	Express of thoughts using consistent and skilled body moves	Symbolic languages, such as sign language and gestures	Actor, athlete, storyteller, dancer like: Michael Jordan
5.	Musical	The ability of the person to taste musical melody, rhythm and verbal harmony	Musical tunes and rhythm of musical instruments.	Composer, Musical Instrument Maker, Lyrics Writer (Michael Jackson)
6.	Interpersonal (Social)	Capability of understanding personalities and moods	Body language such as: facial expression and insinuations	Political analyst, military leader and social reformer, such as Mother Teresa
7.	Intrapersonal (Self)	Able to understand himself and his emotions and focus on his strengths and weaknesses	Self-programming	Psychologist and therapist, religious reformer, (Freud, men of religion)

The following framework shows the relationship between the variables of the study (i.e. multiple- intelligence, thinking skills, and thinking patterns). Then, figure 1.2 shows the model that the study hypotheses were derived from.

The studies conducted by (Abdi & Rostami, 2012; Widiana & Jampel, 2016) confirmed that there is an influence of multiple-intelligence in the development of thinking skills, where the studies showed that creative thinking can be developed in middle school students by training students to enhance thinking skills and applying motivational programs, such as modern multiple-intelligence programs that encourage innovation and learning based on multiple intelligence. Also, the study conducted by Yi,

Sulaiman & Baki (2015) confirmed a relationship between multiple-intelligence and the development of creative thinking skills.

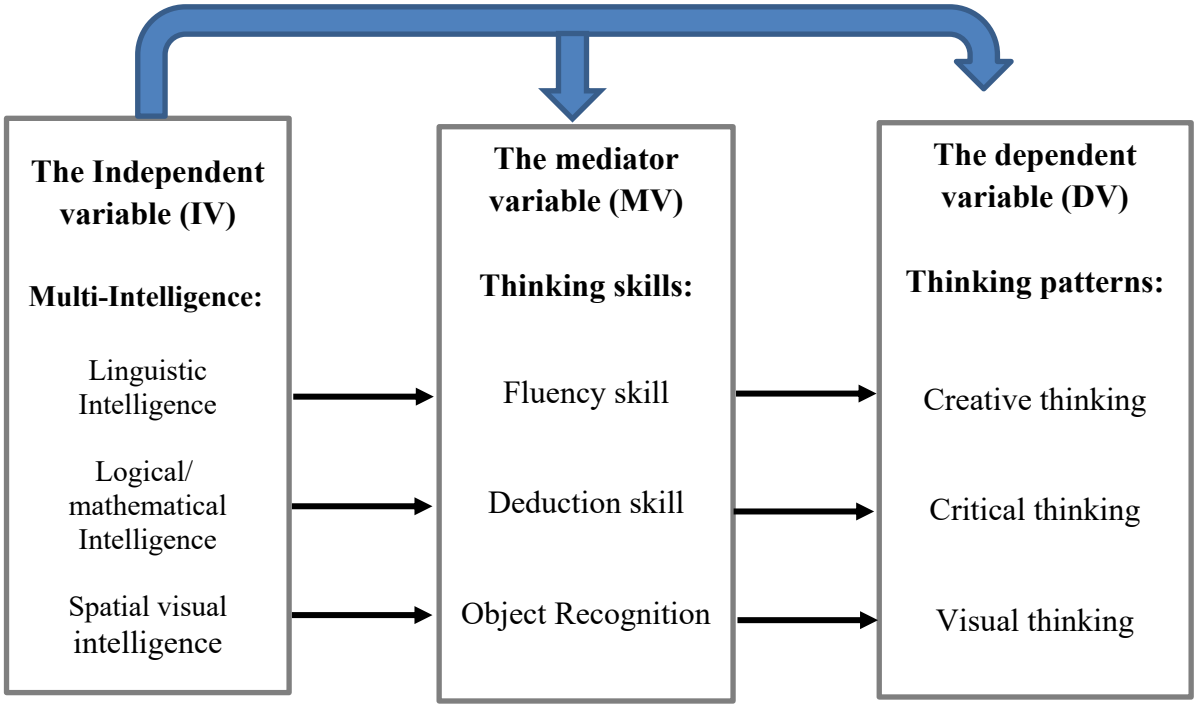

Figure 1.1 Conceptual framework of the study

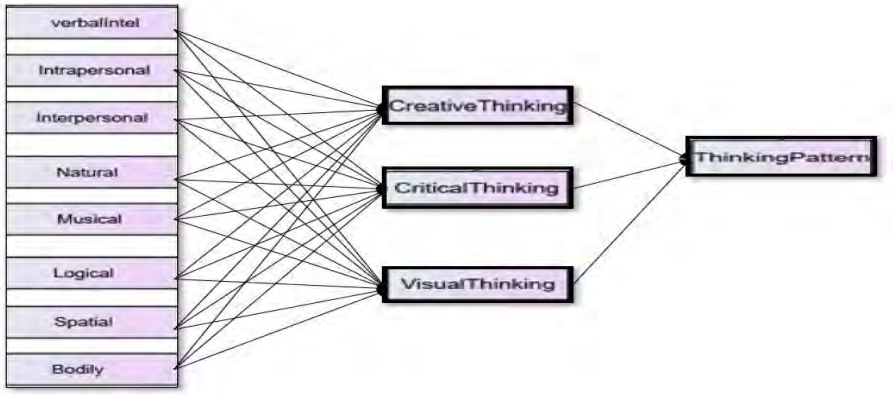

Figure 1.2 Model of the study

1.8 Significance of the Study

The significance of the study in scientific and practical aspects can be summarized as follows:

Practical significance: Provide feedback to those who train teachers and prepare professional development programs at the actual practice level for the development of multiple intelligences, thinking skills and thinking patterns, which will help them to rethink of some teachers' training and preparation programs. Moreover, it helps workers in teaching and education field to provide training programs, guidance and mentoring for secondary school students. Also, it assists decision-makers in developing policies and strategies that contribute to the development of educational curricula in line with the abilities and needs of secondary school students.

Theoretical significance: This study may contribute to conduct other studies related to multiple intelligences, thinking skills and thinking patterns at other study grades/levels. To clarify the relationship between the variables of the study, including multiple intelligences (independent variable), thinking skills (mediator variable) and patterns of thinking (dependent variable) among grade 10th students. Also, to clarify the modelling of the relationship between multiple intelligences (independent variable), thinking skills (mediator variable) and patterns of thinking (dependent variable) among grade 10th students. This study may encourage other researchers to study this topic and its relation to some variables in other environments, curriculums and levels of study.

1.9 Study Limitations

The current study is determined by the following variables: multi-intelligences (IV), thinking skills (MV-mediator) and thinking patterns (DV), and is also determined by the nature of the sample used in the study, which is 'grade 10' students in private schools in Abu Dhabi-UAE. Time limitation: The study procedures began in year 2016 and will be completed during year 2020.

Human limitation: Grade (10) students (males and females) in private schools in Abu Dhabi-UAE.

Spatial limitation: Private schools in Abu Dhabi / United Arab Emirates.

Objectivity: Exploring the relationship between multiple intelligences and thinking skills (deduction, discrimination of shapes and verbal fluency), and thinking patterns (visual, creative and critical) among Grade (10) students.

Determinants of the study: The results of the current study will be generalized according to a set of determinants related to the study instrument and the sample to be applied on as follows: What is provided to the instrument of the study has acceptable coefficients of validity and reliability, which will be calculated through the sample of the pilot study (not the study sample) but from the same population.

1.10 Study Terminologies

The researcher believes that there are important terms mentioned in the current study, and need to be clarified and defined.

Intelligence: It is a latent mental ability to process data that can be activated in a cultural environment to solve problems or to create valuable products for a particular culture (Wafi, 2010).

Multiple Intelligences: Gardner (1983) defined it as a set of skills that enable an individual to solve the problems he/she encounters in life (Ar-Rubaie, 2011). On the other hand, Jaber (2003) defined it as differentiated mental skills that can be grown and developed, which Gardner had figured them out (mathematical, spatial, musical, interpersonal, intrapersonal, natural and linguistic intelligences).

The operational definition of 'multiple Intelligences' is: The score that the examinee gets in the multiple intelligences' test used in the current study.

Thinking: It is defined as a complex knowledge process that involves information processing, based on the use of symbols, perceptions, language and concepts to reach certain outcomes (Rasha, 2017). Thinking is a mental treatment of sensory inputs that leads to the definition and judgment of things (Costa, 1985).

Thinking patterns: The mental processes of thinking can be classified into groups to distinguish each type from the other. Perhaps the multiple types of thinking are evidence of the increasing interest of researchers in studying it. According to some researchers, thinking is classified into correct and incorrect thinking patterns, as well as patterns based on analogous pairs, including (divergent and convergent thinking, inductive and deductive, innovative and critical, realistic and imaginative, formal and informal, creative and high level, logical and scientific, contemplative and successive, visual and analytical, and tangible and abstract thinking).

The operational definition of 'thinking patterns' in the study is: The score that the examinee gets in the thinking patterns' test used in the current study.

Critical thinking: It is the thinking that makes the learner subject the information to analysis, sort and test to determine a suitable level of information in order to distinguish between wrong and sound ideas (Atiyyah, 2015).

Thinking skills: Wilson defined them as mental processes performed by the brain to collect, store, or save information through analysis, planning and evaluation processes, reaching to conclusions and formulating decisions. Also, Atiyyah (2015) defined it as mental processes that intentionally process information and data to achieve different educational objectives, including remembering information, describing things, and stabilizing observations, predicting, classifying things, evaluating evidence, solving

problems, and reaching results (Atiyyah, 2015). Thinking is the overall process by which the brain processes sensory inputs mentally to form ideas. However, thinking skills are specific mental processes that are used to deal with the information and data presented in a situation, such as problem identification skill, and setting assumptions …etc.

The operational definition of 'thinking skills' in the study is: The score that the examinee gets in the thinking skills' test used in the current study.

Secondary School Level:

It is the last stage of compulsory education received by all students, after passing the basic education stage of primary and middle/intermediate grades. It is the stage that determines the university major or specialization that the student will join after high school graduation, or the profession to be learned later. The so-called higher education or secondary schools often begins during the teenage years.

1.11 Summary

This chapter provided a brief explanation of the study. It has included the background of the study, problem statement, research objectives, research questions, and research hypothesis. Also, it has explained the conceptual framework, the significance of the study, the limitation of the study, and operational definitions.