A Dissertation on

" The Impact of Teacher Professional Development on Student Achievement "

<div dir="rtl">دراسة حول اثر التدريب المهني للمعلم علي المستوي التحصيلي للطلاب</div>

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To My Parents

This research is dedicated to my loving parents. Without their encouragement, wisdom, and guidance, I would not have the goals I have to strive and be the best to reach my dreams!

To My Husband

This research is dedicated to my husband for his support and patience with me while doing my masters and writing my dissertation.

To My Family

This research is dedicated to my brothers and sisters for their support and prayers that helped me a lot to accomplish this great step in my life.

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Abstract

Teachers have a powerful long-lasting influence on theirs students. They directly affect how students learn, what they learn, how much they learn and the way they interact. Considering the degree of teachers' influence as educators and researchers we must understand what teachers should do to promote student positive results and classroom attitudes. Undoubtedly, teacher training plays an active role in maximizing the impact of teacher instructional practices on students' achievement (Darling Hammond, 2001; Jacob, Brian A., and Lars Lefgren. 2004).

High Quality professional development is one of the necessary tools for improving teacher effectiveness. This research has examined the impact of teacher professional development on students' achievement. The researcher has analyzed the scores of 231 students in three high schools in government sector prior, during and after a teachers' training program on infusing critical thinking skills in English curriculum. Participants of the research are all from Grade 12. The researcher carried out a quantitative research applying a quasi-experimental approach and a series of tests to investigate the influence of teacher training on students' scores. The research reveals that there is a negative impact on the scores and interestingly, it seems that as the training program and implementation of this program progress the average is declining. The overall design of this quasi – experimental research is implemented to examine this impact and to measure the changes in students' behavior and performance. The statistical analysis implies a negative impact on students' average and Standard Deviation across the three schools. There are limitations to the research such as:
The gender of the participants, the implementation of the professional development program, the assessment and the administration practices. The researcher offers some recommendations and suggestions to improve the quality of teacher professional development and students' performance as well

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ملخص البحث

" مما لا شك فيه, أن تدريب المعلم يلعب دورا فعالا في تحقيق ألاثر الأكبر علي ممارسات المعلم الصفية والتي تنعكس ايجابيا علي نتائج طلابه.

" دارلنج هاموند "2001

ان التدريب المهني عالي الجودة لهو أحد العوامل الضروريه لزيادة اثر االمعلم و ان البحث موضوع الرساله يختبر اثر تدريب المعلم علي المستوي التحصيلي للطلاب حيث ان الباحثة تقوم بتحليل نتائج 231طالبة في ثلاثة مدارس ثانوية في القطاع الخكومي قبل وخلال وما بعد اجتياز المعلمات لبرنامج التدريب المهني علي كيفية دمج مهارات التفكير الناقد في المحتوي الدراسي لمقرر مادة اللغة الا نجليزية في الصف الثاني عشر.

قامت الباحثة بتطبيق منهج البحث العلمي من خلال توظيف عدد كبير من الاختبارات الدقيقة للتحقق من مدي تاثر نتائج الطلاب بنوعية البرامج التدريبية التي تتلقاها المعلمات.

لقد توصل البحث الي عدة نتائج توضح العلاقة بين المعلمين ونتائج الطلاب والعوامل التي تؤثر غلي نوعية التغير ايجابيا كان او سلبيا.

يستعرض البحث كيفية تطبيق البرنامج التدريبي بالاضافي الي طرح تحليلا شاملا ووافيا عن مراحل البحث وخطواته ويقدم توصياته واقتراحاته التي تهدف الي المساهمة في تحديد مواصفات البرامج التاهيلية التي تحقق أثرا ايجابيا علي المستوي التحصيلي للطلاب.

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Chapter 1: Introduction

1.1   Overview

It is claimed that teacher quality is a key element in improving the process of teaching and learning in any educational system in the world. To achieve any desired reform goals teacher quality should be addressed to strengthen the existing teacher training programs and increase positively the relationship between teacher professional development and student learning outcomes and academic attitudes Harris and Sass (2007).

There is a significant literature on the correlation between quality of teacher training and student learning. Most pervious research has focused on teacher characteristics, knowledge and experience. Only few recent research focuses on the relationship between teacher professional development and its impact on student achievement and learning whereas it is obvious that certain teachers are more successful than others in improving student achievement and performance.

1.2 Background

The training program in this study is a one-year program that includes all secondary teachers of English in the country in Grade 12 female and male students. This study involves three Grade 12 female high schools with 231 students in both science and Art section.

Teachers were trained on how to infuse critical thinking into curriculum and how to assess student-thinking abilities. Teachers were provided with different teaching strategies and techniques to enhance improvement of student achievement and interaction. The paper investigates whether there is significant difference in student scores in three different time settings prior, during and at the end of the training.

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The Ministry of Education in UAE conducts on- going in-service professional development to provide new and current teachers with valuable opportunities to learn new knowledge and skills and provides teachers with opportunities to apply and implement the content of the professional program.

1.3   Methodology of the research:

In this paper, the researcher uses a Quasi-Experimental research to investigate the effectiveness of a professional development program conducted to improve students' achievement.

The major objective of the study is for school reform focusing on infusing critical thinking in government English curriculum. Quasi-experimental study is conducted to estimate the differences in the Mean and standard deviation. It attempts to examine the influence of an intervention on 231 grade 12 female students in three high schools.

To get the best evidences of whether or not the content of the professional development lead to the desired performance a set of tests are conducted. These tests provide the researcher with a number of comparisons that indicate the changes expected form the result and data analysis.

The scores are gathered though out three different time settings, analyzed and compared to interpret the effect of teacher training sessions. A quantitative research is implemented to utilize the quasi- experimental research, according to Sawchuk; most of the research conducted on professional development is qualitative rather than quantitative (2010).

Such research is conducted for school reform as a major aim; it is implemented to measure the effectiveness of the training program that is expected to lead to positive changes on both teacher practices and student learning outcomes.

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Findings of the analysis of the data of this study indicate that there is no positive effect of teacher training on student achievement in scores among the three schools participated in the training sessions. The conclusion chapter explains the results and interprets the reasons behind this positive impact. Recommendations are suggested to increase the positive impact in the future and to provide teachers with high quality training to accomplish the desired objectives

1.4   Statement of the problem

There has been very little research on training or professional development and its impact on student achievement in the United Arab Emirates and in the Arab World in general. Most of the studies emphasize on in-service training and the content of the training but no evaluation of the professional development outcomes. At present, no other studies have been found which focus on teacher training and its effectiveness.

The researcher examines an exist training program conducted by an organization sponsored by the Ministry of Education for teachers of the Secondary stage aiming at enhancement of positive reform in curriculum and assessment.

Previous studies of Ministry of Education researchers have focused on training teachers on new curriculum but no follow up procedures are carried out to assess the effectiveness of the training. It is a one year study to investigate the effectiveness of the training of Secondary stage teachers on improving students' thinking skills and problem solving abilities.

This study included 231 students from high schools in the country to investigate whether students are prepared standardized tests such as International English Language Testing System (IELTS) and Test of English as a Foreign Language (TOEFL), Common English Proficiency Assessment

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(CEPA) and finally diagnostic tests such as Password English Test. These international benchmark tests assess students thinking abilities and language skills and that is one of the major rationale for the decision made by the Ministry of Education in the country to infuse thinking skills into the current curricula. Teachers need a very systematic and focused training to accomplish the desired objectives of the professional development course that enhances these skills.

The researcher decides to examine if teacher training on some thinking strategies experienced during the one -year -training program has an effective impact on student achievement. The focus questions of the research may lead to an explanation of the changes in students' marks whether the changes are positive or negative and this is indicated in the results of the findings of analysis of results of students scores in three exams during three different time settings one prior the study and one after three months of the study in the first Term and finally at the end of the training program by a series of a Quantitative research using A quasi-experimental research. A series of comparisons are also made to support the findings and to justify the differences in results.

The researcher is interested in teacher professional development and enjoys examining the effectiveness of teacher training programs especially on students' scores and results as there are no studies in the country were conducted in the past on the impact of teacher practices on student achievement using quantitative research utilizing statistical analysis. Most of the surveys and questionnaires administered were all to investigate teacher satisfaction and opinion about a training program or about how beneficial the training was to them. The same training was given to all teachers without any need analysis or a real study of the objectives of the professional development.

It is prevalent in teacher professional development to have feedback sessions to study the relevance of the program to daily teacher classroom practices and to the curriculum. A lot of studies consider continuous teacher training as a major factor for school reform and development.

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Nowadays there is an increase of teacher professional development programs conducted by different organizations and presenters to create well prepared teachers and positive teaching environment which is very critical and vital in the application of training content into classroom practices.

The Quality of professional development is very important issue in education profession, teachers help students to acquire relevant skills as much as possible but assessment and professional development evaluation is required as well as continuous follow up and observations.

This study indicates and shows the importance of regular follow up and evaluation of classroom implementations and practices during and after the training. In addition to the evaluation, assessment, curriculum and content of training should be aligned to maintain the objectives of the training that affects students' achievement eventually.

1.5   Limitations of the study

Although this research was carefully prepared and data and results were cautiously studied and presented using different types of tests, the researcher is still aware of the limitations of the study.

First, The research was conducted in female schools not in male and female schools. It was easy for the researcher to visit female schools to collect the required data. The sample of students involved as participants in the study are all female students in grade 12, this applies to the teachers who are all female teachers and no male teachers are involved in the study as in the Secondary stage in UAE female teachers teach female students.

Second, though the population of the sample of the study is suitable to generalize the findings 90% of both students and teachers are UAE Nationals and about 10 percent of teachers and students are from other Arab nationalities. The sample might represent the majority of students in

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government schools but not the majority of students or teachers in Secondary Stage in the Private Sector.

Third, the research is designed to measure the differences in students results after the training session to investigate the impact of teacher professional program the use of other data collecting recourses and tools such as Teacher Questionnaires or interviews might provide more information about teaching strategies and the quality of the implementation of the content of the training program. Ministry of Education Supervisors who visit and observe teachers should have been included in the sample of the study using Questionnaires or interviews to collect enough evidences of teachers' and students' actual behavior and practices.

Finally, since assessment is one of the major factors the affected students' results in this study the researcher believes that examining all tools of assessment and evaluation would have been beneficial to form a comprehensive interpretation about the quality of the assessment tools and whether there is an alignment among training, curriculum and assessment. In fact the researcher analyzed Term Two End of Term Exam using Bloom's Taxonomy to examine whether the questions represent the higher levels of thinking such as analysis, synthesis and evaluation and the weight of knowledge and comprehension questions. The training program focuses on critical thinking and higher levels of thinking such as problem solving, comparisons, cause and effect and sorting.

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1.6   Significance of the study

Although this study has some limitations, it will add to the current research about teacher professional development in the United Arab Emirates. First, even though the results are only for female students the study helps to validate teacher training to make the desired changes in teachers' practices in general. Second, the findings of the study shed light on the quality of training required to accomplish the learning outcomes expected within this mode of teacher in-service professional development. Finally, the study highlights the importance of teacher formative and summative evaluation sessions and observations to assure the implementation of the content of the professional development program.

1.7   Organization of the Dissertation

This study is an example of the research on effective professional development and how it influences student achievement. It examines teacher Characteristics correlated with learning achievement and identifies the factors affect the scores and implies the effectiveness of the training program.

The research is divided into 5 sections. Section 1 introduces the context of the study. Section 2 reviews the literature on professional development and the studies that measure the impact of professional development. Section 3 describes the data and methodology used in this paper. Section 4 measures the impact and analysis the results of the data collected through sets of tests. Section 5 offers occlusion, implications and recommendations.

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Chapter 2: Literature Review

2.1 Overview

The teacher is the ultimate key to any educational reform and improvement and teacher training or professional development ultimately shapes the quality of teaching and learning. For many researchers improving teachers means improving teaching methods and teacher training involves more opportunities to change classroom practices and teacher quality.

Professional development indicates continuing learning prospects existing to teachers. Effective professional development is often assumed as fundamental to school success. It has also been criticized for the lack of data on students' performance and results. The aim of this chapter is to describe professional development, effectiveness of teacher training, and to identify the impact of professional training on instructional practices, and student achievement.
This chapter provides an overview of the research and issues summarizing the history of professional development and how it affects student performance and achieves all desired changes in their behavior. This section explores all previous research on models of professional development and how teacher instructional practices lead to effective reform in school culture and the quality of education in general.

The review of literature presents evidence to support the purpose of the study. The review describes the types of current professional development, the impact of these programs on the quality of teaching and learning. Second, it describes the characteristics of effective teacher and the hypotheses about the importance of utilizing professional development as a strategy for developing teacher awareness of effective pedagogy for better practices used in instructing. Effective teaching requires well - designed training programs for

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teacher to maintain effective teacher quality through teacher preparation. This alignment between teachers' preparation and its impact on the school culture and students performance remains reasonable.

This chapter determines the research on teacher preparation and training and reviews the background of effective professional development. It summarizes the relationship between teacher training and the impact of their classroom practices on the learning outcomes.

In fact there is little research regarding the effect of teacher training and its influence on the increase in overall student achievement.
 Firstly, it is believed that teacher preparation or even in-service training of experienced teachers can improve students' academic behavior. In addition, it is claimed that teachers with better professional development are able to provide students with more opportunities to learn.(Darling-Hammond& Aykes,2003)

it is also recognized that well trained teachers demonstrate stronger classroom management skills which enhances more learning (Ferguson& Wormack, 1993)

Many theories suggest that there is a positive relation between students' results and teacher professional development (Hanushek, 1971) .It is strongly believed that engaging teachers in well-structured training improves their classroom practices and performance as facilitators of the learning process. Cavalluzza, 2004 in a study conducted to examine the relationship between teacher training and student achievement advocated that there is evidence that students gained high marks in subjects taught by trained teachers.

Wenglinsky, 2002 found in a study on a teacher-training program that teachers have training in how to develop higher- order thinking skills help their students have higher achievement due to their engagement on relevant skills.

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According to Dewey learning is a process of doing, reflecting and learning and the major key to effective learning is experience. Research on professional development is distributed throughout subject areas focusing on classroom practices and teacher qualities.

This chapter measures the effectiveness of teaching on learning situations, quality and evaluation of professional program. It presents a number of researches and studies conducted to regenerate theories of teaching and learning processes and classroom practices (Richardson, 1999).

A comprehensive review of the literature based on previous research and studies reveals a variety of definitions of terminology related to professional development, models of teacher training, effective teaching and the impact of teacher training on students' achievement.

Due to the nature of the study and the material obtained in the research, few references are conducted to different studies in an attempt to focus on common knowledge. Topics of discussion include professional development and its impact on learning outcomes, successful teacher training and the need of on going evaluation and research for improving instruction practices and desired change in students' behavior and performance as well.

Effective professional development has different components to be addressed when evaluating professional development programs.

- Stakeholders who should be involved to guarantee the success of ant teacher training, teachers, administrators and parents should share the goals and objectives.
- Clear and concise objectives based on the needs of the school and subject.
- Planning includes objective, budget and technology.
- Resources are required to support the content of professional development program.

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- Support and Coordination to help teachers participate in their workshops and training.
- Reviewing, assessing and evaluating the professional program to improve the quality of professional development and the quality of teachers.

2.2 Brief History of the Professional Development effect

As mentioned previously, many researches were conducted to examine the effect of teacher training and students' performance. The review begins by making an attempt to investigate how and why teacher-training programs were devised. To begin this review it is preferred to study the history of professional development and teacher training in previous research conducted in different training fields and subject to identify a common definition of effective professional development or the development has significant impact on students' achievement accordingly.

Research on the relationship between teacher training and student achievement is has started in 1960s and emphasized generic teaching knowledge and skills such as classroom practices, assessing student understanding, and grouping students. These studies indicated small positive effects on students' skills (Brophy, Good, 1986). Student achievement was also increased when teachers are trained to follow the knowledge and skills presented in the training program whish are called as controlled practice (Good, Gowuws, 1979).

In 1990 1nother phase of study was conducted on a second type of professional development that emphasized student learning and how to enhance all related skills to improve learning through the change in the quality of teacher training and this type provides teachers with all required skills that focus on teaching and learning as two major elements for improving student achievement. It was claimed that teacher professional development could have a considerable impact on teaching practices and lead to the improvement of

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students' performance as the training sessions focused on many teaching and learning aspects.

The structured training strengthened teachers' knowledge in their academic content and instructional practices that related to their subjects and how to deliver the material to enhance better understanding. The main reason for this improvement measured in students' achievement was due to the alignment between the main objectives of the professional development program and the actual classroom practices.

Carpenter advocated that, in a study conducted to measure the impact of a training program for improving students' skills in Problem solving in Math, teacher training influenced the skills as teachers' knowledge improved. He related this to the fact that the training focused on subject matters and demonstrated how learning could be significantly influenced (Carpenter, 1989).

Paul Cobb determined that teacher training focusing on teacher knowledge based on improving methods of student learning strategies improved students' results at the end of the year of the study (Cobb, 1991). This implies that this type of teacher training proves the hypothesis says that teacher training positively influences learning. Research about the effect of teacher professional development in Mathematics dominated and leads all research in other subjects then it existed in science and teaching reading skills (Greenleaf , 2004) .

In a third study about the effect of teacher professional development in English to improve reading skills, Deborah McCutchen supported the fact that students in classes of teachers attended the one-year professional development programs on reading gained better results in reading and comprehension than students in other schools who were taught by teachers didn't receive the same training in teaching reading (McCutchen, 2002).

To provide teachers with effective professional development, teachers must be offered training on direct teaching strategies and practical activities to apply

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inside their classrooms. This professional development will lead to better teaching and will improve student learning as it links the curriculum guided by the standards, its delivery and the tools of assessment to evaluate and measure the significant difference in students results.

That was followed by two studies that strongly support the emphasis on the importance of professional development that enhances alignment between the curriculum and teacher actual instructional practices. Cohen and Hill indicated that teachers attend training programs focused on the curriculum and the practices applied in the professional development (Cohen, Hill, 2001).

In another study in the late 1990s, teachers tended to change their classroom teaching practices and improved their teaching knowledge and skills especially when the training is connected to their actual teaching and related experiences (Garet, 2001).

Recent research suggests that the more teachers are engaged in teacher professional development the more changes can be made in their practices and this will eventually affect student achievement (Parsad, 2001).

The time teachers spend in learning from their professional development makes a difference but when it focuses on actual classroom practices and when it is connected to the curriculum, learning, teaching and assessment as it is shown in in Figure 2.1.

Figure 2.1: The process of teacher development and its effects

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**Aspects of Teacher Professional Development
and Their Relationship to Better Instruction**
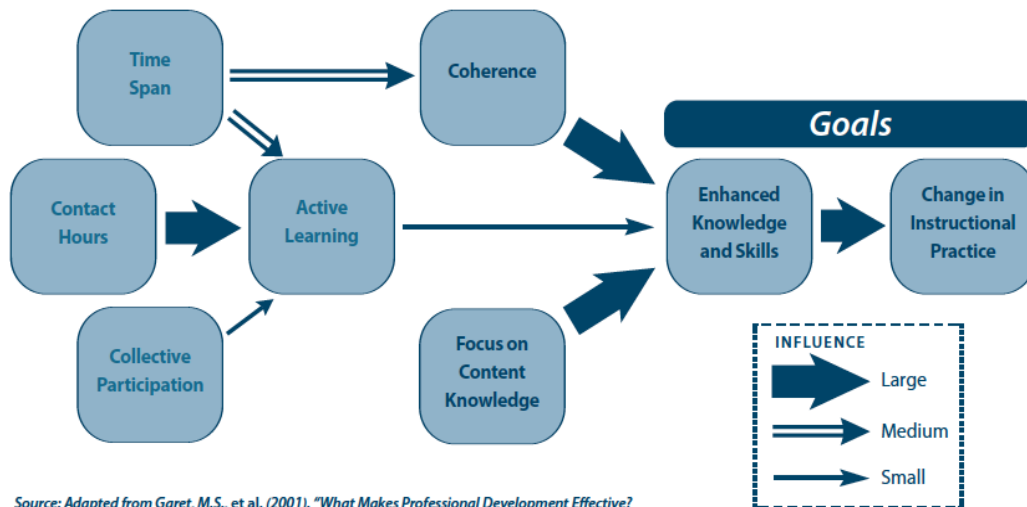
Source: Adapted from Garet, M.S., et al. (2001). "What Makes Professional Development Effective?
Results from a National Sample of Teachers." American Educational Research Journal, Vol. 38, No. 4
(winter), pp. 915–945. Figure 1.

According to the National Staff Development Council, 2001 many aspects were identified to guarantee the effectiveness of teacher training such as utilizing the time spent on training, focusing on the content Knowledge content and the goals or the changes required to be made in students performance to change learning skills.

The main issue was to identify the characteristics of effective professional development and to investigate the connection between the quality of teacher training and students achievement. Researchers and practitioners analyzed sets of characteristics of effective professional development the last decade.
The research presents list drawn by the American Federation of teachers, Education development Centre and National Institute of Science Education.

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They used different criteria to determine the effectiveness of teacher training programs and to investigate the relationship between the identified characteristics and any improvement in classroom practices and student achievement.

More than 21 features and characteristics of " effectiveness" of professional development, one of the most frequent features was focusing on knowledge content in training programs and that was clearly determined in Mathematics, science and in Language Arts.

Another vital dimension was time spent on training. It was mentioned that training requires sufficient time to enhance better understanding and developing teaching approaches but significant contrary evidence was detected.

The analysis of students' results in different subjects showed that time spent on unrelated activities affected student learning outcomes. It was clear that time in an important dimension but to achieve better results it should be organized and carefully structured and guided.

One of the noted dimensions is collaborative work and experience exchange. All opportunities of collaborative work among teachers in the training sessions is highly valued especially when teachers work together, reflect on their classroom practices and share ideas strategies.

Another important characteristic is the connection between professional development and teacher knowledge and awareness of recent and modern teaching methods and strategies that undoubtedly provides teachers with sufficient knowledge about theories of learning and styles of learning as well.

Ferguson and Womack believe that teacher quality has dramatic impact on student performance and scores (1993). A number of researchers point out that to effectively measure student academic achievement it is important to accommodate their needs and abilities of students. According to Valenzuela

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teacher's ability to influence students results refers to teacher quality and the form of professional training of the teachers (2005).

The research supports the relationship between the quality of teachers and the academic achievement. Darling Hammond, Ferguson and Womack assumed that any comprehensive professional development program develops teacher quality and leads to positive changes in teacher practices and student learning (1999,1993).

Kunter illustrated that professional development is a structured process involves knowledge and skills required to improve teacher quality and student learning (et al, 1997). J.McRobbie found that there is a relation between long term teacher training and effective teaching which must be aligned with implementing activities teachers learn in their training programs towards effective school and improved student learning outcomes.

According to Berryman, the effectiveness of professional development is measured by the correlation between teacher training and students scores that can be evaluated by its accountability and the value of the content of professional development (1990).

2.3 Previous research on the effects of teacher training

2.3.1   Gain score analysis:

Many studies have examined the relationship between teacher training and student achievement through analyzing students exam score in two different points of time and assumed that there is an obvious correlation between them (Angrist and Lavy, 2001). These studies rely on observing the differences in scores and there was evidence that trained teachers tend to provide their students with advance skills that support learning and improve scores (Wayne and Youngs, 2003).

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This positive matching between teacher training and student learning quality is associated with teacher effectiveness as scores of trained teachers are positively correlated with achievement scores (Clotflter, Feng, 2005). Eberts and Stone argued that this model of data analysis provides researchers with information about in-service training though there is no control over unobserved variables (1984).

2.3.2 Studies with Random Assignment of Students

This study examines the validity of the estimated productivity of teachers and it can measure the impact of the average of teacher quality across all classrooms and schools participate in the study as Rivkin assumed in a study which includes two measures of teacher training, experience and attained degrees. This study doesn't give measures of pre-service teacher education and training (1998,2005). Different studies were conducted to measure the relation between teacher training and students score on random samples and many variables affected the results.

According to Rockoff, job experience may be correlated with the impact on student scores though it was one of the unobserved variables. It is considered as an added value to teacher effectiveness (2004)

2.4 Models of Professional Development:

Effective professional development doesn't only aim at improving the quality of the professional development programs, it can address many issues related to the goals, content, framework and materials f the training programs.

The purpose of the professional development is always the most important task that affects decision-making and highlights the framework of any training programs and the impact on student achievement and learning outcomes. In addition to providing a high quality framework to assist the professional

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development it is important to identify the purpose of the training program to choose the appropriate model. This chapter will represent a review on Five models and the correlation of training and the improvement in students results and achievement.

Joyce and Well-defined models of training as a teacher development pattern or plan than can be applied as guidance to the development program (1972).

The research includes activities, illustrations of its effect on teacher development. The research supports the importance for improving their knowledge , skills and performance desired . All these models involve teacher professional development process including the improvement of the curriculum, designing programs or school reform in general to solve particular problems.

Some specific models focus on the development of teachers' knowledge or skills through applying appropriate group training sessions. Others are based on identifying areas need improvement. There are five models of staff development that was designed according to training purposes.

1- Individually-Guided Staff Development:

Teachers acquire new skills individually through discussions and experiments. This model focuses on teaching strategies. Lawrence believed that programs with individual activities achieve their objectives more than those provide experiences (1974). Rogers claimed that self-learning influences behavior and performance (1969). This model is based on the theory of adults' best learning opportunities as Kidd and Knowles claimed that self-training increasingly improves teacher knowledge and skills (1973, 1980). According to Levine, professional development provides more practical experiences as it emphasizes individual needs (1989).

During the training sessions in this model, teachers identify their needs and topics of training they are interested in, the goals and the activities   required

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to accomplish these objectives. To guide teacher's performance and teachers exchange classroom visits are conducted in regular basis.

There are indications that the learning outcomes for professional development of this model proved strongly in the USA. It supported the objectives of the programs and changes were reported in their classroom practices and motivated students for more participation which proved that this model has an impact on students' results as it improved their attendance and discipline (Mann, 1984-85)

2- Observation/ Assessment:

This model assumes that there is a strong association between teacher development and evaluation. Wise & Darling-Hammond believe that evaluation, analysis and reflection on teacher development influence the growth of teachers' knowledge and practices (1985). As new strategies are applied, they can change teachers and students' behavior. Measurable improvements in student scores and results will also be observed.

Joyce & Showers advocated this theory which associates teacher training followed by teacher evaluation and students' learning outcomes. They also strongly determined the impact of observation/assessment on teacher practices and student learning.

3. Involvement in a Development/Improvement Process:

This model assumes that teachers are effectively engaged in the training process (Knowles, 1980). Teachers' benefit from their own experiences based demand on their demands and related to their curriculum or leads to solve problems. Trainees acquire new knowledge and skills through involvement on professional development processes individually or in groups.

Glickman (1986) believes that teacher engagement in such teacher training may enhance many effective changes and improvement in teaching, curriculum and students' results. This model starts with identifying the needs of the training then an action plan is developed followed by evaluation procedures. This training conducted individually or in larger groups provides

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feedback on the plan. Research indicates that this mode provides teachers with effective opportunities to participate in school reform. The implementation of ideal practices through the process of engaging teachers in the implementation and the evaluation of the training sessions results in improving and developing teacher's knowledge, skills, attitudes and students' results (Kyle, 1985).

4- Training:

Researchers consider training as the synonym to development; the purpose of training is to provide teachers with all desired practices to change teachers' classroom behavior and techniques. Joyce and Showers (1983) emphasized that training is a powerful process that affects and develops teachers' knowledge and skills and provides them with adequate teaching strategies.

Sparks (1983) indicates that this model enhances opportunities for discussions and peer observation as teachers exchange ideas, play active role in the training sessions and workshops, exchange practical suggestions and receive constructive feedback to accomplish the desired change positively. This training affects the quality of teaching and teachers as well, this training can also be highly effective when it is transferred to the classroom.

In a research conducted by Wade (1985) an effect size of .37 was found for the impact of teacher training on student achievement. It is determined that teacher training according to Gage (1984) is correlated to instructional practices. Though this effective influence of on teaching practices is not effective enough but there is an evidence of an improvement in student achievement, or behavior. A study of this program indicated that teachers made significant changes in their practice and students' results and scores increased dramatically. There is much more research on the effectiveness of teacher training to examine the changes in teachers practices, knowledge, skills and to identify any positive changes in student performance.

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5- Inquiry:

Teacher inquiry is an activity conducted in small groups, or school staff. It can be done in a classroom or any teacher-training center. Researchers define inquiry training as an effective opportunity for teachers to ask their questions related to classroom and provide them with answers Tikunoff and Ward's (1983). Action research conducted collaboratively in groups is one of the most effective techniques for engaging teachers in asking and finding appropriate answers to their questions through research (Watts, 1985).

Sparks and Simmons (1989) claim that this model of teacher training improves teachers' decision-making abilities. This training enhances problem solving, explores ways of collecting and analyzing data to improve their overall teaching ability and practices. Research indicates that teacher involvement in identifying classroom problems and making effective decisions to improve teaching, which has a significant impact on teacher achievement.

According to Fullan (1982), school improvement is a systematic process; he suggests that any changes in any part of the school system influences all other parts. Effective teacher development affects student achievement.

2.5 Rationale behind professional development

2.5.1 On-going training:

It is essential for teachers to have continuous and regular training that provides them with valuable opportunities to learn more and exchange ideas and experiences. Professional development keeps teachers up-to-date on mew teaching theories, technology and trends. They learn more about teaching strategies, new curriculum material and resources; it enhances collaborative learning and research skills as well. In fact, studies and research indicate the relationship between teacher training and school culture.

It is critical to examine professional development on student achievement. This part of Chapter two will focus on the rationale behind implementing professional training for teachers and the expected change or reform especially on students as a major factor related to school improvement and effectiveness

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in general. According to Weick (1976), to attempt real reform we need to change the entire system and positive impact of professional development on teacher's performance will definitely affect student achievement through out the process of development in the system in the first place.

Schools facing real challenges form implementing new teaching methods and utilizing new classroom technology to meet the international academic standards and accomplish the desired goals require well qualified teachers to enhance and establish well organized knowledge and skills.

For a very effective investment in teacher knowledge and skills researchers suggest that it is extremely important to identify teachers' weaknesses and strengths (Sawchuk, 2010). To determine whether the professional development or the training approach meets the needs of the targeted teachers more evidence and research is required.

According to the history of professional development and the early start, for example in the United States of America administrators have preferred the workshop approach, in which schools invite in an external curriculum expert on a development day to provide teachers with what's called a one-time training session on theories or subject-matter areas. Later on this type of Professional development was criticized for the lack of continuity. The most common example on this type of professional development was No Child Left Behind in 2001 as there is no evidence that teachers got more training than the one- day shot.

2.5.2 Teacher's personal growth:

Issues such as teachers' growth and the relationship with the effectiveness of professional development is one of the topics researchers investigate, Hargreaves and Fullan advocate that teacher development and educational training will meet the purposes if they acknowledge the teacher as an effective factor of school culture improvement and if teachers as individuals can adapt to enhance desired human growth (1992).

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Fullan suggests that any significant changes in teacher performance or teaching practices require changes in beliefs, styles and material to enhance personal development though out the process of educational training(2001). Furthermore, it is claimed that teacher adequate learning and training opportunities lead to the standards required to meet (1999). The value of this theory in teacher training based on identifying teachers needs and meeting them within the standards will create the change in learning of both teachers and students.

2.5.3 Knowledge Without Borders

The rationale behind training is the dramatic increase in the need of understanding and sharing most common or even new pedagogical practices and experiences among teachers of the same country or other countries as it is a valuable opportunity to engage in international standard professional development that allows effective integration of global expertise and competencies.

The most demonstrated example shared practices throughout the world by teachers are problem solving learning strategies, critical thinking, learning styles, differentiated learning and critical thinking.

There are very famous teaching strategies such cooperative learning and collaborative learning known as Kagan structures. Dr. Spencer Kagan, in 1990s, conducted a research on cooperative teaching strategies and developed over 200 classroom structures demonstrated by teachers across the world.

2.5.4 Involving teachers in decision-making:

Research clearly advocates that engaging teachers as participants in professional development is necessary to achieve a good impact. Lieberman and Miller (1986) consider teacher involvement in establishing aims and

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appropriate staff development. Is important to the success of the development and this is also supported by Ward and Tikunoff (1981).

Furthermore, according to Loucks and Pratt (1979) teacher involvement in developing curriculum can lead to the success of all efforts recommended to improve school-level decisions.

2.6 Required Information About Professional Development

Researchers need to know more about the most effective various disciplines and practices. The training models, discussed and implemented contribute to the quality of professional development required to improve students' achievement. Research determines the models effectively influence Student-Learning outcomes. Research is also needed to identify a comprehensive teacher training program to change teacher attitudes, knowledge, skills and Performance. More and Hyde (1978, 1979, 1981) analyzed the resources actually lead to teacher development goals. They claimed that it is useful to understand the effectiveness of the models and the activities. In addition, researchers strongly believe that it is better to understand those factors that enhance, support and develop classroom actual practices and they claim that this understanding remain required for well-designed professional development programs.

For better professional development, there are two major elements that affect the quality of training; delivery and commitment studies and research indicate that professional development should be aligned with the curriculum standards and continuous experience through out their work.

Professional development plays an essential role in successful education reform. Professional development functions as the connection between experience and teacher's needs to meet the challenges for students to achieve higher standards of learning.

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2.7 Effective Teacher Professional Development

Professional development is an essential process to achieve their desired goals for effective student achievement. Both teacher growth and on going professional development are the essential to the effectiveness of the educational system as a whole (Fullan & Stiegelbauer, 1991). They believe that when teachers are provided with opportunities to gain more knowledge, reflect on their practices and apply the acquired skills related to their actual classroom practices an effective professional development would be shaped to accomplish the purposes of the training (Guskey &Huberman1995).

Teachers should be collaboratively involved in professional development planning and applying their own experiences (Fullan & Hargreaves, 1991; Rosenfield & Gravois, 1996).

According to recent research investigation effective the type of teacher training affects teaching effectiveness. It is argued that the level of teacher content knowledge affects teaching. Teacher training programs emphasize subject-matter knowledge and its positive impact. Studies about teacher effectiveness place high emphasis on teacher competence in knowledge Johnson (1997).

Wenglinsky (2000,2002) advocates that teacher's knowledge is associated with student achievement as several studies indicate that teacher training on asking higher levels of thinking involves students in classroom activities. Student active involvement has a great impact on student achievement within specific subjects such as Mathematics and `science (Druva &Andsrson,1983).

Undoubtedly, teacher's experience matters in teacher effectiveness and student achievement. Professional development programs provide great opportunities to acquire new experiences and to exchange existing experiences and classroom practices.

Research supports the following characteristics of effective trained teachers:

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- Teachers become more organized and tend to show better performance (Covino & Iwanicki, 1996).

- Teachers acquire new experiences and demonstrate more depth in learning activities (Jay, 2002).

- Schools with more trained and experienced teachers tend to have higher student achievement and higher performance (Esch et al, 2005).

The appropriateness of teacher training methodologies influences student achievement. Professional development provides additional training to meet students' needs and desired skills (Kozol, 2005). Various studies support the fact that the implementation of appropriate methods provides teachers with the needed abilities to identify the demands of struggling and the gifted students as well (Van Tassel- Baska & Little, 2003)

An important characteristic of successful training programs is the teacher collaboration with other teachers (Bird, & Warren, 1985). This effective collaboration among teachers enhances teacher capacity of problem solving and more opportunities to learn from others (Clair, 1998).

Tellez & Waxman (2005) pointed that professional training of English Language Teachers affect learners of the language and there were three researches conducted in the United States of America in Arizona and California in 1991-92 to examine the effect of teacher training on students results. The three programs were successful because they were devised according to teachers' needs and offered differentiated instruction to correlate with all teachers learning styles and involves teachers actively to explore the desired knowledge and skills (Darling-Hammond, 1997).

2.7.1 How teachers change after participating in effective Professional Development

Most teachers change at least through acquiring knowledge or classroom practices and few don't experience any new skills. That was supported by the findings of a research was conducted by National

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Centre for the Study of Adult Learning and Literacy (NCSALL) in November 2003. The study investigated how teacher change after participating in one of three different modes of professional development and workshops. The study examined the factors that affect teacher change and the quality of teacher training to cause effective changes in teacher practices. Helping teachers to acquire skills and knowledge will certainly increase the opportunity for improving student achievement.

2.8 Measuring Professional Development in Impact Studies

This study seeks to examine the impact of teacher professional development on teaching practice and the improvement of student learning outcomes.

Despite belief in the impact of teacher training, however, research on the effectiveness of teacher training and the changes in student learning is very limited (Broko, 2004).

Stoll (2006) argued that students benefit from what teacher experience in the training though it takes long time to identify the desired changes based on the purpose and the implementations of professional development.

A study showed that the qualities of professional development were what mattered for correlation between changes in knowledge and skills and classroom practice. The effects of teacher learning on teacher change (Desimone, Porter, et al., 2002; Garet et al., 2001).

This study suggests the need of focusing on professional development related to the outcomes. Determining whether there is a significant correlation between the quality of professional development and its impact and the relative value of specific features of professional development (Garet, 2001).

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There are some common factors that indicate effectiveness of professional training:

1. Time: Training programs should be divided into two main phases to enhance practice and evaluation.

2. Support: Teachers need help and support to implement the knowledge, subject matter and skills presented in the training session.

3. Collaboration: To implement and share experiences and reflection on teachers' practices they need to work with other teachers and groups called communities in some professional development programs.

According to Holum & Gahala professional development should be continuous and should focus on teaching strategies that provide teacher with the effective tools of the delivery of the curriculum (2001). The professional development should address the needs of all stakeholders; parents, teachers and students. Moreover, it should be aligned with the desired learning outcomes for students (Bainbridge and Lasley 2002).

Many studies reveal the remarkable impact of schools and teachers on student achievement. Sanders and Horn, 1994 suggest that students are affected by their teachers' practices and effectiveness in teaching. It is common that effective teaching starts with effective preparation of teachers. Teacher preparation programs and professional development focus on teaching strategies to ensure that teachers acquire the desired competencies as a part of classroom practices. Teachers can support their students by strengthening their abilities and skills. (Pickering 2001)

In most countries around the world they have started research to identify the best training strategies and how to ensure the quality of teaching and quality of professional development. The most important issue to consider

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when preparing for any professional development is maintaining teachers' effectiveness; it is very critical. Educators are obliged to follow specific local or international standards. Moreover, coherent and meaningful professional development programs should be implemented within an adequate time to enhance effective practice of the content of the training sessions. Evidences on the positive effect of teacher practices on student learning strongly support the hypothesis arguing this relationship (Louden, 2005; Cambourne 2002;McInerney 2006). Researchers believe that the impact of in-service teacher professional development on student learning is considered as strong evidence on the correlation between teaching and learning. This was supported to some extent by the constructivism theory. The theory has identified effects of teacher professional development and teaching practice on learning whether the training is done as pre-service or in-service training (Cunningham, 1988, 1993).

Since the last few years researchers have shown their interest in the impact of teacher practices on student achievement. During the last 25 years researchers have investigated the effect of different reading strategies in teaching English as a second (ESL) or as a Foreign (EFL) language. Bimmel (2001), points out that the more teachers are trained the more their practices and implementation are increasing. Some studies have failed to identify the effectiveness of teacher professional development. A good example of Educational effectiveness research is studies made to investigate the effect of English teacher on "reading comprehension' scores (Fitz-Gibbon, 1992;Anderson, 1987).

Teachers affect learners and the type of student-learner relationship is a very effective factor that influences student performance and achievement Jackson (1967).

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Chapter 3. Methodology

3.1 Introduction

As it is stated in educational researches, professional development programs supply teachers with skills or knowledge to achieve better instructional practices. These practices are considered as beneficial tools for improving and changing classroom teaching and learning which eventually lead to make the desired changes in students' achievement (Fullan & Miles, 1992; Spillane, 1999).

Professional development is guidance to constructive features of the effective classroom teaching (Clotfelter, Charles, 2007)

. Professional development programs are extremely valuable in the classroom. The most important issue considered regarding professional development is its impact on students' results. In a study conducted in Dutch Primary schools, the results emphasize effect of teachers on the students' results (Luyten, 1994). The literature of this study indicated some evidence for the increase of student learning and achievement as a result to teachers' participation in teacher training programs (Bolam et al., 2005;Supovitz, 2002). The study provides also evidence on how teacher training and professional development lead to an impact on classroom practices and students' learning (Ross and Adams, 2008). To investigate the impact of teacher training program on students' results the researcher conducts a quantitative research using Quasi-experimental approach and three different tests to examine the significance change in student achievement.

Literature suggests that a quantitative research is legitimate because it helps to direct the research towards the utilization of the available data and statistical analysis to provide the study with the relevant context. The statistics provide accurate findings that can be transformed into a comprehensive package of information qualitative methods. Usually are used for the sake of generalizing the findings, casual experimental or for prediction (Goldstein 2000).

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As stated by Blumen-Pardo (2002) classroom techniques and practices have significant effects on students leaning, performance and achievement. He added that teacher education and training influence students' cognitive progress and growth. The hypothesis the study investigates is the effectiveness of teacher training and to measure the changes in students' cognitive behaviour and performance. The best evidence used to measure this efficacy is the scores of the students during the study time settings.

The professional development of teachers is one of the most critical issued studied in many research studies. The most important part of these researches was teacher training and transforming this training and knowledge into classroom practices to help in students' growth and their cognitive behavior. To achieve the objectives and needs of teachers and students specific instruments are used to prompt development and training. The research discusses the professional development as a process that enhances the usefulness of tracer education and its effect on students' assessment.

The research indicates the gap between benefits and expected improvement in teachers' practices (Ross & Burce, 2007). All stakeholders to accomplish the modifications and changes to maximize the benefit of effective training programs should study the results.

Recent studies of the impact of teacher professional development is about 4o% to 90% can be related to the quality of teacher education and training (LindaDarling- Hammondand Deborah Loewenberg, 1997).

Although the high quality of professional development is valuable but it is rarely evaluated in an effective way that's one of the major reasons that teachers are not taking training seriously and this lack of evaluation affects validity and accountability of the professional development program. The researchers intend to study the existence feedback and evaluation of the program of the study. The conclusion highlights what guidelines should be provided to boost the quality of teacher development and the evaluation required to face all challenges in teaching strategies, evaluation and students' needs.

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3.2 Problem definition and rationale

The researcher conducts this research to investigate the impact of teachers' professional development program on students' achievement and results in different time settings to measure the significant difference in the Mean and to compare between the groups included in the study. The research is conducted in a structured process of research steps. It is a quantitative research because it tends to explain the results using statistical analysis of the collected data (Miles and Huber man, 1994).

The researcher seeks measurable and observable statistics and data. The data is analyzed to interpret the findings in order to identify the differences among the variables. The researcher specifies the population and sample, the types of quantitative information collected, the instruments and tests are developed as tools for collecting data and details about the groups to conduct effective comparisons .The researcher considers what type of scores to use from their instruments. The scores are supposed to provide a detailed analysis of the responses to the questions of the research. After scoring the data and selecting the required tests to analyze the data, the researcher enters the data using a software application called   Statistical Package for the Social Science (SPSS), which is a professional program for analyzing data in very comprehensive statistics (Bryman and Cramar, 1990). This program is a powerful programme as it allows the researcher to perform a very wide range of statistics but the researcher identifies the required analysis.

The data is transferred to spreadsheet tables to interpret the results and to summarize the major findings then eventually state the major conclusion (Peers, 1996).

A Quasi experimental approach is conducted because it is one of the researches that are used when the study has existing groups in educational settings (Richard & Mark ,1998). This research is useful as it enhances the generalization of the results due to the statistical analysis using the Quasi-

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experimental approach (Achen, 1986). The main focus of the analysis will be the scores collected of the groups of students regarding the exam marks in three different periods of time before, during and at the last phase of the training session and the analysis of the types of exam questions to justify the findings and the interpretation of the results.

There are some implications as mentioned in the introduction of the research as the study focuses on a sample of students in one Educational Zone in the country and in female students' schools that more than 90% of its students are national students; UAE locals and the teachers are all female teachers. That's why the quasi-experimental approach is used to help the researcher generalize the findings at the end of the study.

In fact, research shows that creating a well trained teacher is the most important factor that improve students' achievement, so it is very important to pay attention to the type and quality of the professional development and teacher training required to achieve any desired results. The effective program puts emphasis on the training provided to teachers and how they practice and experience the skills and topics presented in the training.

Ongoing professional development provides teachers with a valuable opportunity to learn from best practices and reflect on their own teaching. The best professional development is ongoing, experimental, collaborative, and connected to and derived from working with students and understanding their needs.

The findings will help in identifying the quality of training programs required to improve both teachers' practices and students' results. The findings of the study will also indicate any evidences of the support teachers get during the training and the relation between the developed teaching strategies and techniques and evaluation tools and the quality of the questions based on higher levels of thinking moving from traditional into critical thinking and problem solving.

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The conclusion at the end of the research will state the reasons behind the findings and how to benefit from them in planning for future reform in professional development and teacher education. It will provide the researcher a comprehensive understanding of the rationale behind the drawbacks of some training and to measure the validation of the professional development program especially when it aims at improving high school cognitive skills and behaviour.

3.3 Research question

The scope of this study is to analyze how the teacher professional development and teacher training programs will impact on the students' achievement and results and to investigate whether there is a significant difference in the results before the training took place, during the training program and at the end of the training.

The focus questions of the research are:
- Is there an impact of teacher professional development on students' achievement and results?
- Has the teacher professional development on critical thinking significantly impacted student scores?

3.4 Population and sample

The population of the study composes 231 female Grade 12 students. They are distributed within three secondary schools in the United Arab Emirates in government schools in one of the Emirates (Ras Al Khaimah). The sample of the study consisted of students from three schools chosen from the schools where the teachers of Grade 12 in both streams Science and Arts, implemented the training program of the Ministry of Education. The training program was based on the infusion of critical thinking skills into curriculum for one year starting from October 2010 to May 2011 in all government and private schools adapting the government curriculum.

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A large and effective sample was chosen to support the hypothesis of the study and to provide the researcher with the professional statistics as stated by (Henry, 1990; Bernard, 2000; Cohen and Manion, 2000). This sample was selected, as the number and type of data will be effective in the quantitative research that helps to study and analyze numbers and figures to provide the researcher with a true background and reading. These readings will help to identify the phases of the study and the explanation of all results.

The sample selected in the study was trained on critical thinking strategies and problem solving such as comparison and contrast, cause and effect, synthesizing, analysis and evaluation skills. They are supposed to write academic pieces of writing, take note and write summaries. These strategies are implemented in Grade 10, Grade 11 and in Grade 12. No new curriculum was design for this purpose but the thinking skills are to be infused into the same course books. Teachers are trained on how to make relevant changes to the tasks and activities of the books to enhance better practice and implementation. It is expected to indicate evidences of improvement in the results and the score of the exams and class work marks as well.

3.5   Research Instruments

The research instruments developed to measure the difference between students' results and achievement before and after the implementation of the training program including:

(i) A table of the students' results in Grade 11, Grade 12 Term 1 and Grade 12 second Term 2 (marks in the exams).

(ii) A table of the exam specifications based on the six Bloom's Taxonomy levels of thinking.

(i)   Students' achievement and results table.

A quantitative research is conducted using students' data and scores; the scores are analyzed and interpreted in a process of a number of structured phases.

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In order to measure the improvement in students' achievement a table was developed with the marks of 231 female students in three secondary schools. The results are analyzed using Quasi-experimental research to measure the impact of the training program on the sample of the study.

The researcher has conducted different test:

a- Independent T- Test

b- ANOVA Test

c- Paired T- Test statistics

A- Independent *t*-test:

This test is used to compare results of the performance of the groups as the comparison between the two groups using the independent *t*-test into the SPSS program provides useful statistics that can be easily described. This test is used to show if there is a significant difference in the Mean. Independent *t*-test is used to determine whether means are significantly different in the three groups selected. This test will support the researcher descriptive analysis of the findings. This test is the first test conducted to find if there is difference in the mean and it will be shown in table 1 in the Findings and result analysis section in this research.

B- ANOVA Test:

ANOVA test (Analysis of Variance Test) is used to perform more than one planned comparison using the same set of data, after those specific contrasts are designed the results show that there is significant difference and this test is followed by descriptive statistics to compare the overall effect. This test is flexible and easy to use to examine the differences. The test will be shown in two tables. One will indicate the differences between the results of the students in Grade 11 and Grade 12 Term 1 and between the results in both terms of

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Grade 12. The second table will show multiple comparisons between the results between the three schools in Grade 11, Grade 12 Term 1 and finally Grade 12 Term 2. Scheffe test will be used to analyze those differences among the variables in the Mean and the standard deviation. The results will be displayed in separate table in the results analysis section.

ANOVA test is used to test the effect of pre-training program of teachers and the interactive impact of the training on the learning outcomes and students' results. The test can help in discovering the interactions between the independent variables that help to measure the amount of variation within the set of scores in the multiple comparisons conducted.

C- Paired *t*- test

The test is used to find paired sample correlations between variables to measure if there is significant decline or increase in the score, the mean or the standard deviation.

The researcher measures the effect size to examine if there is an acceptable level of consistency in the scores collected. To investigate the strength of the correlations the effect size is measured. This makes the findings are easily interpreted and reasonably explained.

The paired *t*-test is used to generalize the findings and conclusions of the study.

(ii)   A table of exam specifications based on Bloom's Taxonomy.

The researcher revised the questions and sorted all questions according to Bloom's Taxonomy to study the level of the implementation of the training program and the improvement of the types of questions of the exams. This table will be included in the conclusion section to support the findings and the outcomes of the research. The exam used for Bloom's analysis in the final Grade 12 exam. It is conducted at the end of the year and at the end of the

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training program of the teachers. It illustrates the questions, skill, the level of thinking and the weight of each questions related to the total number of the exam questions. This analysis is used to determine the changes made in the exam paper and the assessment to measure the impact of the improvement and changes in teaching strategies on the assessment and evaluation as teaching and learning is a process that includes instruction, assessment and curriculum. In this program there are changes in the curriculum, teaching strategies and changes are expected in assessment to achieve the desired reform.

D- Post Hoc test

In practice, post-hoc analyses are usually concerned with finding results and if there is relationships between the samples that would otherwise continue to be unobserved. It also strengthens. Post-hoc test strengthens the findings by limiting the probability that significant differences will seem to be noticed between the groups of the population (Keuls 1952). This test is used in the study to conduct comparisons between schools as pairs school 1 and 2 , school 1 and 3 and school 2 and 3 to find out all significant differences amongst the three schools participle in the study. It helps in identifying are undiscovered correlations and relationships between the three schools during the time settings of the professional development.

3.6 Research design

The study is an evaluation of the impact of a teacher-training program offered to secondary teachers in the United Arab Emirates schools. In this research, the researcher investigates the impact of the training program of the teachers on students' achievement and results using a Quasi-experimental approach that incorporated three different statistical tests.

The main purpose of choosing the Quasi-experimental approach is the practicability and validity of the measure and the though randomization is impossible and to minimize the threats to the external validity. The Quasi-experimental approach allows some generalizations to be made. The lack of

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randomization in this approach leads to performing comparison groups, using particular matching of results, differences and correlations.

The Quasi approach is used in this research supported by three different test; Independent *t*-test, ANOVA test and Paired *t*-test. All statistical analysis is used to identify the strengths and weaknesses of the training program in the study. All data and its analysis are used to describe the program's effect on teachers' practices and students' results. The SPSS computer analysis provides the researcher with a comprehensive package with evidences and interpretation of the scores and all relevant comparisons and correlations.

The findings are all be discussed and explained in the results analysis section and the conclusion section follows it. The researcher utilizes the findings in generalizing the results of the research and in describing the professional training program. It will help in identifying the type of support and guidance both teachers and students have got during the training sessions. It will help supervisors get a direct feedback about the effectiveness of the training program and to anticipate future problems or benefits form implementing the same program.

3.7 Training program Module

The training program module was developed in order to improve students' skills and enhance developed teaching strategies to achieve the desired results. In order to train students on the advanced thinking skills a structured timeline and handouts were prepared and handed to the targeted teachers in a series of workshops for one day per week for four hours each. Total hours of the training program were 112 hours and this program started in October 2010 and finished in May 2011. The exams and types of questions were designed as assessment tools for summative and formative exams based on the training frame and dimensions.

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Teachers are divided into three groups according to the grades they are teaching. They are provided with training handouts with tasks and activities to be implemented during the workshops to enhance hands on the activities the program intends to infuse into the curriculum.

They use the current books to study and use in the program and identify the quality of the desired changes and the levels of critical thinking to be practiced at classrooms as the final exams are unified on the Zone level. The Zone is the Educational department of each Emirate. The training program is conducted in seven educational Zones by the same trainers of the same organization. It is expected to have more classroom observations and meetings to follow up the implementation of the training and to discuss all related issues to get direct feedback from the teachers and their supervisors. The feedback should be sent to the Ministry of education to identify the next step for improving the curriculum and the exams.

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Chapter 4: Data Analysis

The purpose of this chapter is to report the findings of this research and to include all gathered data analyzed and structured using series of tests in order to determine statistical significance for possible differences in the scores among the three schools.

This chapter examines the data collected in the study about the impact of teacher professional and training on students' results and achievement at the end of a teacher-training program for 8 uninterrupted months in all secondary schools in the Government Sector. The research answers two research questions and studies the impact of teachers' training on students' achievement as a hypothesis. The results and scores collected for the study are scores of 231 female high school students in Grade 12 in English as one of the core subjects. The scores are collected in three different time settings and periods. As mentioned in Chapter 3 a Quasi-experimental approach is conducted to find answers to the research questions using different tests:

- Independent t - test
- Paired t-test
- One Way ANOVA Test
- Scheffe Post-Hoc test

4.1 Scores Analysis

This section is devised to answer the two research questions:

Research Questions:

Question One: Is there an impact of teacher professional program and training on students' achievement and scores?

Question Two: Is there a significant difference in the scores that indicates the hypothesized positive impact of the training program?

Hypothesis: Educators rely on teacher training to improve students' performance.

Research has identified teacher professional development and training as one of the important factors to improving learning and students

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performance and their results eventually (Borko & Putnam, 1995). According to Gary Sykes teacher professional development and training lead to the desired reform and improvement in their classroom practices that are extended to students' performance and scores (Sykes, 1996).

School	Track	G11	G12_T1	G12_T2
School1	Art section	65	65	65
	Science section	35	35	35
	Total	100	100	100
School2	Art section	82	82	82
	Science	19	19	19
	Total	101	101	101
School3	Science	30	30	30
	Total	30	30	30
Total	Art	147	147	147
	Science	84	84	84
	Total	231	231	231

Table 4.1: Number of Students

4.1.1 Overall Analysis

Table 4.1 shows the number of students involved as participant in the sample of the study from three schools with total 231 female students in Grade 12 from three government high schools; 147 from the Art section and 84 from the Science section.

Table 4.2 illustrates the scores of 231 students in three time settings in three female high schools. There is a difference identified in the Mean in general but to examine that difference and to show if it is a significant difference in statistical analysis are implemented to compare the scores in the three schools involved in the study and to compare the results of the each school throughout the three time settings.

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It is noticed form Table 4.1 that there is a difference between students results in Grade 11 prior to the implementation of the teacher training program and the results of students in Grade 12 Term 1 after 4 months of teacher training and at the end of Term 1 exams. This difference is determined in all schools. Tables 4.3 and 4.4 provide clearer illustration of the differences identified in the scores.

4.1.2 Independent *t*-Test

Table. 4.2 shows the difference in Means in Grade 11 exam, the year prior to the training program in 2008/2009, in all schools and results in Grade 12 in both Terms after 4 months of the training then at the end of the academic year 2009/2010. Referring to Group comparisons in the three schools, students' scores in Grade 11 results as an overall average were higher than their scores in Grade 12. For example, in Grade 11 Art section (1) the Mean was 75.43 while it became 69.65 in Grade 12 Term.1 and 69.83 at End of Term 2 Exams. This comparison implies that there is a difference. Moreover, as mentioned previously statistical analysis is required to investigate the significance of the identified difference in Means. Table 4.2 provides a comparison between Means and Standard Deviation (SD) in each school comparing the two sections, Art and Science as two main student streams, the difference does exist but needs more analysis to identify its significance.

	Track	N	Mean	Std. Deviation
Grade 11	1	83	75.43	12.215
	2	147	66.41	12.163
Grade12 Term1	1	83	69.65	15.746
	2	147	62.03	15.647
Grade12 Term 2	1	83	69.83	15.574
	2	147	58.47	17.011

Table 4.2 Comparison between Mean and Standard Deviation

	Levene's Test for Equality of Variances		t-test for Equality of Means

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		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
G11	Equal variances assumed	.160	.690	5.396	228	.000	9.026
	Equal variances not assumed			5.390	169.654	.000	9.026
G12_T1	Equal variances assumed	.018	.893	3.537	228	.000	7.617
	Equal variances not assumed			3.531	169.363	.001	7.617
G12_T2	Equal variances assumed	2.532	.113	5.013	228	.000	11.362
	Equal variances not assumed			5.138	183.037	.000	11.362

Table 4.3 Independent Samples *t*-test

The calculation and statistics carried out in Table 4.3 measure Means difference of the sample. This figure shows that the mean difference of Grade 11 scores for all schools was 9.026, 7.617 in Grade12 Term 1 and 11.362 in Grade 12 Term 2 and the 95% confidence interval for the estimated population mean difference is between 5.73 and 12.321 in Grade 11, in Grade 12 Term I it was between 5.720 and 12.33 and in Grade 12 Term two it was between 3.37 and 11.859.

Interestingly, as a result of the Independent t-Test and the comparison of the Means between all schools there is a common element found between those scores across the three schools participated in the study and that shows the difference and chart 4.4 provides a clear indication to the differences.

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Chart 4.3 Means Variance

G12_T2: 2 = 58.47, 1 = 69.83
G12_T1: 2 = 62.03, 1 = 69.65
G11: 2 = 66.41, 1 = 75.43
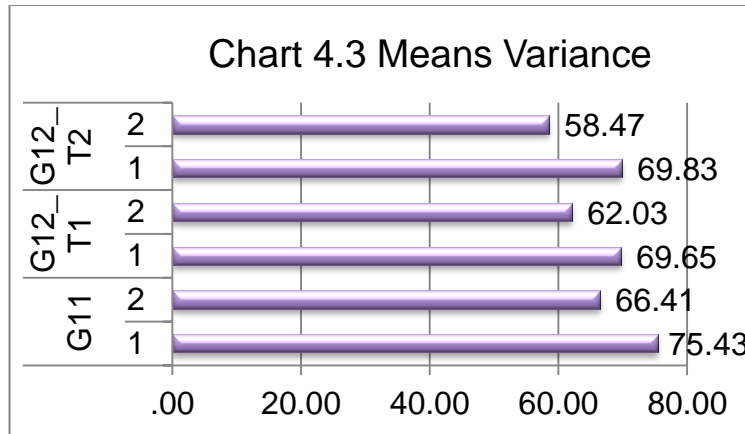
4.1.3 One Way ANOVA Test:

An ANOVA Test was performed to determine if the research data might have indicated any differences in scores among the three schools. Table 4.4 illustrates the relationship between schools' scores throughout the three different time settings. The results were analyzed using one-way ANOVA, between group designs. The findings of this analysis revealed that in Grade 11 there was a significant difference and in identified a differences in Grade 12 Term 1 scores. The analysis didn't show any significant difference in the Means in Grade 12 Term 2. According to Table 4.4, the ANOVA summary of the relationship between the three groups confirmed that that there is not a statistical significant difference in Mean which is greater than 0.05.

		Sum of Squares	df	Mean Square	F	Sig.
G11	Between Groups	2704.285	2	1352.143	8.658	.000
	Within Groups	35450.937	227	156.172		
	Total	38155.222	229			
G12_T1	Between Groups	5955.234	2	2977.617	12.705	.000
	Within Groups	53199.896	227	234.361		
	Total	59155.130	229			
G12_T2	Between Groups	1632.774	2	816.387	2.751	.066
	Within Groups	67355.613	227	296.721		
	Total	68988.387	229			

Table 4.4   ANOVA Test

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To identify which pairs of groups significantly differed; comparisons are conducted between the three schools.

Multiple – comparison correlation tests were conducted to interpret the difference.

4.1.4 Scheffe Post – Hoc test:

Table 4.5 using the Post-Hoc Test a series of multi-comparisons can be created to indicate the differences among the three schools 1,2 1nd 3.
 The Post Hoc Test revealed that no significant differences were noticed between School1 and school 2 or in School 1 and school 3 in Grade 11 scores as shown in Table 4.6.

Dependent Variable	(I) School	(J) School	Mean Difference (I-J)	Std. Error	Sig.
G11	1	2	6.814	1.767	.001
		3	7.273	2.604	.022
	2	1	-6.814	1.767	.001
		3	.459	2.598	.985
	3	1	-7.273	2.604	.022
		2	-.459	2.598	.985
G12_T1	1	2	9.228	2.165	.000
		3	12.728	3.191	.000
	2	1	-9.228	2.165	.000
		3	3.501	3.183	.547
	3	1	-12.728	3.191	.000
		2	-3.501	3.183	.547

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G12_T2	1	2	5.507	2.436	.080
		3	4.893	3.590	.397
	2	1	-5.507	2.436	.080
		3	-.615	3.582	.985
	3	1	-4.893	3.590	.397
		2	.615	3.582	.985

Table 4.5: Post-Hoc Test

School	N	Subset for alpha = 0.05	
		1	2
3	30	66.33	
2	101	66.79	
1	99		73.61
Sig.		.981	1.000

Table 4.6 Grade 11- Scheffe

Further comparison among the scores of the students in the three schools was carried out in Grade 12 Term 1 (see Table 4.7 Grade 12 Term 1). The table shows that there was a difference in Grade 12 Term 1 between schools 2 and 3 but the difference was less than it was in Grade 11. Looking at school 1 and 2 in Grade 12 Term 1 it is evident that the difference was more.

School	N	Subset for alpha = 0.05	
		1	2
3	30	57.77	
2	101	61.27	
1	99		70.49
Sig.		.481	1.000

Table 4.7: Grade12_T1

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A final comparison has been conducted among the three schools to test the significance in difference of means in their scores (see Table 4.8 Grade 12_T2).

The analysis implies that there were no significant differences in Grade 12 Term 2 among schools 1,2 and 3

School	N	Subset for alpha = 0.05
		1
2	101	60.12
3	30	60.73
1	99	65.63
Sig.		.240

Table 4.8:Grade 12_T2

Scores and comparisons conducted using Scheffe Post-Hoc Test in Table 4.5 above revealed School 1 Mean was remarkably higher than the other two schools and in Grade 12 Terms 1 and 2 it showed a difference with higher Mean than the other groups as well

4.1.5 Paired *t* - Test:

It is a correlated t-test employed to investigate any significant improvement in the scores among the three schools. Table 4.9 shows that comparing students' scores in Grade 11 in the three schools to their scores in Grade 12 Term 1 there was a decline in the average. And comparing the scores in Grade 12 Term 1 to Grade 12 Term 2 scores an increase in Standard Deviation was noticed.

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	G11 - G12_T1	4.879	11.467	.754	3.392	6.365	6.467	230	.000

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| Pair 2 | G12_T1 G12_T2 | 2.221 | 13.031 | .857 | .532 | 3.910 | 2.590 | 230 | .010 |

Table 4.9: Paired Samples Test

The effect size was measured. Coefficient of determination was around 50%, which means that the test has acceptable level of consistency as shown in Table 4.10.

		N	Correlation	Sig.
Pair 1	G11 & G12_T1	231	.708	.000
Pair 2	G12_T1 & G12_T2	231	.699	.000

Table 4.10: Test of Consistency of marks

To sum up the data analysis:

Employing and analyzing the results of all above and previously mentioned tests and to conclude this section, there are differences between students' scores in Grade 11 and Grade 12 Term 1 and Term 2. There were no significant differences among the three schools in Grade 12 Term 2. School 1 Mean was remarkably higher than the other two schools in Grade 11 but in Grade 12 it was almost the same and there was no significant difference noticed. A decline in the average was noticed in scores in Grade 11 and Grade 12 Term 1 comparison and an increase in Standard Deviation when compare grade 12 Term1 scores to Grade 12 Term 2 scores (see Table 4.11).

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	G11	69.75	231	12.949	.852
	G12_T1	64.87	231	16.098	1.059
Pair 2	G12_T1	64.87	231	16.098	1.059
	G12_T2	62.65	231	17.366	1.143

Table 4.11: Paired Samples Statistics

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The hypotheses suggests positive impact of teachers' training and professional development on students' learning and achievement but referring to the results of the data collected and analyzed in this research the training program has a negative effect on the scores which lead to the increase in the Standard Deviation and the remarkable decline in the average. The researcher examined the exam paper and the types of questions. The training program provides teachers with teaching techniques and strategies to infuse Critical-thinking strategies into the curriculum whereas the exam focused on testing students' knowledge for about 80% of the questions covered the first two levels of thinking according to Bloom's Taxonomy Benjamin Bloom (1956). This will be discussed in details in chapter 5.

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Chapter 5: Discussion and Conclusion

5.1 Overview:

This research investigates the impact of teachers' training on students' achievement. The hypothesis of the study was that there is an expected effect of teachers' professional training on their students' performance and results based on the desired changes and improvement of their classroom practices as a result of the training sessions attended. This hypothesis suggests a consistent relation between teacher training and students achievement (Borko, 2004; Loucks-Horsley & Matsumoto, 1999; Supovitz, 2001). National Research Council conducted a research in 2004 to examine the effectiveness of teachers' training and its effect on students' achievement supporting their hypothesis with evidences. Most researchers stated that to achieve the desired impact of teacher professional development, the program should be strongly planned, designed and implemented (Garet et al., 2001).

To determine any changes or differences in the scores of the students across the three schools participated in the study a series of tests were conducted. This chapter will discuss the

findings; identify the implications of the study and the recommendations suggested for better practices in the future. A conclusion will be provided as an interpretation of the quality of the training programs and all possible suggestion to maintain a good quality of teachers in the future or to provide them with more comprehensive training seeking a structured reform for better future and better education.

5.2 Findings and discussion:

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This section focuses on the findings of scores analysis and interpretation of the statistical study. The discussion section highlights the major findings and the relationship between the scores across the three schools and the actual implementation of the training program. The employed tests answered the first and the second questions of the research though the answers indicted a negative correlation between the training program and its impact on students' achievement.

First, there was a difference between students' scores in Grade 11 the year prior to the implantation of the training program and the two time settings in Grade 12 Term 1 and Grade 12 Term 2 during and after the training program. The differences diminished dramatically in the third exam in Grade 12 Term2.

Moreover, the average declined remarkably and the Standard Deviation increased. This was applied to the three schools. School 1 Mean was higher than the other two schools but at the end of the training program it was almost the same as the other two groups.

The analyzed scores indicated that there was a negative impact of teacher training on students' results.

The findings determined a comparable reaction to the training program in all schools which was implemented in all schools using the same training and teaching material and assessment tools at the end of each phase of the two phases of the professional development which contradicting with the hypothesis and most of the researches claim that teachers' training changes teaching and instruction practices that lead to improvement in students' performance. The research showed no effectiveness of teachers' education and training on students' performance received while teaching. Similar studies were conducted by Florida Department of Education's K-20 Education Data Warehouse in 2006 to examine the effect of various types of teacher professional development programs on students' achievement. In that study they studied many other factors such as teacher's experience, pre school training and the quality of training programs. This program implemented in all government high schools aimed at changing the traditional method of teaching and enhancing more thinking skills and techniques using the same curriculum. Teachers were trained to develop their own activities and assessment tools based on the

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training sessions and Handout provided to all. It is obvious that daily worksheets students used have been modified and many graphic organizers were used to stimulate thinking and expose students to different types of critical thinking tools. The unified Exams and assessment tools at the end of each Term during the year of the training introduced less than 20% of thinking skills as more than 80% of the questions were testing general knowledge and comprehension the lower levels of thinking according to Bloom's taxonomy. They built their training on infusing the six levels and to increase the percentage of higher-level thinking (see Figure 5.1 Bloom's Levels of thinking).

Figure 5.1: Bloom's levels of thinking
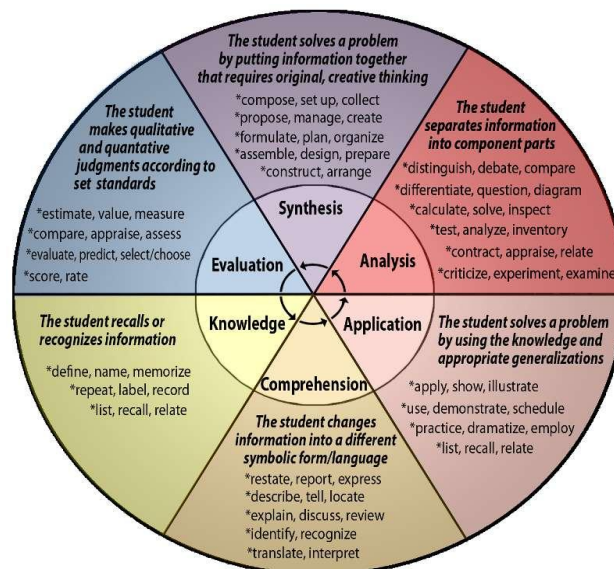
The 231 students participated in the research were from three high schools in three different areas of the Emirate but teachers practices were the still the same. Figure 5.2 illustrates the process of the training program starting from October 2010 to May 2011.

It started with providing teachers the required knowledge about critical thinking skills in English language teaching and learning during workshops three days a week for all government high schools and that was to arouse teachers awareness of   the importance of reinforcing thinking skills and followed by implementation phases where teachers were supposed to use these skills in daily worksheets, on going assessment quizzes and Exams. The program was

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conducted by an educational organization not by the Ministry of Education to

Skill	Number of Question	Level of thinking	%

provide teachers with training on thinking skills but using the current curriculum as mentioned previously.
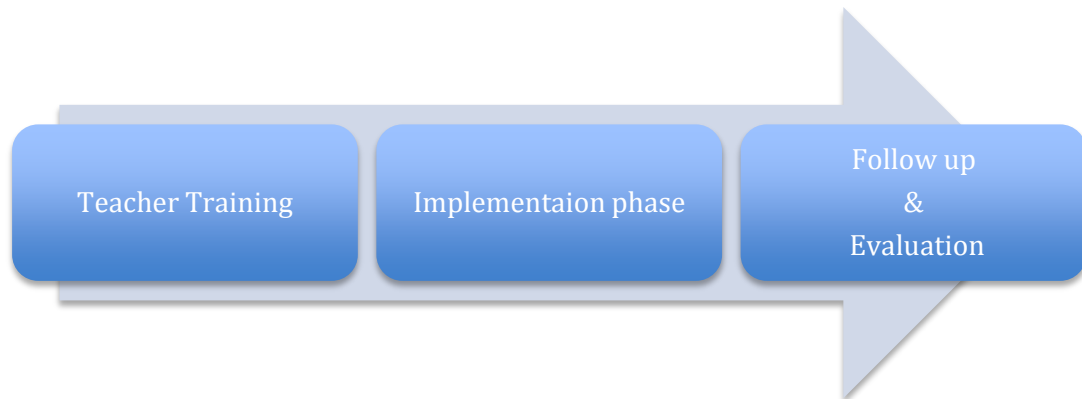

Figure 2: The training Process

The last phase of the training was missing for one major reason. The exams were unified and designed by Supervisors of English in the Ministry of Education not by the trained teachers. In an analysis of the types of questions included in the final exam in Grade 12 TERM 2 about 80% of the questions were assessing the first two levels of thinking; knowledge and comprehension levels. The writing was controlled and guided, students were provided with the types of sentence structures to use, the ideas and the words to include in their writing. Table 5.3 shows the distribution of questions and the levels of thinking covered in the end of Term 2 exam. During the training session and in the training material provided to teachers, teachers were trained on using Venn diagram, cause and effect, problem solving strategies, classifications and evaluation.

Table 5.3:Classification of Exam questions according to levels of thinking

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Reading	1, 3,4,6	Knowledge	40%
	2,5,7,8,9	Comprehension	50%
	10	Evaluation	10%
Language	1,2,3,4,5,6,8,9,11,12,13,14	Knowledge, Application	80%
	7,10,15	Synthesis	20%
Writing	1,2	Knowledge & Application	100%
		Higher levels	0%

It is stated in many studies that teacher training can provide effective instruction make desired changes in students' behavior and performance (Watson & Robinson, 1996).

To achieve the changes and improvement in students' achievement there should be a consistent process starting from planning, implementation, follow up and evaluation then feedback to maintain having control over the quality of material delivery, instruction and assessment (Doyle, 1985).

Students' score could be affected by many factors such as the quality of implementation, the professional development program itself, the lack of follow up and evaluation and the fact that there is no alignment between curriculum and final assessment and End of Term exams.

As mentioned in this chapter, there is a sharp drop in the scores prior to the training and students' score at the end of the training period. The researcher believes that the lack of coordination and alignment between all parties responsible for curriculum delivery and assessment could be one of the factors that affected students' performance.

The researcher didn't observe any positive effect though the ultimate goal of the training was to improve students' thinking abilities. Students' achievement has been negatively affected due to various reasons that should be examined in the future such as the implementation, teachers awareness of the importance of improving thinking skills, the curriculum which should be modified to be aligned with the desired learning outcomes and the missing coordination with the assessment unit. The researcher also believes that immediate feedback is

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required during and after each phase of the implementation of the training sessions.

In summary, there is a solid integration between teaching and learning which was missing in this training program. Most of the previous research stated the relationship between teachers training and its positive impact on students' results. The researcher believes that more research and investigation are required to improve the quality of teacher training as this program was in-service training program.

5.3 Implications:

This study as mentioned previously examined the impact of teacher training on students' achievement in government high schools. The findings revealed a negative impact of teacher training on students' results across the three schools participated in the study and all statistical analysis in Chapter 4 indicated this impact.

There are implications to all factors affect the research. All these implications should be examined and taken into consideration in future research.

The negative impact on students' achievement denotes the following:

- Teachers didn't implement the training program skills and knowledge effectively.
- Some teachers neglected implementing the strategies they were trained to use due to the lack of teacher awareness of the importance of the program.
- The researcher investigated the impact of the training sessions in female schools only and didn't include male schools to gather wider data about the implementation of the program. A previous study about the effect of participants on the results of the study suggests that participants involved in the study are considered as one of the variables of the experiment (Shaver, 2005). The lack of cooperation between male and female schools widened the gap between the quality of teaching and the delivery of the content of the professional development while the teacher

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wrote the final exam neglected the main part of the training program, which was building critical thinking skills.

- School administrations and specially principals of the assigned schools for the program didn't follow up and assess teacher performance properly.

- The researcher used the quasi-experimental approach that provides statistical analysis focusing on the analysis of the results but still there is a great demand on investigating the quality of professional development provided to teachers (Trent, & Crandell, 2001).

- Teachers implemented the program using the current curriculum and were asked to modify it, not all teachers have the skill and knowledge of curriculum design. To maintain the standards of the learning outcomes the curriculum unit in the ministry of education and the training program representatives should be involve in the process.

- The assessment unit provided teachers with the exams but there was no alignment with the curriculum with its latest modifications and added skills of thinking. Trained teachers should be involved in exam writing.

- More than one tool can be used to collect data such as questionnaires for teachers, surveys for students or interviews for teachers and supervisors to identify the problems teachers, students and supervisors might have faced while implementing the training program.

To sum up, there are many factors affected the implementation and the effectiveness of the training program:

- Lack of teacher education and awareness of thinking skills teaching, strategies and assessment.

- Lack of alignment between assessment unit, curriculum unit and teachers who are responsible for the delivery of the content of the program.

- Lack of coordination between school administration and teachers. School Principals conduct classroom observations but they don't follow

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up and assess the implementation of the program, as they don't have any information about its content.

- Lack of continuous research such as action research that helps researchers identify the problems and find solutions to them.
- Lack of constructive and timely feedback. Teachers always need support when implementing a new program.
- Lack of teacher resources and material in schools.

5.4 Conclusion:

To conclude, the impact of teacher training was negative on students' achievement. The statistical analysis using the Quasi experimental approach and the series of tests used revealed that there were no positive changes in students' performance and score. The findings imply that there are many factors affected students' achievement. These factors could be, as mentioned in the implication section, related to the quality of the professional development, teachers' awareness, the curriculum design, the type of assessment and the lack of alignment among all factors responsible for achieving the learning outcomes of the training session. It is difficult to measure all these factors and control them to maintain the delivery of the content of the training program and to achieve the desired positive impact of teacher training on students' achievement.

The researcher believes that the implementation of the program has the greatest effect on the findings of the research. This program should be implemented in all schools in both sectors as thinking skills are required in all grades. Training all teachers in all grades from k-12 will provide students with practice and understanding of these skills. Another important factor that might help teachers is changing the curriculum and infuse all thinking skills in a very organized units starting from the early grades. This type of professional programs should be followed up as the assessment should be aligned with the quality of the content provided to students as mentioned previously.

The researcher believes that future research could include male schools, as it was one of the limitations of this study. Examining both genders' responses and

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achievement will provide a full picture of the situation and will limit the variables of the study as well. In general, it is challenging to measure the effectiveness of teacher professional development because of the factors that affect the implementation and the assessment of teacher performance. Students' scores could be measured using the exam marks but the question educators are trying to answer long time ago and are examining is: to what extent can we measure the quality of teacher professional development and its effectiveness? Recent research indicates the importance of improving teaching, methodology, measures and frameworks used to assess the effectiveness of teacher professional development and its impact on students' achievement.

5.5 Recommendations:

While there are limitations to this study professional development is considered one of the most important factor that affect both teaching and learning. This study might help the decision makers to consider how to provide teachers with effective training to enhance more opportunities for teacher training, sharing and education including teachers' motivation and desired learning outcomes.

As a result of the findings and the analysis conducted in this research, the researcher suggests some recommendations to improve the impact of teacher training on students' achievement and to teacher future practices and awareness.

All stakeholders have concerns about the quality of teaching and learning outcomes that's the major rationale behind looking for evidences to assess professional development programs, implementation and their impact on students' achievement.

1. Analyze students' needs using different tools to gather required data such as questionnaires, exam results, interviews and observations.
2. Provide teachers will all relevant knowledge, skills and material needed for implementing the training program.

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3. Involve teachers in designing the assessment tools to avoid the lack of alignment and coordination between teachers and the assessment unit.

4. Providing teachers with regular and responsive feedback about their classroom practices after classroom observations or through examining samples of students' work and homework assignment (Patton, 1997).

5. Provide teachers with sufficient   consultation support.

6. Arouse students interest and awareness on the thinking skills and implementing them in their daily basis not only on certain occasions and exposing students to different types and levels of thinking.

7. Assigning on going practice teams or buddy system to help teacher exchange experience and ideas for effective teaching and classroom practices.

8. The training program should be introduced to all teachers in all subjects not only English language classes, this will provide students with horizontal practice within the same grade but in all subjects.

9. To ensure the quality of implementation a Question Bank or Worksheets' Bank should be devised to support teachers with supplementary material with the same quality and to ensure that all classes are practicing the same skills.

10. On going research should be conducted on different times of the year by both Curriculum and Assessment Units to study the improvement achieved and the impact of teacher training on students feedback.

11. Starting the infusion of thinking skills into curriculum from the early grades not only from the high school stage.

12. Program evaluation should be aligned with the professional development program's goals and objectives.

13. It would be very helpful to provide teachers with explanations of the content and desired outcomes.

14. Highlight initiatives, innovations and creativity to motivate teachers and students as well to arouse immediate implementation of training program.

15. Assessment should be aligned with the curriculum delivered implementing the new thinking skills. The assessment unit should be provided with samples of questions as suggested question Bank to

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ensure the quality of questions and to avoid the separation between practices and evaluation.

16. Technology should be utilized in such programs for many reasons such as:

- Arousing students' interest.
- Providing teachers with resources using the Internet.
- Online practices.
- Providing a variety of applications for presentation and practice as well.

17. To assess the effectiveness of teacher professional development and its impact on students' achievement there should be a common framework as indicated by (Pittman, 2008).

18. Provide external presenters of teacher professional development programs with the curriculum document to be familiar with the content, learning outcomes and the Key Performance Indicators. This allows more understanding of the goals of the curriculum and to align with the goals of the training programs. This can help in identifying the changes required in the curriculum and assessment as well.

19. Establish a supportive atmosphere by both administrations and supervision, as teachers need to feel secure. Teachers should keep in touch with both the presenters of the professional development and their supervisors.

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Institute of Education, The British University in Dubai
MEd: International Leadership and Policy in Education – Dissertation
Student ID: 90051

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Appendix 1

An Excel sheet with students Grades

School	Student	Grade 11	Grade 12

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Student ID: 90051

			1st Term	2nd Term
	1	90	86	82
	2	76	78	68
	3	89	88	89
	4	92	78	83
	5	75	78	69

Appendix 2

A- Sample of Government Grade 12 Exam

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II. Writing (40 marks)

A. 1. Sentence Writing (15 marks)

- **Write 5 sentences (2 simple and 3 compound/complex) about the picture below. (3 marks each)**

1. (Simple Sentence)

_____

2. (Simple Sentence)

_____

3. (Compound/Complex Sentence)

_____

_____

4. (Compound/Complex Sentence)

_____

_____

5. (Compound/Complex Sentence)

_____

_____

B- Sample of Writing questions

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A.2. Essay Writing   (25 marks)

Write an argumentative <u>essay</u> of about 200 words on the following topic:

It is believed that the internet is the best means of communication.

Discuss the above statement and state your opinion.

These ideas may help you.

For	Against
- fast means	- waste of time
- easy to use	- no social life
- affordable to all	- affects your family life
- fun to use	- affects your culture
- helpful in need	- unhealthy/obesity

_____

_____

_____