Teaching and Learning Thinking Skills in the Kingdom of Saudi Arabia: Case studies from seven primary schools

Submitted by

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I certify that all material in this thesis which is not my own work has been identified and that no material has previously been submitted and approved for the award of a degree by this or any other University.

Signature .................................................................
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In the Name of Allah, the Most Gracious, the Most Merciful

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Abstract

In recent years, teaching and learning thinking skills in primary schools through adoption of the infusion approach to thinking skills in school textbooks has increasingly become a focus of policy development in the Kingdom of Saudi Arabia (KSA). This study endeavoured to understand teachers’ and students’ experiences of teaching and learning thinking skills in primary schools. It aimed to explore teachers’ and students’ perspectives on, and current approaches to, the teaching and learning of thinking skills in the KSA primary curriculum; to investigate the impact of the factors which appear to guide teachers’ and students’ experiences of thinking skills in the classroom; and to identify possible challenges that face both teachers and students in developing these skills.

The study was undertaken within the interpretive paradigm. It adopts a socio-cultural perspective in its exploration of teachers’ and students’ experiences of teaching and learning thinking skills. Case study was employed as methodical way to yield in-depth detailed data to provide an understanding of the issues in the study. Three instruments of data collection provided insight: semi-structured interviews, classroom observation and group discussions. These presented a rich variety of data on topics regarding teaching and learning thinking skills, permitting triangulation to develop robust findings. The sample consisted of seven case study classes of male students from the upper years in primary schools in the KSA.

Several findings emerged from the data by using grounded theory analysis techniques, regarding the factors and challenges that influence teaching and learning thinking skills. Four significant outcomes are highlighted. The first is that teachers embracing the infusion approach to thinking skills as a natural part of the subject matter in textbooks was one of the most pervasive practices. Secondly, the study has highlighted the importance of the actual dynamics of interactions in classroom contexts via teachers’ and students’ complementary roles. Thirdly, spiritual/cultural inner motivation greatly influenced and shaped teachers’ and students’ practices of teaching and learning thinking skills. Fourthly, the study has shown the crucial importance of teachers’ and students’ identities in their performance of thinking skills. These four elements work together in a dynamic relationship in the particular socio-cultural context.
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Abbreviations and Terms

**CAS**: The continuous assessment system

**CASE**: Cognitive Acceleration through Science Education

**CPD**: Continuing professional development

**GT**: Grounded theory

**KSA**: The Kingdom of Saudi Arabia

**MOE**: Ministry of Education

**MOHE**: Ministry of Higher Education

**P4C**: Philosophy for Children

**ZPD**: The zone of proximal development
Chapter One

Introduction to the study
1.1 Introduction

This chapter explains the reasons why the study was undertaken and explains its aims, research questions and significance. It also presents an overall view of the history, society and education of the Kingdom of Saudi Arabia (KSA) in order to provide a contextual framework. It goes on to consider the current situation regarding thinking skills within education in the KSA. The chapter concludes with an outline of the thesis organisation.

1.2 Rationale for the study

Research suggests that a number of advantages will accrue when thinking skills become a main part of a community, including independence of thought and meaningful, deep learning in schools. Such research has argued that this will occur by encouraging the language of thinking, constructive interactions within classrooms, and the transfer of the knowledge, skills, values and strategies to learners’ everyday lives. Confirmation of this was affirmed by Cotton (1991), who argued that several studies had demonstrated that enhancing thinking skills led to acceleration of learning gains within subject domains. Therefore, one of the general aims of teaching thinking skills is that students will be equipped with the skills to ‘think for themselves, to be self-initiating, self-modifying and self-directing’; they will need to be able to ‘learn and change consciously, continuously and quickly’ (Costa, 2006: 62).

There is much evidence from empirical studies (e.g. Marzano, 1998; Wegerif, 2000; Trickey and Topping, 2004; Burke and Williams, 2008), in many countries across the world, that has confirmed the impact of programmes which develop learners’ ability to identify coherent alternatives, evidence and reasons for beliefs in an educational context. Empirical research has provided persuasive evidence that both academic achievement and students’ quality of thinking can be improved during thinking skills programmes to achieve the above skills across classroom contexts (Cotton, 1991; Beyer, 2008b).

Numerous studies have recommended further research on thinking programmes within education, and on models to ensure effectiveness in the development of thinking skills across the curriculum and to explore the opportunities for the development of thinking skills within it, such as Al-bakr (2004), Jeffrey and Craft (2004), Rodrigues (2005), Alkhadra (2005) and Taggart et al, (2005). In this connection, in 2003 the Third Arab Conference of Education
for the Gifted was held in Amman, and its main recommendations concerned issues of 'Teaching for Thinking', which were seen to be a key factor in the development of teaching and learning in the Arab world.

The current study worked from the premise that teaching and learning to think, and developing students’ ability to face complex and difficult challenges in their social context, are among the most significant aims of formal education globally. Educational systems, therefore, should support and develop learners’ thinking skills and the motivation of students to use such skills. This should start in the classroom by the creation of an optimum classroom atmosphere, leading to the successful dynamic teaching and learning of thinking skills.

This topic interests me because I became aware of the importance of thinking skills and their impact on the individual through my work as a lecturer in ‘Personal learning and thinking skills’ at the University of Al-Qassim, and also as a teacher in schools in general education, and before that as a student. This experience helped me to notice the existence of typical features of traditional pedagogy in a wide range of schools, such as ‘memorization’ and ‘reception in silence’ in the old traditional methods of teaching. Also, I observed that some students complained about questions with higher levels of mental functioning, such as analysis, synthesis and evaluation. The reason for this opposition may be that students have the habit of learning in a way that requires conservation, memory and retrieval of information. Confirmation of this was noted in a study by Alkhadra (1994) who found that most types of questions used by teachers at the primary stage were recall questions. These constituted 94% of the total questions while only 5% of the questions concerned understanding, and questions of application, analysis, synthesis and evaluation were non-existent. In addition, I noted teachers lacked confidence when teaching thinking skills through the textbook exercises. Conversely, I have, prior to undertaking this social study, observed the early benefits of the introduction of the infusion approach to thinking skills in the new curriculum. This has been made manifest through a variety of features, such as emphasis on clear teaching and learning of thinking skills through the curriculum itself; and the debate that this introduction prompted among intellectuals, experts, parents and local media about the benefits of the application of thinking skills in the new KSA curriculum.

 Altogether, the recommendations of research studies, my own observations and my sense of responsibility for developing the pedagogic skills of teachers as a lecturer at the University, combined in leading to my belief in the significance of developing learners’ thinking skills. On a wider scale, the international trend of globalization and the information revolution have necessitated a review of how we deal with the acquisition of knowledge. The student is now open to a
A wide range of social messages and needs to learn to distinguish between those social values which should be adopted and those which should be rejected. The demands of development in a context of international competition point to the need for an urgent review of education policy which will harmonize the output of the education system and the requirements of development. All these reasons contribute to the need to carry out a study on teaching and learning thinking skills in primary education in the KSA. It is hoped to make an important contribution to the literature of thinking skills in the KSA education system.

Despite the KSA Ministry of Education’s (MOE) proposal to apply thinking skills across all education stages, as will be mentioned later in this chapter at Section 1.5.4, there is a lack of research on this subject, particularly relating to its socio-cultural context. This was despite searching the research database the major universities in the KSA which specialise in education, as well as the major KSA research centres such King Faisal Center for Research and Islamic Studies and King Fahad National Library, as well as the British Library, not to mention the Internet. This lack of research on this subject only increased my interest and determination to pursue this study in order to fill those gaps.

1.3 Aims of the study and its associated questions

In light of the aforementioned review, I argue that there are gaps in the area of teaching and learning thinking skills in the KSA primary education context which need to be explored. Examples of such gaps are the factors influencing the ways in which thinking skills are taught and learned; the obstacles facing this teaching and learning in the classroom. I further argue that filling these gaps will lead to improved teaching and learning of thinking skills in the classroom in the KSA primary education context. Therefore, the main aim of this study is to explore some of these gaps, whether regarding reforming the thinking skills curriculum in most school textbooks; hearing the reflections of in-service teachers on their experiences of applying thinking skills; exploring the factors which could influence the ways in which thinking skills are taught; and discovering challenges to the implementation of teaching and learning thinking skills in primary classrooms. This study is thus undertaken in order to develop an understanding of these gaps and present insights to fill some of these gaps in the KSA context. In order to fill these gaps and to meet these aims, the following research questions have been formulated:
1) What are the experiences of male teachers and 10-12 year-old students of teaching and learning thinking skills in the KSA primary curriculum?
2) What factors appear to guide teachers’ and students’ experiences of thinking skills?
3) What are the main perceived challenges facing teachers and students when they are teaching/learning thinking skills?

1.4 Significance of the study

This study has several potentially significant aspects. One of these is that, as indicated, thinking skills research in the area of primary school provision, and particularly in the sociocultural context, is lacking in KSA; in contrast to many Western countries, thinking skills research is only just beginning in the KSA. In this connection, because most thinking skills research findings have emerged in the Western world, the study will present a different aspect, focusing on a Middle Eastern country having a different ethnicity, background and values.

The importance of studying thinking skills in their sociocultural context is that cultural factors appear profoundly to guide teachers’ and students’ thinking, modes of thought and subsequent behaviour. Also, the current study highlights how the sociocultural approach is significant in exploring the interactions and complex relationships among different participants in a sociocultural context in light of the absence of such an approach in the KSA context. I aim to move beyond those factors to reformulate and rethink with different assumptions. Such assumptions could potentially direct and reform the teaching and learning thinking skills process in the classroom, form the foundation of professional development, and enhance the quality of teaching and learning thinking skills education.

The results of this study will seek to serve in developing primary education in the KSA. Future developments in policy and practice in primary instruction may be informed by its findings as it will present as clear a picture as possible of current practice in the teaching of thinking skills in primary education curricula, in terms of exploring the challenges presented by the textbook exercises which face teachers and students. Thus, I hope that this study’s results will help the MOE in building and developing primary education curricula and that the study will make recommendations for changes in policy and practice. In addition, the findings are expected to help teachers to develop their practice regarding teaching thinking skills. It should enable teachers to develop a better understanding by identifying the most important elements of the successful
teaching of thinking skills, as revealed by the study, within the reality of practical teaching/learning contexts. Therefore, I hope that this study’s results will help to provide insight into teachers’ views, and permit a deeper understanding of thinking skills processes. Also, this may have a positive impact on the achievement of students in the KSA context.

Another significant aspect is that this study will help in identifying the most important challenges that face teachers and students when teaching/learning thinking skills in the classroom, within the reality of practical teaching/learning contexts. Thus, I hope that this study’s results will help the MOE in building and developing primary education and produce recommendations for changes in policy and practice which should mitigate the problems identified.

Due to the originality of this study in its field, it could open the way for further studies and serve to inform other comparative studies in thinking skills in the KSA context. Finally, as the KSA is one of the Gulf countries and part of the Arab world which shares the same religion and language and has a similar cultural background, it is anticipated that its findings might be relevant to other Gulf and Arab countries, taking into consideration the context in which the study was carried out.

1.5 Study Context

1.5.1 Background to the Study

The KSA occupies most of the Arabian Peninsula, having an area of about two million square kilometres, making it the world’s 14th largest state. The Arabian Peninsula is not only the homeland of the Arab peoples but also the homeland of Islam which was founded in Makkah where, in the 7th century, the prophet Muhammad proclaimed Islam. Thus, the Arabian Peninsula played an important role in the early history of Islam. In its modern period, the emergence of the family dynasty began in central Arabia in 1744 through the First, Second and, currently, Third Saudi State. The Third State was initiated in 1902 by Abdul-Aziz bin Saud (1882–1953). From its foundation in 1932, the KSA’s system of government has been a monarchy. In 1936, oil was discovered, resulting in a rapid period of evolution. Oil revenues allowed for the rapid development of different aspects of daily life; they led to complete changes in society and in individual lifestyles and attitudes, especially in the style of thinking about many aspects of daily life. In 1992, the proclamation of the Basic Rule of Government stated that the KSA is a monarchy and the constitution is
governed on the basis of the Sharia (Islamic Law). The last census of the KSA’s population, in 2010, showed the population to be about 27 million, including an estimated eight million resident foreigners who form about 25% of the population (Central Department of Statistics and Information, 2010).

![Figure 1.1 Map of the KSA](http://mapsof.net)

Figure 1.1 Map of the KSA (Source: http://mapsof.net).

1.5.2 Characteristics of the KSA society

In recent years, many studies (e.g. El-Sanabary, 1992, 1994; Mazawi, 1999; Simmons, 1999; Wiseman and Alromi, 2003a, 2003b) have sparked renewed interest in the characteristics of Middle Eastern societies; these studies have focused on the unique relationship between religion and culture in social life. A great importance is attached to religion in social life and, consequently, within education: "Islam has become ingrained in the governance, curriculum and technical process of schooling in the Gulf States" (Wiseman and Alromi, 2003a: 212). To understand the history, culture, society and politics of the KSA, it is necessary to realize that Islam has powerful effects, not only on the Muslim’s life, but also on every aspect of the KSA. This cultural and historical heritage has deeply affected the policies and regulations of the KSA education system, for example in this statement of the aims of education:
The main educational goal is to understand Islam in a proper and comprehensive way; implanting Islamic doctrine and propagating it; providing the student with values, Islamic teaching and high principles; giving the student knowledge and different skills; development of constructive behavioural attitudes; the development of society in the economic, social and cultural fields and preparing the individual to become an active member of society. (Education policy in the KSA, 1978: 5)

Another characteristic of KSA society, as in most Arab and Islamic nations, is the importance of the family. Despite the social changes related to oil revenues and Western influences; the family still has a key place within the social fabric. Many studies (Ali, 1990, 1995; El-Sanabary, 1994; Simmons, 1999; Noer et al, 2007) have shown that education in the KSA is heavily influenced by Islamic cultural values and strong tribal and family orientations, such as loyalty to the immediate family, the group or the extended family. Education in the KSA, as in most Muslim countries, is a microcosm of the KSA society; it is structured on cultural conservation and social control (El-Sanabary, 1994). Results of a study by Simmons (1999) show the importance of religious education in the KSA curricula. In this regard, in accordance with Islamic law the educational system in the KSA segregates schools according to gender, therefore, boys’ and girls’ education is segregated in terms of school buildings, students and teaching staff.

1.5.3 The KSA Educational System

When the KSA was founded, education was not available to everyone and was limited to individualized instruction. The educational activities focused on by mosques and ancient education schools are literacy and the reading of the Quran. The real start of formal education in the KSA began in 1925 when the 'Directorate of General Knowledge' was established; covering the various educational levels and types. In 1954 the 'Directorate of Knowledge' became the Ministry of Education (MOE), followed by the Ministry of Higher Education (MOHE) in 1975, and these bodies have the responsibility of being the main education service providers. This phase was characterized by horizontal growth of all types of education, including general and higher, as characterized by the presence of specific targets according to national development plans.

In 1970, a policy document on education in the KSA was issued as a formal announcement of the foundations and principles of education. The KSA policy document required (1970) that students should be provided with a range of skills and knowledge, in order to develop in constructive directions. It also
emphasized that the function of education was to help individuals to develop socially, economically and culturally, as well as becoming useful members of society (Education Policy in Saudi Arabia, 1978). Above all, the policy document stated that students should understand Islam in a correct and comprehensive manner, and that education should furnish students with the values, teachings and ideas of Islam. In addition, the KSA policy documents assume that education should provide students with a range of skills and knowledge, in order to develop their abilities in constructive directions. The policy emphasizes the nation’s social, economic and cultural development, as well as the preparation of the individual to become an intellectually capable and useful member of society-beginning with school education.

In the KSA, the MOE is responsible for the education policy of the whole country. It is responsible for the provision and equipping of school buildings, and the design and supply of textbooks throughout the country, as textbooks are standard throughout the KSA. Table 1.1 shows summary statistics on general education including schools, classes, students, teaching staff and administrative staff, all under the supervision of the MOE in 2010/2011.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Schools</th>
<th>Classes</th>
<th>Students</th>
<th>Teaching Staff</th>
<th>Administrative staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kindergarten</td>
<td>1,667</td>
<td>6,617</td>
<td>117,653</td>
<td>11,431</td>
<td>2,247</td>
</tr>
<tr>
<td>Primary</td>
<td>13,628</td>
<td>127,756</td>
<td>2,513,815</td>
<td>228,325</td>
<td>11,952</td>
</tr>
<tr>
<td>Intermediate</td>
<td>7,999</td>
<td>49,215</td>
<td>1,198,414</td>
<td>122,480</td>
<td>6,345</td>
</tr>
<tr>
<td>Secondary</td>
<td>5,013</td>
<td>41,978</td>
<td>1,125,602</td>
<td>102,416</td>
<td>4,798</td>
</tr>
<tr>
<td>Develop</td>
<td>294</td>
<td>4,375</td>
<td>80,746</td>
<td>7,389</td>
<td>363</td>
</tr>
<tr>
<td>Special Ed.</td>
<td>1,594</td>
<td>5,231</td>
<td>27,138</td>
<td>7,859</td>
<td>334</td>
</tr>
<tr>
<td>Adult Ed.</td>
<td>3,086</td>
<td>8,067</td>
<td>82,797</td>
<td>10,197</td>
<td>50</td>
</tr>
<tr>
<td>Total</td>
<td>32,986</td>
<td>238,864</td>
<td>5,066,419</td>
<td>482,708</td>
<td>25,726</td>
</tr>
</tbody>
</table>

Table 1.1: The number of schools, classes, students, teachers and administrative staff [http://portal.moe.gov.sa/Pages/stats31-32.aspx]

The general educational stages in the KSA are classified into four. Stage I, the kindergarten stage, is optional as a pre-school stage. These schools accept children between the ages of three and six. Stage II, the primary stage, is the first stage of compulsory education and is of six years duration, taking children between the ages of six and twelve. From the beginning of this stage, education provided for boys and girls is segregated. Stage III, the intermediate stage, lasts for three years, between the ages of twelve and fifteen. Stage IV, the secondary school, including develop secondary, has a duration of 3 years, from 15 to 18
23
years old. Since the current study concentrates on teachers and students in the primary stage, more details about the primary stage are explained below.

Primary education in the KSA is considered the fundamental basis of education in all subsequent stages. Primary education tries to provide a minimum of information, skills and experience seen as enabling the student to be a good person, able to assume his/her responsibilities as an individual and as a member of society. The key policy document on education in the KSA sets out the aims of education at the primary level. The classification of these is shown below:

1. The practice of good conduct and virtues.
2. Development of life skills and skills in literacy and numeracy.
3. Provision of relevant general knowledge.
5. Development of consciousness of the child’s duties and rights within their level of experience.

The aims clearly reflect the knowledge and social values considered important in 1978, and thus form an important link with this study. Aims 4-5-6 are clearly reliant on the development of students’ skills, experience and ability involving thinking skills across the curriculum.

The primary Islamic education curriculum has nine lessons per week involving five subjects (Al-quran, Tajoid, Monotheism, Alhadeth and jurisprudence); while the science education curriculum has only three lessons per week. This may be one of the main reasons behind why there is imbalance between Islamic Education classes and science classes examples. The examination system for primary education in the KSA is through the adoption of a continuous assessment system which has a daily short test on student skills. Teachers of Islamic education and science have to have a Bachelor’s degree in the subject taught. Thinking skills in both curricula have adopted an infusion approach.

Currently, the primary stage has benefited from various projects to reform both curricula, such as King Abdullah Bin Abdulaziz Public Education Development Project and, in particular, the Tatweer Project which aimed to improve and develop curricula (Project duration is six years, 2007 - 2013). In addition, another project is the Developing Science and Mathematics Curriculum Project, starting in academic year 2009-2010 and aiming to develop high quality educational curricula involving the development of higher-order thinking skills. In this project, the MOE in cooperation with McGraw-Hill Education is
adopting, preparing and printing new science and mathematics global curricula, in all phases of general education, aiming to benefit from international experience of excellence in the science and mathematics area.

1.5.4 Thinking skills in the KSA Educational System

The development of children’s thinking skills in primary schools by adopting the infusion approach to thinking skills through textbooks is one essential aspect of projects to develop the education system, but is at a very early stage in the KSA compared with many Western countries. The accelerating pace of change in the wider world, the arrival of globalization and the intensity of international cultural contacts have led to the need to apply a modernizing approach to such systems, so that the newly emerging generation is able to adapt to the challenges and demands of the new global social order, integrating future-orientated education with conservative social values. There has been a growing debate about the mismatch between inputs and outputs in the KSA education resulting from the considerably increased numbers of concerned intellectuals, experts and parents.

To develop the education system, the MOE has striven to implement its policy of teaching thinking skills across the curriculum by efforts to develop and improve the status of thinking skills in textbooks. In light of the above, thinking skills is an essential part of a movement in education striving to address these problems, through helping students improve their cognitive abilities. Recently, thinking skills have been introduced in the KSA Curriculum alongside key skills (e.g. Numeracy, information and technology skills).

In summary, there are very few references available on teaching and learning thinking skills in the KSA. The firmest evidence showing the KSA government’s commitment to promoting thinking skills in the education system is the MOE’s offer to implement thinking skills through its projects within the school system. The MOE has adopted a new plan to embrace the infusion approach to thinking skills through school textbooks. This commenced in 2002 when the MOE established workshops for supervisors to provide thinking skills through the infusion approach in the Islamic Education curriculum (Al-abduKarim, 2007). In 2003, the MOE established the ‘Development of Thinking Skills’ program as the main source for developing thinking skills in all regions. To support this work, in 2004 the MOE issued the first edition of the ‘Teacher’s Guide for the Development of Thinking Skills’ directed at lead teachers. Then,
in 2007, the MOE issued a second edition with added practical examples of how teachers could develop thinking skills through most school subjects.

Curriculum materials are another obvious resource confirming the MOE’s commitment to the implementation of thinking skills. In 2007-2008, the MOE started to reform the thinking skills curriculum in some textbooks, by explicitly adopting an infusion approach in some subjects such as Islamic Education. For example, in the introduction of the book of Islamic Education (2007-2008), the Ministry of Education wrote that “[we] added a number of diverse activities to their goals, including those aimed at developing thinking skills [to learner]” (ibid: 4). Also “Some of the questions by their nature have no single correct answer ... That means to say that we need to learn and develop the skills of thinking” (ibid: 45). In 2008-2009 the MOE extended the infusion approach to mathematics and science textbooks as a main part of the Developing Science and Mathematics Curriculum Project as mentioned earlier. Across the science and mathematics curricula the development of thinking skills is clearly key, and this is incorporated through the teaching units and exercises in a systematic way.

However, the MOE’s efforts regarding the application of thinking skills across the curriculum have been subject to some criticisms. One of early studies came from Al-sughayer (2007) who argued that, in spite of the conviction of educationalists in the KSA of the importance of applying thinking skills across the curriculum, this had not been translated into reality. Our education had stalled in its progress towards what must be achieved to build human consciousness and good citizens through attention to feeding the mind and the development of thinking (Al-sughayer, 2007). In addition to this criticism, there is a lack of transparency and clarity about the MOE’s efforts regarding the application of thinking skills across the curriculum. This lack of clarity occurs in its policy, the supervision and evaluation of efforts to implement thinking skills, and the lack of research studies and official reports on the topic.

1.6 Organisation of the Thesis

The thesis is presented in eight chapters. Chapter One presents the rationale, aims, questions and significance of the study. It also gives the study setting in detail, describing its background context, in terms of the social, cultural, and educational situation. Chapter Two reviews the existing literature focusing on areas linking to the research questions. Chapter Three outlines the design and methodology of the research. Chapter Four discusses the analytic approach to the data. An analysis of the thematic findings from the instruments of data
collection is presented in Chapter Five. Chapter Six reports a summary of all seven case classrooms, in addition showing an in-depth examination of two particular cases selected as examples. A summary of the study in relation to the existing literature, are presented in Chapter Seven. Also, in Chapter Eight a discussion of the overarching thematic of the study findings that emerged from the data analysis. Finally, an overview of the study, its implications for teaching and learning thinking skills in the KSA context, and recommendations for further research are presented in Chapter Nine.

1.7 Chapter summary

This chapter has provided a statement of the research rationale, aims, questions and significance of the study. It has also has introduced the context of the study, describing the study’s background and some characteristics of the KSA society. It included a brief look at the KSA educational system and the place of thinking skills within this system. The organisation of the thesis was also outlined. The next chapter will consider the literature, focusing on areas linked to the research questions.
Chapter Two

Literature Review
2.1 Introduction

The chapter considers relevant literature concerning thinking skills in education. It starts by presenting various definitions of thinking skills, with views from different countries. It goes on to discuss the importance of thinking skills, along with a review of the debate surrounding the teaching of thinking skills. Next, thinking skills frameworks are outlined, and models and programmes of teaching thinking skills across the curriculum are explained. In addition, the teaching and learning of thinking skills are described and discussed, including the question of whether thinking skills can be taught. The teaching and learning of thinking is placed within a sociocultural perspective and then the major components of these skills are explained. This section also identifies and describes a variety of strategies that have been used for organizing introductory skill lessons, as well as principles for employing these tools. Teaching thinking skills in the KSA is introduced next. The chapter then considers some of the challenges to the teaching of thinking skills. Finally, it gives an overview of the literature, leading to the questions the research will address.

2.2 Definitions

2.2.1 Introduction

In the research literature there is no clear consensus from scholars about a definition of thinking skills and what constitutes skilful, good quality, and effective thinking (McGregor, 2007). However, there are some common characteristics of thinking skills among the different definitions; therefore, in this section I will present a variety of definitions, but with common characteristics, from the UK, Asia and the Middle East, in order to obtain diversity and access to the appropriate definition for this study. Then, I will present my view of thinking skills as I believe it links with the nature of this study.

Since ancient times, societies have been concerned with forms of learning and patterns of thinking. This has been demonstrated by efforts to improve the art and science of intelligent thinking. For example, ancient Greece was characterized by an interest in inquiry and learners developed thinking skills through Socratic dialogue. In the golden age of Islamic history, people were
also interested in investigation and encouraged the use of the mind in many aspects of life; the use of reason was particularly encouraged to justify aspects of worship and behaviour. The era of the Enlightenment, too, stressed the process of rationality. In contemporary times, efforts to improve the quality and quantity of thinking as a fundamental characteristic of an educated population have resulted from phenomena such as modern technology and rapid social change in countries around the world.

The definition of thinking skills presents complex problems; thus I need to be aware of the many aspects and dimensions of thinking skills with their underlying principles and rationales. Defining thinking skills would help to clarify meanings, especially where words are used in quite different ways in different contexts.

2.2.2 Thinking skills and the sociocultural perspective

For Vygotsky (1962), thinking could not exist without language in that he strongly emphasised that articulation of thoughts was an effective means of connecting thoughts in a conscious way. Dialogic exchange, for example, is essential in the process of learning because it enables children to learn, think and understand in social contexts (McGregor, 2007). Mediation, as the main part of the sociocultural perspective, is a dynamic phenomenon which assumes that human beings and the environment cannot be considered in isolation. So, an underlying assumption in mediation is that humans’ access to the world, in large part, is indirect, or mediated (Wertsch et al, 1995). In this regard, Rojas-Drummond et al (2008) argue that the development of cognition and academic education seem to be cultural processes because knowledge and understanding are not only individual procedures but are also constructed among communities through activities which are shaped by their culture context.

A number of essential features of the sociocultural perspective are reflected in many of the definitions of researchers, such as Wegerif (2002: 7), who presents a definition of thinking skills as: "those things that practitioners believe can and should be taught or encouraged in order to improve the perceived quality and/or the effectiveness of students’ thinking". Moseley et al (2005a: 13) present a definition for ‘teaching thinking skills’ in an educational context as: "courses or organized activities which identify for learners translatable mental processes and/or which require learners to plan, describe and evaluate their thinking and learning". Lipman (2003: 162), also, presents a definition of the nature and characteristics of thinking skills as: thinking skills are a 'catchall phrase'
containing endless 'sequenced, synchronized, and orchestrated ' lists of human intellectual activity.

Teaching thinking skills implies that thinking can be improved with practice and with the skilled intervention of a teacher. It assumes that the learner can be made aware of their developing skills and therefore use mental processes to plan, describe and evaluate thinking. The goals of thinking may be to collect, understand or use information.

2.2.3 Definitions from the UK, Asia and the Middle East

Thinking skills, also, can be understood as basic and advanced skills that organize the individual’s mental processes. The Thinking Skills Review Group, co-ordinated at the London University Institute of Education, in undertaking a review of thinking skills, identified thinking skills as:

- Approaches or programmes which require learners to articulate and evaluate learning approaches and/or strategies
- And/or those which identify specific cognitive, affective or cognitive processes that are amenable to instruction. (Thinking Skills Review Groups 2002: 2)

The introduction to the thinking skills section of the National Curriculum for England (Department for Education and Skills, 2006) succinctly sums up a common view of thinking skills from a classroom practitioner’s point of view (although this was to change – whilst in 2012, when this thesis was completed, England’s schools were still working with the 2006 National Curriculum version, this was looking very likely to change radically away from encouraging essential life skills involved thinking skills toward core knowledge):

1. Information-processing skills;
2. Reasoning skills;
3. Enquiry skills;
4. Creative thinking skills;
5. Evaluation skills.

In addition, there are numerous taxonomies of thinking skills available in the literature of thinking. They include "some reference to sequencing and sorting, classifying, comparing, making predictions, relating cause and effect, drawing
conclusions, generating new ideas, problem solving, testing solutions, making decisions and so on" (McGuinness, 1999, 2). However, thinking skills are not just about abstract cognitive processes.

Scholars (e.g. Hongladarom, 1999; Ng, 2001; Craft, 2008) have claimed numerous differences between the Asian cultural background and the Western one. A question which may arise here is whether these reflect different thinking skills, or different definitions of thinking skills. Western educators who teach in Asian countries have noted that there are some difficulties and problems they meet while trying to teach thinking skills, especially critical thinking (Hongladarom, 1999). It is difficult to ignore the effect of cultural background on thinking skills but this is not necessarily reflected in how thinking skills are defined, in spite of the lack of clarity in the concept of thinking skills, as previously noted. The effect of cultural background on thinking skills can be seen in certain aspects of thinking skills. Ng (2001) claims that Asians are less flexible when dealing with some elements of thinking skills than Westerners because Westerners live in a liberal individualistic society that encourages these elements of thinking whereas Asians live in societies that place a higher value on conformity to the group. However, Hongladarom (1999) claims that there are not clear differences between Asians and their Western counterparts in other kinds of thinking skills, particularly in critical thinking. Nevertheless, it could be argued that differences detected by researchers reflect not differences in capacity but in the application of such thinking skills according to what is valued culturally.

In the Middle East, Scholars such as Yoram (2007) argued that ‘thinking skills’ means ‘understanding’, while Habib (1996) defined thinking skills as the learner’s ability to explain, define, understand and practise mental processes requiring speed, accuracy and mastery. Qatami (2004) emphasised that ‘thinking skills’ includes the assumption that thinking, like any skill, can be learned and transferred to be employed in new situations in the academic field or in life generally. Jerwan (1999) stressed that thinking skills are specific operations of practice and include aspects of information processing such as the identification of the problem, finding the assumptions other than those mentioned in the text, and evaluating evidence.

One of the main arguments relates to the scope of the term ‘thinking skills’. It focuses on the broadness or narrowness of ‘thinking skills’ and on whether this term includes other skills such as critical thinking skills. McPeck (1990) typifies the argument that thinking skills are usually limited to specific areas or quite narrow areas of application. His view is that thinking is always thinking about something so it is senseless to argue for ‘thinking in general’. Thus, the skill is not general, rather, the field of application is. On the other hand, there is
contention about the issue of whether thinking skills should be taught explicitly in the educational curriculum. Smith (1992) believes that thinking skills is an integral element of all education processes which cannot be separated out.

In the context of teaching and learning thinking skills in the classroom, my view is that ‘thinking skills’ mean: the purposeful, constructive organization of knowledge and understanding that occurs through meaningful activity across the curriculum, in the light of new and previous experience, which aim at nurturing the development of the thinking abilities of students via conscious reflection.

2.3 Importance of thinking skills

Thinking skills are an important key to success in today's rapidly changing world (Cotton, 1991; Qatami, 2004; Adey et al, 2007). We are entering a time in which in less than 5 years knowledge will double, and the projection is that in 2020 it will double every 73 days (Costa, 2006). Development, the economy, problem solving, and rapidly changing technology are all examples that need thinking skills. Education faces challenges that are without precedent; thus, thinking skills are viewed as crucial for educated persons to cope with these rapid changes. Establishing new priorities in the education system and creating a balance in teaching and learning in the curriculum is essential for meeting these challenges (NACCCE, 1999). Thinking skills are now required in every setting, including individual, community and economic realms.

Our world has shifted from an industrial mode of society to a learning society (Costa, 2006). The role of education lies not only in the acquisition of cognitive skills but in strengthening and improving those skills. Thus a learning society requires moving beyond cognitive skills to the characteristics of individuals which involve the development of individuals’ knowledge management and habits of intelligence which are essential to employ in learning throughout life in a learning society (Costa, 2006). Consequently, these challenges have become pressing within our educational system to develop school-leavers’ ability to identify coherent alternatives, and to look for evidence and reasons for their beliefs in themselves and in the social context, to permit them to change consciously.

There are many benefits which may accrue when thinking skills become an essential part of classroom life, involving promoting pertinent thinking dispositions, encouraging the language of thinking and good interaction and transfer of the knowledge, skills, values and strategies to learners’ everyday
lives, via encouraging independent thinking and meaningful, deep learning in the classroom. It is widely agreed that learning and thinking are active mental processes and that it is valuable to apply these skills in meaningful real life situations (Moseley et al, 2005a). In addition, a number of studies have demonstrated that thinking skills processes accelerated participants’ learning gains in academic subject domains (Cotton, 1991). Therefore one of the general targets of teaching thinking skills is that students will be equipped with the skills to ‘think for themselves, to be self-initiating, self-modifying and self-directing’ (Costa, 2006: 62; Italic in the original). The significant question arising here regarding the significance of thinking skills in an educational context is: What would education without thinking skills look like? Of course, the alternative style of learning and teaching in the classroom is the traditional method based on rote memorization followed by regurgitation in the form of tests and quizzes, as occurs in some parts of the education system in the KSA, as I will discuss later.

One of the main criticisms of the teaching of thinking skills is that there is no real evidence for their effectiveness (e.g. Salomon and Perkins, 1989; Hennessy et al, 1993). To respond to these allegations, McGregor (2007) emphasised that there is substantial evidence that programmes which focus on teaching thinking can improve the academic performance of pupils, their cognitive processing and their problem solving abilities among subject areas.

An important empirical study was carried out by Burke and Williams (2008). The purpose of this study was to examine the effectiveness of teaching thinking skills explicitly by infusing thinking skills approaches into the curriculum. The results of this study showed positive, statistically significant improvements in a range of thinking skills in both the individual and collaborative learning situations. One of the main findings indicates that pupils’ concepts of thinking and their thinking skills could change as a consequence of a concentrated intervention. Also, results demonstrated statistically that there was a strong positive correlation between children’s weekly performances through the intervention and their general thinking skills development.

In the context of collaborative learning situations and their impact on the development of thinking skills, Wegerif (2000) conducted a teacher–researcher intervention in collaborative learning conditions. His findings indicated that collaborative learning improves individual children’s ability to reason. In this connection, a number of other studies echo these findings that collaborative learning enhances students’ thinking (e.g. Gokhale, 1995; Denis and Hubert, 2001; Burke, 2007; Wix and Steiner, 2008).
Other significant evidence includes a review by Trickey and Topping (2004) of ten controlled studies using pre–post measurement of experimental and control or comparison groups that met the strict criteria for inclusion. These ten studies examined the following outcomes from P4C:

- Logical reasoning (Lipman et al., 1980; Williams, 1993; Sasseville, 1994; Institute for the Advancement of Philosophy for Children, 2002);
- Reading comprehension (Lipman and Bierman, 1970; Haas, 1975; Williams, 1993; Dyfed County Council, 1994; Fields, 1995);
- Mathematics skills (Fields, 1995);
- Self-esteem (Dyfed County Council, 1994; Sasseville, 1994);
- Listening skills (Dyfed County Council, 1994);
- Expressive language (Dyfed County Council, 1994);
- Creative thinking (Education Testing Service, 1978);
- Cognitive ability (Doherr, 2000); and

Trickey and Topping (2004) argued that these ten controlled studies seemed to be the most appropriate ones to establish causal relationships; they examined the following outcomes from Philosophy for Children (P4C). P4C originating in the children’s stories written by philosopher Matthew Lipman (Taggart et al, 2005). P4C is widely used in the UK and it is associated with Matthew Lipman who has written extensively about teaching in this approach which seeks to develop pupils’ philosophical skills such as reasoning and questioning evidence. They provided encouraging findings, plus successful evaluations of P4C in primary and high schools. These ten studies, measuring results by norm-referenced tests, demonstrated better academic results in various subjects including reading, reasoning, cognitive ability, and other curriculum-related abilities. They measured self-esteem and child behaviour, from questionnaires for both children and teachers. All these ten studies showed positive outcomes. The findings of these studies, which are all related to P4C, confirm that holistic and embedded skills acquired in one context in the instruction process can be applied and transformed into many other contexts.

Furthermore, other important evidence includes a review by Marzano (1998), who conducted a meta-analysis of over 4,000 studies with large effect sizes that involved an estimated 1,237,000 subjects. This meta-analysis adopts a standardized measure of the differences between experimental and control groups. The overall domain of the meta-analysis is the effect of classroom instructional techniques, ‘an alterable behavior on the part of teachers or students’ (p.66). The theory used for this meta-analysis assumes the interaction of four elements of the operation of human thought as being necessary for effective learning: (1) knowledge, (2) the cognitive system, (3) the metacognitive
system as the engine of learning, and (4) the self-system as the control center for human behavior. Marzano (1998) emphasised that each of those elements has linguistic, non-linguistic and affective components. The metacognitive system here is seen to be 'the primary vehicle for learning' which has powerful effects as tools supporting students’ skills at knowledge processing. Marzano (1998) emphasised that these four elements enhance mental processes within the cognitive system and change the beliefs and processes within the self-system to improve effectiveness at learning; in short, the metacognitive system is 'the engine of learning'.

I believe it is time to move beyond the simple measurement of thinking skills programmes and their effects on attainment towards focusing on the quality of thinking skills education. This can be done by exploring the prospects for teaching and learning thinking skills, discovering the conditions which appear to guide teachers’ and students’ experiences of thinking skills, as well as identifying possible challenges faced by teachers and students when teaching and learning these skills. Solutions could then be found to get the maximum possible awareness to address these issues and enhance the quality of thinking skills instruction in the classroom. The present study tries to achieve this goal in the KSA context, constituting a building block within this larger work.

2.4 Thinking skills frameworks

Several taxonomies in the literature have produced frameworks for understanding thinking and learning. There are broad frameworks with different designs, such as hierarchical frameworks (e.g. Bloom et al, 1956; Marzano et al, 2001) linear frameworks which emphasise sequencing (e.g. Hannah and Michaelis, 1977, cited in Moseley et al, 2005a; Lipman, 2003); and pie frameworks which focus on sorting and comparing (e.g. Lipman, 2003; DfES, 2008), among others. Each of these frameworks has significance in attempting to explain aspects of thinking.

One of the most widely accepted systems of organization of essential elements of effective thinking is the pioneering work of Bloom et al (1956). He identifies the fundamental cognitive objectives of knowledge, comprehension, application, analysis, synthesis and evaluation. Bloom’s taxonomy has proved helpful to the type of thinking skills that educationalists are incorporating in curricula and classrooms to meet the needs of educational systems (Wegerif, 2007). However, critics (e.g. Harmon and Jones, 2005) of Bloom’s taxonomy point out that this model deals with thinking processes in isolation without
dealing with the way these processes can act differently on different types of knowledge. They also raise questions about the existence of a link and hierarchy between each stage. However, Bloom’s taxonomy helps teachers make informed decisions in their lesson plans about which levels of thinking skills may be addressed in any activity of the learning and thinking process in the classroom.

In this section I will present two models of thinking skills, of which the main model is that of Moseley et al (2005a; 2005b), then I will identify other complementary frameworks which together provide comprehensive coverage of thinking skills. The main reason for presenting other models is that the Moseley et al model might be seen as lacking the social and cultural features that are relevant to my research. Therefore, I chose Sternberg’s model of thinking skills because it provides coverage of the emotional factors and the influence of context. Further justification for choosing these particular models will be given later in this section.

2.4.1 The Moseley et al model

Moseley et al (2005a; 2005b) listed the principles used in 55 thinking skills frameworks, classifying those under four main headings as follows: domain, content, process and psychological. In addition, they emphasise that they did not find one framework which could be recommended as an integrated framework for widespread application. Instead they present their own framework of thinking skills which they call: An integrated model for understanding thinking and learning. They claim this framework is an integrated ‘all-embracing’ framework which acts as a prototype, unifying factors from different models. There is a two-tier model in this framework which distinguishes between strategic and reflective thinking and cognitive skills, forming an ‘all-embracing’ four-category framework of thinking skills which consists of: 1) information gathering; 2) building understanding; 3) productive thinking; and 4) strategic and reflective thinking. The next sections give definitions for each term, and describe some of their characteristics.

Firstly, Information-gathering is “a prerequisite for either building understanding or productive thinking, but it is not necessarily a simpler or less conscious process” (ibid: 315). Information-gathering tends to move thinking along and influences where and when progress will take place, by determining what is already known and whether anything similar has been done before. Secondly, building understanding is a basic thinking process involving easy ways of understanding, interpreting and using knowledge. Moseley et al
(2005a) show that there are transmutations between the first and second categories because, in the thinking process, information can transform into understanding, also understanding into information.

Thirdly, productive thinking is an essential learning process which leads the learner to an in-depth understanding of the nature of what they are learning, and to the justification, implications, and assessment of what is known; these processes may include planning what the learner will do and say, by various methods such as imagining situations, solving problems and reasoning, in order to create new perspectives and produce valuable outcomes. The important point about productive thinking is that both critical and creative thinking are included under the classification of productive thinking; not only that, but, caring thinking, in Lipman’s terms (2003), can also be classified as productive thinking (Moseley et al, 2005a). Productive thinking is seen as the process whereby you "seek and actively use feedback and support from relevant sources to help you to meet targets" (p.318).

The fourth category is strategic and reflective thinking. Moseley et al (2005a) described these as focusing on how the vision can be achieved; whether or not there should be a change in strategy in the light of past and new experience; as well as what changes could become routine operations in the learning experience. Furthermore, both strategic and reflective thinking can be really valuable in dealing with issues such as beliefs or experience. They are effective at the initiation of activities that place a great deal of demand on an individual. When thinking is strategic and reflective, that means that the process of learning ‘is more likely to occur’ (p.315). Thus, strategic and reflective thinking processes should be a key aim of higher education, and equally significant in lifelong learning for every age.

When Moseley et al (2005a) deal with strategic and reflective thinking, they often tie them together, such as in the quote: "when thinking is strategic and reflective (involving the exercise of conscious purpose and a carefully executed plan), meaningful learning is more likely to occur" (p.315). However, the distinction between them is that strategic thinking is seen as management of thinking by adapting a strategy with the benefit of previous experience which is reflected upon to form a plan to be used in the future, aiming to produce the quality of outcomes required. On the other hand, reflective thinking is defined as "monitor[ing] and critically reflect[ing] on what you are learning and how you are learning, noting the choices you make and judging their effectiveness" (p. 318).

It could be argued that there is a link between what Moseley et al (2005a) call 'reflection' and what others call 'metacognition', as exemplified at several points...
in their treatment mentioned above. At one point they say "... strategic and reflective thinking are always highly conscious and are often experienced as involving will and/or emotion as well as cognition... they require sustained concentration, not only on the matter in hand, but also on how a task is conceived and whether or not there should be a change of strategy in the light of new and previous experience" (p.315); where as Flavell (1979) argues that the components of metacognition consist of 'metacognitive knowledge' and 'metacognitive experience' and he emphasises the importance of meaningful actions and interactions among cognitive enterprises. According to Brown (1987: 66), metacognition refers to "one’s knowledge and control of one’s own cognitive system".

In addition, Moseley et al (2005a) believe that reflective thinking can be effective at the initiation of activities, as well as really valuable in dealing with issues such as communication problems. Marzano (1998), in a review of a large body of literature, presents a summary of dispositions pertinent to good metacognition: accuracy and precision, clarity, restraint of impulsivity, intensity of task engagement and task focus. In addition, Cotton (1991) adds other aspects of metacognition which can be included: awareness, self-monitoring, and self-regulation. So, a number of authors (e.g. Marzano, 1998; McGuinness et al, 2005; Moseley et al, 2005a; Burke and Williams, 2008) emphasise the important role of metacognition in the thinking skills field as being at the core of all thinking activities. In the same regard, Moseley et al (2005a) argue that reflective thinking is a key aim of higher education and lifelong learning.

Given the lack of any unifying or overarching theory, the difficulty of setting clear limits for the classification of thinking skills, and the overlapping zones between many types of thinking, must be recognised. Given the claim of Moseley et al (2005a), their model involves a number of advantages, one of which is its structure. Moseley et al (2005a) believe that the two level model is better than a multilevel hierarchy for representation of how people think. Moseley et al (2005a) claim that this model is easy to comprehend, that it incorporates the range of ways in which children think reflectively and strategically, that it incorporates the building of understanding and the skills of gathering of information. Furthermore, this model allows for the possibility of relationships between strategic and reflective thinking and cognitive skills; it creates more opportunity of interaction via the two-way arrows. However, cognitive skills can be exercised effectively without planning and reflection. In addition, the three components in the cognitive skills (information gathering, building understanding and productive thinking) part of the framework are not meant to imply that all thinking processes involve 'the middle level of building understanding' (p.315). It is also possible to go directly from information-gathering to productive thinking. This model is flexible as shown by the dotted
lines in the following diagram which demonstrate the possibility of commuting between information-gathering and understanding in the thinking process.

<table>
<thead>
<tr>
<th>STRATEGIC AND REFLECTIVE THINKING</th>
</tr>
</thead>
<tbody>
<tr>
<td>engagement with and management of thinking and learning, supported by value-grounded thinking (including critically reflective thinking)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>COGNITIVE SKILLS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>information gathering</strong></td>
</tr>
</tbody>
</table>

Figure 2.1. An integrated model for understanding thinking and learning Moseley et al (2005a)

As we can see above, there are a number of advantages with this model, such as that this model is not restricted to the cognitive domain as it includes strategic and reflective thinking as well as critical, and creative thinking. Furthermore, Moseley et al (2005a) emphasise that their model applies to all kinds of thinking, and that their model is applicable to the thinking of groups and organizations as well as individuals. Moreover, in this model there is a clear view of the distinction between cognitive skills and strategic and reflective thinking in terms of the nature and quality of experience and the conscious awareness of strategies. Thus Moseley et al (2005a) explain that the procedures of cognitive skills can happen automatically or may be associated with effort or emotion, while the procedures of strategic and reflective thinking are always associated with highly conscious effort or emotion. This is because they require continued concentration, as well as being processes that require reflection in the light of previous and new experience.
2.4.2 Sternberg’s model of abilities as developing expertise (2001)

The model of developing expertise comes from a dynamic view of the relationship between abilities and expertise as one completely intertwined construct. The concept of ‘developing expertise’ is the heart of Sternberg’s model in that individuals work regularly on developing their expertise when they learn within a given area. This model has five key elements to developing expertise: 1- Metacognition skills which refer to “people’s understanding and control of their own cognition” (p.162); 2- Learning skills; 3- Thinking Skills: these are sets of skills rather than individual skills, including critical (analytical) thinking skills, creative thinking skills and the practical thinking skills of applying, using, and practising; 4- Knowledge; and 5- Motivation. These elements influence each other to a large extent, in specific contexts. Practice, according to this model, requires the dynamic interaction of all five elements.

Essential points of Sternberg’s model of thinking are that it not only incorporates meta-components but also includes emotional factors and the influence of context. As mentioned above, the aim of presenting this model is to provide comprehensive coverage of those thinking skills perspectives which are suited to this study. Therefore, I will focus on the fifth component of this model, which is motivation. Achievement motivation includes a person’s beliefs in their own ability to solve problems in order to develop their own intellectual skills, especially their ‘competence (self-efficacy) motivation’, which refers to a person’s beliefs’ (p.169). The motivation element drives all elements of the model at the same time; without motivation the five elements would remain inert. Motivation’s role is to activate the learning and thinking processes, and then give feedback which then affects the metacognitive skills used, in order to increase one’s level of expertise. In addition, an essential component of Sternberg’s model is context, which emphasises that all the elements discussed are characteristics of the learner which are affected by the particular context in which they operate.
Both Moseley’s and Sternberg’s models were used for dealing with thinking skills in this study, through a number of stages, particularly in light of most participants’ lack of background knowledge regarding thinking skills as will be discussed in Chapter Five. This is an important point which is relevant to both me and my participants, in terms of helping participants to describe their experience of teaching and learning thinking skills flexibly. It will also help me to explain levels of thinking of teachers and students, as carried out in the classroom, in light of the lack of a clear notion of what and how teachers and students are teaching and learning thinking skills. In addition to the essential advantages of Moseley’s model as mentioned above, there is flexibility between sections. Moseley et al (2005a) claim that their model is also appropriate for all ages stages and different kinds and levels of thinking skills. Thus, Moseley’s model will influence understanding of thinking skills for both me and participants in that it will help me when trying to explain the thinking skills terms in greater detail.

Thus, Moseley’s model particularly was used as a model for dealing with thinking skills in this study. It will be useful in dealing with the range of thinking skills found in textbooks and the teaching/learning of thinking skills in the classroom. Also, because Moseley’s model is flexible enough to accommodate most kinds of thinking skills, it will help me to be aware of how teachers and students describe their experience of teaching and learning thinking skills within the KSA primary curriculum. While based on the active and dynamic processes of sociocultural interaction and mediation, Sternberg’s
model was used because it is the key to the context within the sociocultural perspective which informed my study. So, when I discussed with my participants, I assumed both models which helped me to gain an in-depth understanding of how teaching and learning processes work in actual classrooms. In addition, as a researcher, I can recognize that both Moseley’s and Sternberg’s models enable me to extend, to define, to discuss and to understand the teachers’ and the learners’ experience of thinking skills and their immediate needs. Finally, I emphasise that both models were used as guides rather than letting them determine the findings, particularly regarding social and cultural features.

2.5 Models and programmes of thinking skills across the curriculum

Different theorists are interested in different aspects of thinking skills in relation to the curriculum. Moseley et al (2005a) argue that a major part of a curriculum should include programmes for teaching thinking skills, particularly the development of strategies, concepts and thinking skills. Others argue for the social construction of thought with the development of strategies, concepts and thinking skills infused throughout curriculum areas (Burden, 1998). Theories and psychological approaches concerning developing the abilities of the thinking learner are a powerful variable in classroom practice. Work such as that of Fisher (2003) places a stress on active learning and the developing of thinking skills through the planning and development of the curriculum in suitable ways to address this task.

Nowadays, programmes for developing thinking skills have found their way into contemporary curricula and educational processes. Numerous thinking skills models and programmes have been widely implemented in schools across the world. For instance, in Scotland in 2004, the promotion of ‘A Curriculum for Excellence’ which involved various skills was one such initiative, in which Enterprise and Citizenship skills formed the heart (Burke and Williams, 2008). South Africa, additionally, sees the teaching of thinking as a valuable means of raising educational levels and developing social inclusion (Moseley et al, 2005a). In the KSA, as the context of this study, in the last editions of the Ministry of Education textbooks (2007 - 2011), the MOE added a number of diverse activities to their goals, including those aimed at developing thinking skills for learners (Ministry of Education textbooks, 2007 - 2010) as I will discuss later.

In the literature of thinking skills, there are different positions in the argument about the nature of thinking skills which lead to different views about how to
teach thinking skills. Consequently there are three models for delivering thinking skills which are designed to enhance those thinking skills which are identified in school curricula: the ‘discrete’ approach, ‘infusion’ approach and ‘middle-ground’ approaches. I will discuss each one of them and show which one applies to the current situation in the KSA.

First, Discrete Approaches or the ‘interventions’ which this model encourages, teach thinking skills as a discrete subject which is additional to the normal curriculum. This is claimed to have a general effect and to be applicable to specific subjects across the curriculum. The central processor model of the mind led to a direct approach to the teaching of thinking skills in a separate program which was automatically assumed to have a general impact (Wegerif, 2007). Advocates of the discrete approach base their support on the justification that thinking skills can be learned directly by students outside of subject context, like any other skills, such as the mathematical skills of addition and subtraction, or riding a bicycle. Also, teaching directly allows us to focus on the thinking skills rather than on the content of the textbook or curriculum.

In the thinking skills literature, a number of programmes can be classified in this approach such as The Cognitive Research Trust (CoRT), started in 1970 by De Bono, which has been applied in more than 30 countries around the world. In addition, as McGuinness (1999) claimed that one of the most excellent known general thinking skills programme is Feuerstein’s Instrumental Enrichment (IE) which shows positive effects on measures of non-verbal reasoning. Other programmes for teaching thinking skills which have been influenced by discrete approaches are: Thinking Together, Philosophy for Children, Paired Thinking, Lateral Thinking and Brain Gym (Robson, 2006).

Within the discrete approach, a widely used and effective programme is Philosophy for Children (P4C). One essential feature of the programme is that it goes beyond subject boundaries, as well as developing connections and drawing on learners’ experience and knowledge (Moseley et al, 2005a). Another essential idea behind this model is that within these lessons the learner can generalise and transfer some of the generic skills to other situations (Burke and Williams, 2008). Evaluations of this programme have shown positive effects along many dimensions. The review by Trickey and Topping (2004), gave encouraging findings, plus successful evaluations of Philosophy for Children. The findings of Trickey and Topping’s study confirm that holistic and embedded skills acquired in one context in the instruction process can be applied and transformed into many other contexts, as well as developing investigative skills, the ability to create questions, and self-esteem. Transfer is a significant point because practitioners assume that these programmes make students transfer their learning; I will return to the issue of transfer later.
However, Burke and Williams (2008) mention some criticisms of the discrete approach which apply to many of the discrete thinking skills programmes. They argue that many such programmes do not foster the appropriate skills which would be essential attributes of an effective thinker. By teaching thinking skills separately, subject teachers are not trained to integrate the pedagogy of effective thinking into their normal classroom practices. There would also be difficulty fitting an extra subject into a school timetable. Wegerif (2007) concurs with this conclusion in that he emphasizes that it is hard to separate teaching a subject and general thinking. In addition, this may differ across different subjects.

More recently, there have been some programmes that can be classified under discrete approaches or the ‘interventions’ model that are presented as compulsory modules in some universities in the KSA; indeed, I taught one of these programme in the University of Al-Qassim. However, at present there are no programmes which can be classified as discrete approaches in the general educational system in the KSA.

Secondly, the Infusion Approach incorporates the goal of teaching thinking skills as a part of lessons in all curricular areas via systematically identifying opportunities within the normal curriculum. Infusion approaches use generic types of thinking in existing curriculum subjects as a starting point for developing thinking skills (Robson, 2006). Certain characteristics should apply to this approach, such as systematically identifying opportunities in the normal curriculum and training teachers to develop effective thinking skills through their curriculum subjects, such as by encouraging problem-solving (McGuinness, 1999; Robson, 2006; Burke and Williams, 2008). In infusion approaches, essential process aspects of thinking skills, such as transfer and metacognition, can be achieved through the use of thinking diagrams (Burke and Williams, 2008).

In this respect, the teacher can give an example showing how thinking diagrams help learners to imagine the cognitive steps required when applying a range of thinking skills. Skills such as comparing and contrasting can be used by learners to identify objects through their similarities and differences, and interpreting what is suggested (Burke and Williams, 2008). As an example of the infusion of skills, the Northern Ireland curriculum at Key Stage 2 has identified opportunities for developing a variety of thinking skills within scripted lessons (McGuinness, 1999). In addition, the ACTS (Activating Children’s Thinking Skills in Sustainable Thinking Classrooms) adopted an infusion approach where enhancing thinking and the understanding of the subject of the lessons were pursued at the same time (McGuinness et al, 2005).
Some programmes in the KSA can be classified under the infusion approach, because they are incorporated as a part of lessons in major curricular areas (Teacher's guide for the development of thinking skills, 2004). In 2007, the Ministry of Education started to reform the thinking skills curriculum in some textbooks for some subjects by adopting an infusion approach as I will discuss later.

Thirdly, there are the middle-ground approaches or subject-based approaches, which have been mentioned by some authors, such as McGuinness (1999) and Burke and Williams (2008). This middle ground comes from those packages seeking to embed structured thinking skills lessons into a particular curricular area as targeted subject-specific learning. Furthermore, Burke and Williams (2008: 105) explain the relationship between this approach and the discrete and infusion approaches: The middle-ground approach retains the discrete approach in structure, whilst adopting the infusion approach in a more resource-led curricular context. In addition, McGuinness (1999) made a distinction between discrete and middle-ground approaches in that the former promote general thinking skills and are time tabled separately, while the latter are subject or domain specific in curricular areas.

Some programmes which can be classified under the middle-ground approach are Adey and Shayer’s (1993) Cognitive Acceleration through Science Education (CASE) and Leat’s (1998) Thinking through Geography programme which was developed in partnership with geography teachers (Trickey and Topping, 2004).

2.6 Teaching and learning thinking skills

Thinking skills are some of the most essential tools for improving performance in the instruction process in the classroom. A number of researchers (e.g. Nickerson, 1989; Beyer, 1997, 2008a, b) argue that deficiency in these skills may be responsible for reducing the quality of students’ thinking and learning in the classroom. Along the same lines as these authors’ argument, educators should keep in mind that instruction in thinking skills does not only mean that students participate in exercising these skills, but also that students may need to be prompted, and should be provided with the opportunity to apply these skills as best they can. The process of teaching and learning thinking skills involves providing an introduction focusing on these skills, and explaining the relevance of these skills. It also involves the teachers getting support for their practice in the application of these skills, thus increasing the level of experience of both teachers and students.
In this section, I will review some of the work dealing with the main elements of the process of teaching and learning thinking skills, which include: Can thinking skills be taught? This is followed by a discussion of the roots of teaching and learning thinking in the sociocultural perspective. In addition, this section attempts to identify and discuss major components of thinking skills which include: recognizing and discussing the instructional elements that have been used to teach strategies for organizing introductory skill lessons, and which have been used to teach thinking skills within specific social studies contexts; also the role of the teacher and classroom environment.

2.6.1 Can thinking skills be taught?

In contemporary times, a number of surveys have been conducted in order to assess the impact of various programmes for teaching thinking. Studies and reviews (e.g. Marzano, 1998; Wegerif, 2000; Romney and Samuels, 2001; Trickey and Topping, 2004; Burke and Williams, 2008) have found evidence for the value and effectiveness of teaching and learning thinking skills. The majority of approaches to teaching thinking have concentrated on procedural skills, but these are not the most important. Effective thinking skills programmes encompass a range of broader issues involving techniques, strategies, attitudes, motivations, the formation of self-identity, group enquiry and participation in the classroom, as well as practitioners’ beliefs and the significance of a supportive culture. All of these things are needed in order to develop students’ abilities in thinking (Wegerif, 2002).

Some programmes of thinking skills (e.g. CASE) are constructivist in origin; this means that learning is constructed by the individual through interaction with the environment. So, this will reflect on the learners and encourage them to order their behaviour and develop their thinking to a qualitatively higher level. A significant point is that teaching thinking skills can be used to help to expand learners’ awareness. In this respect, I do agree strongly with a number of scholars (e.g. Wegerif, 2002; Adey et al, 2007) who have argued that these approaches help students to transfer their learning and apply it again in new contexts.

Evidence for the success of programmes to teach thinking skills have been provided by Adey and Shayer, (1993). Their CASE programme succeeded in increasing students’ grades in GCSE examinations. One finding which powerfully supports the argument for teaching thinking skills has been the raising of academic achievement in specific domains resulting from a cognitive
acceleration programme which encouraged the use of bridging, and used formal schemata as frameworks for the progress of activities.

The findings of empirical studies which were mentioned earlier in section 2.3 show positive results with various age groups. These studies present successful evaluations of different programmes and approaches to thinking, and courses for both academic achievement and students’ quality of thinking, that show thinking can be improved by these means, and that thinking skills can be applied and transferred into many other contexts. This claim comes from empirical studies yielding statistically significant results over a range of thinking skills and students’ academic achievement. Students’ general thinking skills and quality of thinking are improved and this develops academic achievement (Trickey and Topping, 2004).

To sum up, in view of the importance and widespread support for the teaching of thinking skills and the actual implementation of education programmes across the world, it is crucial for the educational process to develop individuals with the knowledge and skills to engage in life-long learning. To justify the teaching of thinking skills in a curriculum, it is necessary to first present evidence which shows that thinking skills have great value and that they can be taught; at the same time supporting this claim with different kinds of studies. Addressing all these matters, I conclude that thinking skills should form a major part of the curriculum and that they can be taught. In fact, there have been some criticisms raised regarding the teaching of thinking skills as discussed earlier in this chapter at Section 2.3; addressing these criticisms has led to greater clarity on the nature of thinking skills and to whom they should be taught. The following section shows the role of the sociocultural perspective in informing teaching and learning thinking and its practices.

2.6.2 Sociocultural Perspectives on Thinking

The sociocultural perspective can provide an explanation of the process of teaching and learning thinking skills through participation in sociocultural activities. The sociocultural perspective essentially tries to understand the effectiveness of contexts, tools, actions and the collaborative nature of cognition across historical and cultural epochs. Sociocultural theorists emphasise that cognition is not a personal construction (Wertsch, 1991; Wertsch et al, 1995; Robbins, 2005). The thinking process is very much contextually led through mediated, specific, cultural tools (Robbins, 2005). Therefore, this part discusses three essential elements: teaching and learning thinking may be individual or
social, thinking skills as cultural tools and teaching and learning transferable thinking skills.

2.6.2.1 Teaching and learning thinking may be individual or social

There is a strong integration between the individual and the social. Vygotsky (1978) emphasises the constant movement between social and individual thinking which lead to a new way of thinking about the social context. Thinking skills have, in the past, been seen as the characteristics of individuals, as a property of personal minds; however, in philosophy and psychology there has been a major shift towards considering thought as fundamentally a social not an individual process (Wegerif, 2002). Views such as these also agree with work within the sociocultural perspective, which argues that personal thought, in large part, occurs as a result of the social and historical context. The reviewers of literature on thinking skills have demonstrated that these skills are increasingly rooted in the idea of a social approach. I have already noted several programmes in the instruction process, such as Philosophy for Children, Cognitive Acceleration, and the work of many researchers and specialists such as McGuinness (1999), Lipman, (1991, 1995, 2003); and Wegerif, (2000, 2002, 2007). Furthermore, there is rising agreement that the thinking skills process includes a collaborative aspect in the form of pupil participation in thinking together with others (Rogoff and Toma, 1997). Thus some approaches to teaching thinking which obtained good results used participatory methods, for example The Cognitive Acceleration Programme of Adey and Shayer (1993).

2.6.2.2 Thinking Skills as Cultural Tools

There are two major foci of Vygotsky’s thinking about human mental functioning which are: firstly, the social origins and social nature of individual mental functioning which focus on types of social process; and secondly, Vygotsky’s notion of cultural tools or mediation (Wertsch, 1991). In addition, Wertsch and Tulviste (1992) argued that forms and levels of human mental functioning cannot be seen as general, unchangeable properties of individuals or groups. Rather they are formed by the activity settings in which they are required to function. In light of the great variety of such settings, there will be a great variety of situation specific mental processes.
Thus, I argue that the relation of thinking skills with cultural tools means that thinking is somehow taught or learned via 'tools for thinking' within particular cultural contexts among school subjects. Cultural tools are more than simply signs supporting the development of mental processes, they are also essential to the use of knowledge and perhaps to the creation of new knowledge. The role of cultural tools as 'tools for thinking' is central to the construction of knowledge, and developing the thinking skills of pupils. Cultural tools can be seen as natural incubators which assist in the conscious awareness of teaching and learning thinking skills. Cultural tools are embedded naturally in the thinking of the pupil, among the variety of values and individual experiences which emerge from the textbook exercises. A mixture of cultural tools and thinking skills is evident in many exercises in the KSA textbook as features of mediation can be seen in the example in Appendix 1. These are also processes that require reflection and interaction between cultural tools and thinking skills in the light of the individual's previous and new experience, and his/her feelings which are current, past or perhaps of the future. The socio-cultural perspectives and mediation relate them to thinking skills which make sense of learning so that students become independent learners and build relationships with other learners and teachers as well as other members of society.

In this spirit, Beyer (2008b) explained the relationship between thinking skills and subject matter learning goals as he assumed that thinking skills are cultural tools which serve the aims of learning while subject matter is a vehicle and context for applying these thinking skills. So this relationship provides suitable opportunities for teaching and learning thinking skills, which can be applied in the normal process of subject matter learning. Further detail will be presented in Chapter Three, Section 3.3.

2.6.2.3 Teaching and learning transferable thinking skills

There are different aspects of mediation as a key element of the sociocultural perspective (for more details, see Chapter Three, Section 3.3). An essential aim of independent practice as a function in the sociocultural perspective is to facilitate transfer to other content areas, particularly as the challenges of everyday life normally faced by human beings require us to try to transfer, amalgamate or form a bridge between our previous experience and these new challenges. Consequently, there is the possibility of transferring embedded skills that can be used outside their original context.

Transfer could be definition as "taking something, an idea or skill, that has been learnt in one context and applying it in a different context" (Wegerif, 2002: 37).
Transfer is a more complex issue in thinking skills domains in terms of whether or not knowledge, understanding and skills can be transferred across domains. In fact, there has been a debate about the existence and nature of transferability of thinking skills to other contexts. Thus, I could acknowledge that, in general, it is hard to find clear evidence for the effective teaching of transferable thinking skills in other contexts. However, researchers and practitioners (e.g. Wegerif, 2000, 2002; Romney and Samuels, 2001; Trickey and Topping, 2004; Burke and Williams, 2008) have demonstrated that the findings of these studies confirm that holistic and embedded skills acquired in one context in the instruction process can be applied and transferred into many other contexts, as well as developing investigative skills, the ability to create questions, and self-esteem. Teachers, support their students by explicit links at the beginning and the end of every activity, which aim to make links between what they learn in the class and other, broader, contexts (Wegerif, 2002).

In this connection, Adey et al (2007: 92) claim that there is evidence of transfer from the Cognitive Acceleration, Instrumental Enrichment, and Philosophy for Children programmes, as each programme “clearly stimulates much deeper than domain specific systems, and that ‘something’, we would claim, is general mental ability, or general intelligence”. CASE is one of the most impressive transferable thinking programmes, developed by Adey and Shayer (1993). They found transfer in the linguistic and mathematical-scientific domains in terms of test scores. Teachers applied specific methods where pupils worked in small groups, sharing ideas on specific tasks and making explicit links (bridges) to thinking skills in new learning experiences and new contexts, thereby enhancing their thinking skills and gaining the transfer of their thinking skills to be realized in academic achievement in other subject area contexts.

However, the transfer of thinking skills is not easy or automatic. Research indicates that thinking skills are rarely transferred beyond the context in which they applied at the outset; therefore, instructional support will be needed to assist the learner in making such a transfer (Nickerson, 1989, Beyer, 2008b). In the same respect, Rosenshine (1997:216) emphasised that an important purpose of independent practice is to achieve ‘unitization’ of the strategy, to facilitate students to ‘decontextualize’ a recently learned skill, and extend it automatically to new contexts. Students are enabled to do this if they receive guided practice in the application of skills in different areas of content. Some of these practices are ‘bridging’ processes, employing a similarity of function when a student uses a skill in different situations. Beyer (2008b) proposed a technique for teaching skill transfer that might be utilized even when dealing with a new skill, in which students are helped to preview or review a skill by remembering previous times when they attempted to deal with this particular skill.
Nickerson (1989) raised the debate about whether to teach thinking skills 'content free' or in the context of traditional courses. He argued that in teaching thinking skills it is necessary to make connections or build bridges between these approaches, as he emphasises that teaching will be effective if it combines these two approaches at some level. Nickerson also explained that, in teaching thinking skills, the transfer problem must be addressed in both cases; in the abstract case, the student needs understanding and consciousness of particular aspects of a thinking process; at the same time, they need to demonstrate the applicability of what they have learned and transfer it to other contexts. However, I believe that the infusion approach to thinking skills can be useful and it presents the best opportunity for the learner to apply both these approaches to some degree. In addition, Wegerif (2002) supported this argument for the infusion approach when he emphasised that the consensus of the research evidence is that the infusion approach is the best way to teach thinking skills.

According to the former discussion, the sociocultural perspective's view of learning is a process of appropriating 'tools for thinking', which are offered by social agents who originally act as interpreters and guides in the individual's cultural apprenticeship (Rogoff, 1990). These approaches by teachers help students to transfer their learning and apply it again in new contexts. Throughout the current study there are some clear examples of the translation of thinking skills from textbook exercises into other contexts, as mentioned in Chapter Five, Section: 5.2.5.2. The next section gives details about the major components of thinking skills processes and techniques and strategies for organizing skills.

### 2.6.3 The major components of thinking skills processes

A growing body of research (e.g. Wineburg, 1991; McGregor, 2007; Beyer, 1997, 2008a) argues that teaching the components of thinking skills has to be an important aim of classroom instruction. These components, or procedures, can be taught directly or by an infusion approach in which they are applied to achieve valued classroom learning aims. According to Beyer (2008a), two main types of thinking skills can be identified for classroom instruction: general skills essential for learning, and specific subjects or disciplines which are most useful for particular learning areas such as history or science. In this connection, researchers in cognition have demonstrated, for example, four essential thinking skills for students to become effective learners: comparing, classifying, sequencing, and predicting (Beyer, 1997; Siegler, 1998). Children in the primary
grades who do not master these basic cognitive skills rarely achieve grade level performance as independent learners (Siegler, 1998).

One of the key parts of teaching thinking skills involves instructing students in the unfamiliar skill components and helping them in dealing with the application of these components; effective teaching makes these components explicit, particular, obvious and precise (McGregor, 2007). The literature of thinking shows that the process of thinking has several skill components: (1) one or more of a series of mental steps or cognitive routines or procedures that are executed; (2) general strategies or rules which are often used by experts which guide the application of skills procedures; (3) particular skill-connected awareness about when, why, and how to use that skill (Beyer, 2008a, b).

### 2.6.3.1 Strategies and techniques for organizing skills

A range of mediational pedagogic strategies and techniques can be used to improve the teaching and learning of thinking skills in the classroom without ignoring the 'subject matter' on which the thinking skills are being applied. Strategies such as collaborative learning can demonstrate the impacts of social and cultural context on teachers’ and students’ experience of teaching and learning. Beyer (2008a, b) argued that classroom teachers and students employed certain strategies and techniques consistently and continuously during their thinking skill activities. Students will reasonably expect the type of development in their thinking that will also lead to their better academic success. Beyer (2008b) mentioned that researchers have found that, in any thinking skill, developing proficiency needs more than self-development or indirect teaching and applying thinking skills operations can sharply enhance people’s proficiency through repeated, systematic, direct instruction in thinking skills processes.

Several teaching and learning strategies that may enhance the processes of learning and understanding have been described in the literature. Nickerson (1989: 36) summarized this skill teaching framework as consisting of three stages: modeling, coaching, and fading. In modeling, the teacher shows the student ‘how to perform a task’; in the coaching situation, the student performs the task with help from the teacher; fading refers to ‘the gradual removal of’ support that has been effective to help the student to transfer and control the skills. In the same respect, Beyer (2008a) argued that this framework could possibly be described more strategically through three key stages: introduction which employs modeling an effective technique, guided practice which may be scaffolded and later cued, and transfer to other situations. McGregor, (2007)
identified five generalisable phases in thinking lessons: preparing for thinking, challenging thinking, organizing thinking, reflecting on thinking and transferring thinking.

Interactive pedagogic strategies include principles, criteria, and arguments for organizing and supporting continued skill practice in thinking skills instruction (McGregor, 2007). These strategies can be viewed through a sociocultural perspective. Teaching and learning thinking skills proficiently involves more than a short introduction or quick demonstration in a lesson. In contrast with transmission (traditional) teaching or direct instruction, teaching thinking requires a variety of pedagogic strategies (McGregor, 2007). Researchers have shown that certain features of a range of mediational interactive pedagogy strategies and techniques are particularly effective for skill practice. These include collaborative learning, participation, dialogue, high level questioning, scaffolding instructional support and corrective feedback (Pressley and Harris, 1990; Rosenshine and Meister, 1992; McGregor, 2007; Beyer, 1997, 2008a, b). In this regard, McGregor (2007) emphasised that in developing thinking skills it is not obvious exactly which features of a teacher’s pedagogy, strategies or techniques most powerfully influence the development of students’ thinking.

2.6.3.1.1 Collaborative learning

Interactive collaborative learning for teaching and learning thinking skills is a key feature of successful thoughtful classrooms because it encourages students to engage as a community of learners (Adey, 2006 a; McGregor, 2007). Interactive collaborative learning emphasizes the significance of social interaction in promoting the intellectual development of learners. These strategies support the development of thought using a variety of tactics which encourage more interplay between the teacher and students, who can mutually influence the development of thinking skills. In this regard, a number of researchers (e.g. Adey, 2006 a; McGregor, 2007; Beyer, 2008a) recognize the value of collaborative learning in supporting the development of students’ thinking ability.

Collaborative learning could be described as “a philosophy of interaction and personal lifestyle where individuals are responsible for their actions, including learning, and respect the abilities and contributions of their peers” (Panitz 1996). Dillenbourg (1999) argued that collaborative learning produces interaction patterns which trigger cognitive processes which, in turn, produce cognitive achievement. Some scholars distinguish between collaborative and
cooperative learning with regard to the historical stages of their development and their distinct philosophical roots (Prince, 2004).

Language and talk throughout interactive collaborative learning is used to make students' thinking explicit. Speech as ‘verbal thought’ forms a system of ‘interfunctional relations’ within the active nature of mediation in organizing thinking (Wertsch 1991: 30), as will be discussed in more detail in Chapter Three, Section 3.3.2. Participation in collaborative learning involves a variety of tactics which lead students to communicate and make their thinking explicit. Teachers, in collaborative learning, engage in a unique dynamic by which they mediate their students’ learning process by organising group members, allowing them to evaluate others' ideas and contributions, and generating a learning situation within their cultural context (McGregor, 2007).

The use of collaborative learning has various advantages for promoting students’ thinking ability. These involve "the development of meta-cognitive awareness, in which students learn what they know and do not know, as a result of having to explain their thinking and knowledge to a group" (Burgess and Young, 2005: 70). They identified the following techniques to facilitate student participation in group work, such as:

1. Take time at the beginning of the module to discuss the purpose of the seminars and their relationship to learning; this can help students understand their importance and how they can benefit from active participation.

2. Build strong personal relationships and a sense of belonging through ice-breakers which help students relax and participate without feeling intimidated.

3. Establish shared ground-rules, which may improve attendance, participation and help deal with any later conflicts (ibid: 71).

These techniques seem to act as facilitators to influence the dynamics of interactions between students in cognitive activities which may be reflected in the development of students’ thinking skills in the classroom context. A good relationship and easy communication between teacher and students, or among the students themselves, and giving enough time, seem to be key elements in the development of the thinking skills process, as will be explained more fully in Chapters Five and Eight.

Dynamic interactive dialogue applied between teacher and student, student and student, or teacher and group is another significant mediational strategy
that can be used to 'trigger' students' cognitive abilities whether applied as collaborative learning or used as an independent strategy. Organizing instruction dialogically is 'based on a different kind of relationship between teacher and students, in which students are asked to think, not simply to remember' (Skidmore, 2006: 504). The teacher, in the dialogue process, encourages students to engage as community learners and share their thinking explicitly. Dialogue can be shaped via interaction and participation in social practices within the social and cultural context and in relationship with others.

Furthermore, asking or answering higher-level questions is another strategy that can be used to encourage the greatest opportunities for the growth and development of shared thinking skills. A higher-level question, or 'thoughtful question', is "a question that stimulates or encourages student thinking beyond the level of recall or translation" (Beyer, 1997: 30). In this regard, Beyer also provides several instructional procedures and characteristic of 'thoughtful questioning' that teachers and students might use to teach and learn cognitive strategies. McGregor (2007: 296), for example, listed the following characteristics of questions higher level as:

- Proffered to collaborating groups;
- Being open in nature;
- Having careful progression and sequencing;
- Having differing natures that invite critical, creative and metacognitive thinking.

Thoughtful questions (higher-level questions) allow students to use several cognitive processes in combination with each other, in meaningful tasks, that require them to think deeply, and therefore which motivate students to attempt to respond (Beyer, 1997).

2.6.3.1.2 Scaffolding

Although Vygotsky himself did not mention scaffolding as a term in his work, scaffolding has become widely used in sociocultural theories. Scaffolding is closely related to the zone of proximal development (ZPD) because it refers to the processes that should occur in the ZPD throughout instruction. Vygotsky (1978: 86) defined ZPD as the distance between a child's "actual developmental level as determined by independent problem solving" and the higher level of "potential development as determined through problem solving under adult guidance or in collaboration with more capable peers".
The metaphor of scaffolding was introduced by Bruner (Robson, 2006). The scaffolding concept construes the ZPD as “the distance between engagement and mastery of a task. It informs how to support learners in their learning or problem solving progress … Scaffolding, then, is a way teachers (or more able others) can mediate learning” (McGregor, 2007: 57). Scaffolding is the temporary structures that support students in applying their task which they are not able to do alone. The teacher, in scaffolding, provides a step-by-step structure which bridges the gap between current skills and new skills. The learner gradually takes the teacher’s role and instructs him or herself; learners become more independent by doing such activities as using a diagram, or using a series of written prompts or checklists. Scaffolding thinking consists of supporting pupils’ cognitive development through structuring the thinking skills process with oral and visual prompts (Beyer, 1997).

A number of researchers (e.g. Rosenshine and Meister, 1992; Rosenshine, 1997; Beyer, 1997, 2008a, b) have identified instructional procedures that teachers and students might use to teach and learn cognitive strategies. Rosenshine and Meister (1992), for example, analyse higher level thinking skills, such as procedural checklists and skill instruction, and they find these particularly useful for scaffolding newly introduced thinking skills for both teachers and students. In this connection, these experts emphasise that scaffolds are applicable to the teaching of all kinds of skills, and might be indispensable for teaching and learning higher level cognitive strategies. Beyer (2008b) has summarized the techniques for scaffolding practice of teaching a skill in three stages: a procedural checklist, process-structured questions and continued practice. An essential factor related to scaffolding in the KSA context is the exercises across the textbooks which can be classified as procedural checklists, as well as cueing by pictures or through outlines of subject matter.

Furthermore, cueing skill practice is another important mediational technique that can be used to 'trigger' students' cognitive abilities whether applied as scaffolding or used as an independent technique. A skill practice cue is “a prompt that reminds one of what to do or say next...[that] cueing the application of specific thinking operations assists students in carrying out these operations and moves them toward becoming more independent, autonomous thinkers” (Beyer, 1997: 205). For example, cue cards may be used to help students benefit from occasional hints to recall main words, or what he or she should do next in the thinking skills operation to be applied. Research indicates that a cue is one of the best techniques for supporting students, particularly when it follows scaffolded practice. Cues support students' recall of a skill procedure, resulting from previous learning, followed by scaffolding the application of the skill. Furthermore, there are certain cues which are more effective when teaching thinking e.g. the teacher or instructional materials may
provide cues which include checklists, graphic organizers, names or synonyms of skills which have been previously taught in the classroom (Beyer, 1997; Rosenshine, 1997).

Beyer (2008b) determined four stages in teachers’ and students’ strategies for using scaffolding and cueing techniques: (1) preview or rehearse the skill of thinking, (2) ask students to apply the skill of thinking using a scaffold such as a checklist, graphic organizer, or questions keyed to the skill procedure; (3) ask students to reflect on how they applied the skill of thinking; and (4) then ask students to process the subject matter manipulated and learned by applying the skill of thinking.

2.6.3.1.3 Additional Techniques for Guiding Skill Practice

Rosenshine (1997), Beyer (1997, 2008a, b) and other researchers have reported several other techniques and structures which are especially useful for teaching and learning thinking skills, such as the use of the language of thinking, small steps, or step by step, modelling, and so on. Astington et al (1990) recommend the use of the language of thinking throughout classroom discourse to provide essential cues related to knowledge of thinking. In this regard, Burke and Williams (2008: 105) argue that it is important for learners to be conscious of the use of ‘thinking words’ with their related cognitive skills processes such as “summarise, estimate, conclude, imply”. The importance of children acquiring a specific vocabulary of thinking language is that it will be very beneficial in helping children to understand their own thinking and that of others; as well as using the technical terms that indicate the elements of thinking processes such as ‘alternatives or options’ in exercising choices. Astington (2000) suggested a list of ‘mental verbs’ which, by their use, able the learner to understand thoughts and beliefs. These are categorised as follows:

- Cognition, which includes: think, know, guess, remember, forget, trick, mean
- Desire, which includes: want, need, like, love
- Perception, which includes: look, see, show, watch (ibid: 274).

Providing feedback in teaching thinking skills processes consist of useful instructive feedback through a variety of cues, suggestions, and questions (Beyer, 2008a, b). Feedback and correction may be presented from the teacher and other students in the classroom environment. Teacher feedback may occur through guided practice as students attempt to develop thinking skills; while group feedback occurs when there is feedback between students in which they pose questions and compare answers (Rosenshine, 1997). To be most effective,
Beyer (2008a, b) emphasised that feedback must follow up student application of the skill. Feedback can be provided immediately after applying thinking skills, and carried forward into the new task by using various techniques for guiding skill practice, such as scaffolding and cueing devices.

### 2.6.3.1.4 Giving enough time

Developmental processes, products of experience and repetition are essential elements in a cumulative teaching and learning operation which require time. Beyer (2008b) emphasised that thinking skills rarely improve simply as the outcome of experience or maturity alone, particularly throughout the early years. It does not normally happen simply as an occasional effect of classroom learning of subject matter, rather, thinking improves over time by the cumulative experience of operations by instruction (Nickerson, 1989; Beyer, 2008b).

Time is a significant aspect of developing thinking skills instruction. The experts seem unsure as to how much time should be devoted to the thinking skills process (Cotton, 1991). However, a number of studies (e.g. Al-Qahtani, 1995; Collinson and Cook, 2001; Rodrigues, 2005; Jones, 2008) show that time for thinking skills has beneficial effects for the learner. In this regard, Rodrigues (2005) emphasised that teachers often complain that they don't have enough time to better deal with issues such as promoting individual learning, adding flexibility in teachers' schedules and responsibility in schools, or doing research. The dynamic interaction of elements in schools, such as flexibility in teachers' schedules and organizational learning, can intensify awareness of how best to deal with the time factor (ibid).

In this connection, Beyer (2008b) emphasised that there are few, if any, situations where proficiency in thinking skills is the outcome of a single experience. For thinking skills to develop, continued instruction and practice are required. In this regard, Beyer (2008b) argued that research shows that some beginners need as few situations as five or six for learning experiences to promote their levels of autonomous thinking, while others may need many repeated situations, up to fifty or more experiences to do so.

Giving enough time allows students to modify their thinking processes based on their experiences through practice. Becoming more expert in applying thinking skills requires continuous practice over a drawn-out period of time in different subject matters and contexts (Beyer, 2008b).
2.6.3.2 Training teachers

Teachers are particularly important in developing thinking skills, as it can be argued that the teaching of thinking is a very special case of teaching which requires special professional pedagogic skills. Adey (2006a: 49) emphasised that teaching for the development of students’ thinking skills is ‘not a straightforward matter’. It requires different types of pedagogic skills, which differ from the normal quality of pedagogy, in order to develop students’ thinking. Teachers can influence their students’ thinking by a variety of means and pedagogical strategies, presenting cognitive activities with outcomes in mind that can support progress in ways of thinking and foster cognitive skills (McGregor, 2007). Thus, a number of authors (e.g. Cotton, 1991; Jerwan, 1999; Qatami, 2004; Rodrigues, 2005; Adey, 2006a) stress the importance of training teachers to teach thinking skills, believing that this will be reflected in student achievement.

Training teachers may be as significant as the programme itself, so when teachers teach thinking explicitly, their understanding of the classification of cognitive processes and the related habits of mind are as important as employing appropriate teaching techniques such as thinking maps and diagrams. Numerous teaching practices are effective in promoting the development of thinking skills, such as: asking higher-order questions which help promote and develop a variety of higher order thinking skills; asking for analysis, synthesis, or evaluation; lengthening wait-time by giving a student enough time to respond to a question; redirection, probing and reinforcement (Cotton, 1991).

Professional development for teachers of thinking skills via continuing professional development (CPD) or in-service training is the most important element in developing teachers’ knowledge of teaching thinking skills, as the present study will show. Thus teachers must develop their ability by particular training that requires adaptation for different groups of learners, as well as sufficient appropriate equipment. This training should continue throughout a teacher’s service. It is essential to encourage teachers to professionalize themselves as persons as well as becoming responsible, self-accountable professionals. Additionally, training requires a serious commitment from the government which is responsible for providing the best possible instruction process (Rodrigues, 2005).
2.6.3.3 Classroom environment

According to Beyer (1997), an exemplary classroom environment for teaching and learning thinking skills is one that can improve the quality of student thinking; classrooms such as these should involve at least four things: (1) a classroom friendly learning environment in order to support students; (2) building thinking processes visibly and explicitly; (3) using appropriate techniques and strategies for teaching and learning thinking such as scaffolding and cueing techniques; (4) integrating and continuing systematic instruction with subject-matter learning, particularly involving complex cognitive operations.

A safe environment in the classroom is one of the most prominent elements allowing for the development of students’ thinking skills. ‘Safe’ here means giving students freedom of expression to talk and ask questions while minimizing the negative aspects of ‘power relations’ as well as fostering equality between students in order to build their capacity for thinking in the classroom. The safe environment gains importance in light of the existence of power relations in the classrooms; power relations will be discussed more fully in many parts in the present study (e.g. Chapter Eight, Section 8.2.2). In this regard, Burgess and Irving (2005: 25) emphasise that "students need to learn in ways that develop their self-confidence and self-esteem, and encourage them to take risks in safe environments”.

Moreover, Thacker (cited in Cotton, 1991) suggests the following conditions for fostering an environment helpful to the development of thinking skills:

- Setting ground rules well in advance;
- Providing well-planned activities;
- Showing respect for each student;
- Providing nonthreatening activities;
- Being flexible;
- Accepting individual differences;
- Exhibiting a positive attitude;
- Modeling thinking skills;
- Acknowledging every response;
- Allowing students to be active participants;
- Creating experiences that will ensure success at least part of the time for each student;
- Using a wide variety of teaching modalities.
In the following section, beliefs as factors in the teaching and learning of thinking skills will be discussed.

2.7 Beliefs: Regarding the teaching and learning of thinking skills

In order to understand the dynamics of executing a thinking skills process, two aspects of the thinking skills process need to be taken into account. First, the perspective of the individual teacher’s particular beliefs and convictions as they implement thinking skills programmes. Second, the perspective of the organization as an instrumental context for the implementation of thinking skills programmes. The combination of individual beliefs and organizational issues present a broad picture of real factors which have a strong influence on the thinking skills process. In addition, both are inherent to the implementation of a comprehensive thinking skills programme. Thus, I believe that it is important to avoid focusing on the overt factors that seem to affect the implementation of a thinking skills programme without addressing the hidden aspects of teacher beliefs and organisational issues that have a strong influence on the practical aspects of the teaching and learning of thinking. This view comes from the previously illustrated idea which is that teachers’ behaviour is strongly affected by their individual belief systems.

2.7.1 Beliefs, Nature and Definition

There have been different attempts to identify the concept of belief via a multi-dimensional classification (e.g. Dewey, 1938; Wehling and Charter, 1969; Rokeach, 1968). However, regardless of the particular position of this classification, the important characteristic of belief is that internal truths exist beyond personal behaviour or effectiveness and these internal truths will be reflected in the teacher’s behaviour regardless of the situation (Pajares, 1992). Another significant characteristic is the distinction between beliefs and knowledge. Pajares (1992) argues that beliefs are ‘static’ since beliefs represent internal truths and also that beliefs have an emotional aspect that dictates the rightness or wrongness of a person’s actions. Knowledge, on the other hand, often changes and it improves as new experiences are integrated into new plans; also knowledge is emotionally neutral. Additionally, knowledge can be evaluated or judged, while there is a lack of consensus about how beliefs can be evaluated (Mansour, 2008a). The study by Mansour (2008a) shows there is an interactive relationship between knowledge and beliefs. Furthermore, I concur
with Mansour (2008a) that a better understanding can be had by discovering the relationship between them, and, to assume that beliefs shape knowledge.

A further study by Mansour (2009) outlines certain characteristics of the nature of beliefs that can take place in a given instructional perspective with regard to personal religious beliefs and experiences. Teachers hold beliefs about themselves as well as about their students, the nature of the discipline they teach, the social context, the environment of their school and the barriers they have to deal with. Religious belief is an important aspect because it is associated with a rich store of knowledge which is reflected in teachers’ interactive thoughts and their planning for thinking skills learning which occurs in classrooms. In the same respect, Mansour (2008a), from his research in Egypt as a country of similar background to the KSA, found personal religious experience to be the most powerful element characterising the nature of belief, which has the most influential influence on behaviours in the classroom.

I concur with Mansour (2010) that most studies of thought in general have been carried out in Western cultures, not in Islamic culture, so, in this different context the view of the relationship between thought and religion may be confused and conflicting. Studies of thought in general have ignored this relationship. These reasons may shed light on the way studies of thought in general do not discuss the effects of belief on teaching and learning thinking. Thus, to complete an understanding of the factors influencing thinking skills, particularly in the social context of the current study, religion is the most powerful factor in the belief system, not only for many essential sections of the KSA instruction system, but also in every facet of life in the KSA.

The debate about Islam and thought extends to a debate about the relationship between Islam and the intellectual domain; particularly foundations of the Islamic thought view of epistemology. In Islamic epistemology, the essential debate concerns the question: What are the sources from which knowledge is derived? Then, how is it to be understood and explained? There are two key views for where knowledge is derived. The first school argues that knowledge is derived from revelation, a ‘religious source.’ This school argues that knowledge derives from the activity of the human intellect, through science and reason. At the same time, this school stresses that there is no conflict between religion and reason at all, as some believe, and if someone assumes that there is opposition between them the dominance will be for religious views or evidence of transmission from a dependable source, namely the holy Quran and Sunnah (in which Mohammed (peace be upon him) said his words of wisdom), over reason. The majority of Islamic scholars such as Al-Ghazali, Ibn Taymiyah and Ibn Al-Qayyim are consistent with this view.
A number of intellectual developments which occurred in the Islamic world, such as the translation of many Greek classics into Arabic at the end of the second Islamic century, resulted in the emergence of a second school which believes that there is equality between reason and revelation evidence and sources, or even supremacy of reason over revelation in some areas of knowledge or morality. The religious element is seen as an essential element of access to knowledge. This view was held by philosophers such as Al-Kindi, Al-Farabi Al-Razi, and Ibn Sina.

Islam strongly encourages thought and urges its followers to work on their minds all their lives. However, as will be discussed in the findings of this study, there are a few situations, particularly in the field of theology and the jurisprudence of Islamic law, which are difficult to interpret or to reason out. Consequently, religious scholars tend to stop using reason about why these rules became this way or this shape, particularly with primary school children. Dealing with such situations as these may be sensitive for some teachers, especially in light of questions to which the teacher may not know the answer, so they may avoid entering into these issues in depth. Furthermore, these issues may have negative connotations for teachers to use for the development of thinking skills, as some teachers believe that they will generate questions that they would prefer to avoid or which need not be raised by the students.

Belief is one of the most difficult concepts to define because a ‘belief’ is a global construct that cannot explicate itself by empirical investigation (Pajares, 1992). In this connection, Pajares (1992) notes that some theorists think that ‘belief’ cannot be clearly defined and that beliefs are usually seen as the more appropriate function of philosophy or religion. However, I concur with Pajares (1992) when he emphasises that beliefs can be the subject of legitimate inquiry in such varied fields as anthropology, sociology and psychology as well as philosophy or religion.

Harvey (1986 cited in Rodrigues, 2005) described belief systems as "a series of conceptual representations, with particular meanings to its holder, which synthesizes a reality or circumstances of 'sufficient validity, truth and/or trustworthiness to warrant reliance upon it as a guide to personal thought and action" (p. 660). The concept of belief used for the present study is a personal concept of thought, which is often conscious of the influence of religion, culture and experience that can affect many aspects of the instruction process, as well as contributing to the implementation of improvement in the classroom. In fact, there are many aspects and characteristics of beliefs that will be discussed in the following section.
A variety of factors influence the beliefs and conventions of teachers and learners, including experiences, culture and events as well as individual factors. Obviously, experience plays an essential role in influencing teachers’ beliefs about the teaching and learning processes. Such experience may be of two types: formal experience, education and training courses, and informal experience including day-to-day contacts (Mansour, 2008b). In addition, enculturation also plays a crucial role in shaping teachers’ and learners’ beliefs. Pajares (1992) argues that beliefs are shaped through a process of early enculturation and social construction that involve incidental learning processes which people assimilate during their lives along with other cultural features. Mansour (2009: 37) summarized belief systems and sources as he emphasises that beliefs "tend to blend into one system and that system is used holistically as an interpretative frame; various sources of teachers’ beliefs are still recognizable". Furthermore, he found that teachers’ individual religious beliefs work as a ‘schema’ which has strong effects on the teaching and learning process when translated into teacher practices in the classroom. Also, he distinguishes between teachers with religious beliefs and teachers without such religious schemas.

2.7.2 Beliefs and Practices

Beliefs have significant consequences for effectiveness in many aspects of daily life. It is frequently asserted that teachers’ beliefs are reflected in their classroom practices (Rodrigues, 2005). Beliefs become effective personal characteristics and play a major role in guiding teachers’ practices in their classrooms, by formulating and organizing their knowledge of pedagogy (Mansour, 2008a, 2009). Beliefs shape understanding of the thinking skills process and how teachers and pupils conceptualise thinking skills. In addition belief systems are reflected in the acquisition and interpretation of knowledge, ways of understanding, practices and decision-making for both teachers and students in the instruction process. This is significant for the understanding of factors which influence, and challenge the development of, thinking skills via teachers’ and students’ practices and the implementation of comprehensive thinking skills programmes in the classroom.

Pintrich (1990) suggests that beliefs and knowledge influence a wide range of cognitive operations including remembering, understanding, assumption and induction, and problem solution representation. Also, as many theorists (e.g. Pintrich, 1990; Pajares, 1992; Mansour, 2008a, 2009, 2010) argue, beliefs influence teachers’ and students’ thinking, as well as having a strong influence
both outside and inside the classroom. Consequently, beliefs have been described as one of the most valuable psychological constructs of student thought processes. "Studies on attribution beliefs and locus of control are also prominent in investigations of student thought processes" (Pajares, 1992: 308).

It has been acknowledged that the environment of instruction has a significant influence on practices in the classroom. However, this should be taken as a whole, together with an understanding of beliefs and the way they are played out in practices in the environment of instruction. Beliefs should be studied within a framework which recognizes the effect of culture, showing awareness of the role of sociocultural context on the formation of beliefs and practices. Consequently, most of the research (e.g. Pajares, 1992; Maxion, 1996; Mansour, 2008a, 2009) argues that beliefs and practices depend on the context; they cannot be examined out of context. Therefore these studies suggest that a better understanding of belief systems should be examined within a framework that is conscious of the influence of culture. These studies also show that the relationship between beliefs and practices is a complex one. Therefore, it is essential to take into account related elements that shape some of the nature of beliefs. In this regard, Pajares (1992: 26) emphasises that considering educational beliefs as separate from and unconnected to a wider belief system is mistaken. As a result, researchers must study the context-specific features of beliefs and should highlight the nature of the linkage with underlying factors, contextual issues and belief systems.

The interaction between experiences and religion is another significant factor in the complete understanding of the relationship between beliefs and practices. Such experiences and personal religious beliefs can play a major part in teachers’ and learners’ identities, which in turn influence their practices and orientations in the classroom. Since experiences change day by day, so will beliefs and practices also change; thus it is imperative to examine the nature and effects of this change on the teaching and learning process (Mansour, 2009).

Beliefs are influenced by interaction within social contexts which in turn affects beliefs about the teaching and learning of thinking skills. This view permitted a better grasp of teachers’ understanding of their work, which will make clear how the meaning of teachers’ practices affects their convictions and decisions about teaching and learning thinking skills, about gaining new skills, or interpreting these skills, and that this, in turn, influences pedagogical practices in the classroom. In the following section, the existence of teaching and learning of thinking skills in the KSA will be discussed.
2.8 Teaching and learning thinking skills in the KSA

In this section, the background to the context of the study will be presented, offering a brief overview of teaching thinking in the KSA. This section considers the efforts of the MOE in the KSA to improve the status of thinking skills.

The development of children’s thinking skills in primary schools is still hardly a reality in the KSA which, in general, depends on instruction for memorisation. However, since 2002, a number of projects have been developed in order to establish new educational approaches that may improve the quality of education provided in KSA schools such as King Abdullah Bin Abdulaziz Public Education Development Project and, in particular, the Tatweer Project which aimed to improve and develop curricula (Project duration is six years, 2007 - 2013). More details were mentioned earlier in Chapter One, in Section 1.5.3. Unlike in the UK, the current situation in the KSA shows that there are no major projects related to the teaching and learning of thinking skills in schools in the KSA, equivalent to programmes such as Philosophy for Children or Thinking Together. However, a number of factors and recommendations are contributing to radical changes in most curriculum areas in the KSA.

The MOE in the KSA has worked hard to implement its policy of teaching thinking skills in the curriculum. The Directorate of Curriculum, in the MOE, which undertakes curriculum design and development, has made some changes in its policy and introduced the teaching of thinking skills in the primary education curriculum such as Islamic, science and mathematic education as well as at other levels of the system. Consequently, the MOE has expended tremendous efforts to improve the status of thinking skills. To do this, thinking skills have been integrated with curriculum content since 2007 in most curricula in the KSA. The main aims of these efforts, I believe, are to create models of pedagogic intervention in the varied curriculum areas which will develop new knowledge, skills (including thinking skills), ideas, values and preferences which should improve individual and group experiences across the curriculum, providing learners with strategies to improve their cognitive abilities together with citizenship.

There has been a growing debate about the mismatch between inputs and outputs in the KSA education because the outputs of educational reform have been disappointing. Educational reform is still stalled in its progress towards building the good citizen through the development of thinking and attention to nutrition (Al-sughayer, 2007). A second is internal pressure, for enhanced social mobility coming from the considerably increased numbers of concerned intellectuals, experts and parents. This is leading to the need to apply a
modernizing approach to such systems, so that the newly emerging generation is able to adapt to the challenges and demands of the new global social order.

Thirdly, adoption of the infusion approach to thinking skills in school textbooks, as one of the appropriate modes of educational reform, will be reflected in the continued development of thinking instruction and the development of the capabilities of students. This will eventually be reflected in their future society, as the transition is made from the traditional education method based on rote memorization towards emphasis on the use of knowledge (Teacher’s guide for the development of thinking skills, 2004).

I believe that the MOE is seeking to encourage teaching and learning thinking naturally in schools by introducing the teaching and learning of thinking skills. The MOE may assume that such teaching and learning thinking skills is important in order to prepare pupils for their future and for the challenges facing the nation in the future. Developing a range of thinking skills at an early age would enable pupils to apply ideas and transfer them to new contexts, and this would eventually reflect on their society and work. Hence, the MOE hopes that teaching and learning thinking skills in school will not just be for academic purposes but that it will prepare pupils for their adult life in the twenty-first century. This requires education to be more than just memorising and/or transferring the heritage but also about creating a successful life.

From my own student experience and from being a teacher for nearly two years in general education I agree with a number of authors (e.g. Jerwan 1999; Al-Ghamdi and Abduljawad, 2002; Qatami, 2004) that educational development has been focused on the growth and expansion of educational opportunities and the provision of opportunities for community members to attend any educational institution. However, this attention and spread of educational opportunities has not been accompanied by the development of the educational process in the classroom. Consequently, some of the prevailing attitudes in schools may not fit with the teaching of thinking skills. Some of these negative attitudes, whereby teachers assume themselves to have the right to act according to their status, give teachers a monopoly of classroom time and they often do not give their students enough time in lessons to develop their ability of thinking. This method of teaching conflicts with the general characteristics of teaching thinking skills, as I will discuss later.

Additionally, most teachers deal with only the basic thinking skills or cognitive thinking skills of their students, so, they teach the textbook as absolute facts which are non-negotiable. This perhaps helps to explain why some teachers who participated in the current study possessed explicit knowledge about the existence of thinking skills interventions, while not having a minimum amount
of information and skill regarding the teaching of thinking skills and its implementation in KSA schools, as will be seen in Chapter Six. In the following section, challenges to the teaching and learning of thinking skills in the KSA will be discussed.

2.9 Challenges to the teaching and learning of thinking skills

The previous section discussed teaching and learning thinking skills and involved answering the key question that emerges from this literature, which is: Can thinking skills be taught? This was followed by a discussion of the roots of teaching and learning thinking in the sociocultural perspective, and a description of the major components as essential factors of thinking skills processes and techniques and strategies for organizing skills. In this section, I will discuss challenges to the teaching and learning of thinking skills, in order to better understand the dynamics of executing a thinking skills process.

The role of contextual constraints or challenges on the instruction process may not appear in many educational research accounts; however, it is sensed by teachers and learners in their daily contacts and experience (Gahin, 2001; Mansour, 2007). A growing body of research (e.g. Jones, 2008; Mansour, 2008b) argues that a full understanding of the teaching and learning process is conditional upon an in-depth understanding of the challenges and opportunities that exert an effect on the teaching and learning process.

Disagreements over the nature of thinking constitute another aspect of the perception of challenges (Lipman, 2003). Since thinking is a complex phenomenon, this may negatively affect the teaching and learning of thinking skills in the classroom, as teachers may not have clear views about what exactly they should be teaching, particularly in light of teachers’ limited preparation and training. Similarly, Beyer (1984, in French and Rhoder, 1992) supports this view when he identifies five major challenges to developing the teaching of thinking skills. One of them is the lack of “consensus regarding what constitutes thinking skills, and vagueness in defining them” (p.485). As a result, “education today continues to exhibit both haziness and great diversity” (p.485) in what is taught. In addition, all thinking skills, regardless of complexity or significance, are given the same weight and time in the curriculum”(ibid: 246). This point was noted in the current study where, in discussion with some of the teachers, I noted their lack of a clear vision of thinking skills and how to deal with them, as discussed in Chapter Six.
Another aspect of the perceived challenges is teachers’ feelings of frustration which reflect negatively on the thinking skills process. From his reading, analysis and interpretation of the relevant research, Cornbleth (2001: 76) delineated five constraints discouraging teaching thinking, one of which he characterised as relating to challenges. This is ‘a climate of perceived pupil pathologies and pedagogical pessimism’. Challenges such as this may reflect negatively on teaching and learning thinking skills processes, through a low level of planning, for example. There may also be a negative reflection on the process of thinking instruction and the development of the capabilities of students in light of the erosion of the optimism of the teacher. Furthermore, there may be a lack of continuing follow-up to identify the real level of performance of the students. Finally, reflecting pessimistically on pedagogical issues may result in limiting the effects of strategy and techniques of teaching thinking, possibly leading to dependence on traditional methods and teachers’ literal adherence to textbooks.

Teachers and students alone cannot be responsible for the quality of classroom practices. External contextual factors can also constitute a barrier for the teaching and learning of thinking skills. Some of these challenges relate to other aspects of the educational process while some are more especially relevant to the thinking process. Therefore, growing bodies of researchers in different fields (e.g. Al-Ghamdi, 1995; Gahin, 2001; Al-Mazro, 2001; Al-Shimmari, 2007) have identified common challenges, or ‘constraints’, that influence teachers’ performance in the classroom. There is more than one challenge which constrains the teaching and learning of thinking skills. These challenges profoundly shape teachers’ choices and decisions. These include a number of challenges which have serious effects on the teaching and learning process, for example: pupil misbehaviour, time/resource difficulties, professional recognition needs and poor relationships (Borg et al, 1991). Kelly and Berthelsen (1995) identified sources of constraints for groups of teachers which were: time pressures, children’s needs, dealing with non-teaching tasks, meeting personal needs, meeting parents, maintaining the classroom.

Cornbleth’s (2001) previously mentioned five constraints discouraging teaching for higher order thinking are:

1. A bureaucratic environment with an emphasis on law;
2. A conservative environment with an emphasis on maintaining the status quo;
3. A climate of challenges that threaten the external curricula.
4. A climate of pathology which views students with pedagogical pessimism;
5. A competitive environment dominated by testing students.
The significance of this finding is supported by Rodrigues (2005), Al-Shimmari (2007) and Blasé (1986 cited in Mansour, 2008a) who also emphasized that time was one of the most important constraints. In the same respect, Goelz (2004) mentioned that a bureaucratic school climate with an administrative emphasis on maintaining a strict schedule does not allow for creative methods of teaching, particularly where these methods require student-generated learning, discussion and reflection. Goelz (2004) and Al-Shimmari (2007) mentioned that the constraint of class size was an essential element having a negative impact on non-traditional teaching methods. Lowering class sizes in classrooms would help the teachers to incorporate a diversity of teaching methods since the teacher would be able to have a closer instructive relationship with each student (Goelz, 2004).

A number of studies show that a lack of time is a main obstacle to changing the instruction process. In the same respect, Beyer (1984, in French and Rhoder, 1992) support this view when he identifies five major challenges to developing the teaching of thinking skills. One of them is that students may have to master too many skills in too little time. Therefore, pupils need time to succeed in the infusion curricula.

Teachers often complain that 'they don’t have enough time' to deal with issues such as promoting individual learning, adding flexibility or responsibility in schools, or doing research. The dynamic interaction of elements that encourage or obstruct teachers’ learning can intensify awareness of how best to deal with the time factor (Rodrigues, 2005). These issues may intensify when the infusion approach is adopted, in that teachers will have the double responsibility of teaching the original content of the subject in addition to teaching thinking skills in the same lesson and at the same time. As a result some educators are opposed to teaching thinking skills, on the pretext that time was allotted for the original subject not for teaching thinking skills within the subject.

Educational policy, administrative demands, supervisors and school curriculum requirements are essential external factors affecting teachers' and learners' thinking. A bureaucratic climate with an administrative emphasis on law is a primary obstacle to the meaningful teaching and learning of thinking in that it may have negative impacts on both teaching for meaningful learning and also that this kind of administration inhibits the sort of critical thinking that incorporates diverse perspectives. Instead, administrators should give teachers and students more support, more freedom and more flexibility, conducive to creating the optimum environment for teaching and learning thinking, as well as giving children a positive experience of school which may be manifested as a positive attitude towards the subject of thinking in the classroom.
Another important aspect of characteristics of models and programmes of thinking skills is classroom environment. The literature shows the importance of positive classroom climates in all learning processes, especially for thinking skills. Staff of schools, particularly teachers and administrators, should have the general culture of thinking skills and should assess how this culture affects their ability to support thinking skills habits among their students (Orr and Klein, 1991). Overall, the basic aim is not only limited to this skill, but beyond that, to the setting in which it is found, to consist of thinking curricula, thinking classrooms and thinking schools (McGuinness, 1999).

The classroom environment, characterized by warm relationships, teacher encouragement and a pleasant physical environment, has an impact on all types of learning (Cotton, 1991). One of the essential elements in learning thinking skills is that students must feel safe when they are thinking and learning, so that teachers may have to reduce what is known as the 'power relation' which comes from the teacher's authority. In this connection, a recent study by Eteläpelto and Lahti (2008) focused on five different learning situations over a two year period, aiming to identify the challenges to creative collaboration by using rich emotional scaffolding between the students and tutors. The key challenges to creative collaboration were connected to the emotional climates and power relations between elements of the group. Other challenges concerned the difficulty of the knowledge included in the topic and a lack of competence within the group.

School textbooks are clearly the main educational source for both teachers and learners of thinking skills in the classroom, particularly in the KSA. Education policy in the KSA supports the status of the school textbook by considering it to be the main source of information, in which all units must be completed. Therefore, teachers, students and administrative staff are all concerned with the completion of all units of the textbook, regardless of how it is covered. In many cases, the basics of the instruction process, such as the ideas and participation of students and their understanding of the book’s contents, are ignored. There is a need to discover the social construction of school textbooks, by analysing and critiquing the books, as well as the inputs of the many people who deal with them during the educational process, such as the writers and editors, plus the teachers and students who struggle to build meaning from the text (Mansour, 2008a). Thus, errors dealing with textbooks by many different parties in the educational process may distort many of the goals for which these books were designed, including the teaching of thinking skills.
2.10 Overview of the literature and the questions the present study will address.

Today’s rapidly changing world has shifted from an industrial mode of society to a learning society (Cotton, 1991; Qatami, 2004; Adey et al., 2007). These have led to the pressing need for changes within our educational system, in order to produce citizens who can function in the modern world, to develop school-leavers’ ability to identify coherent alternatives, and to look for evidence and reasons for their beliefs, both in themselves and in the social context. Accordingly, this has shifted the role for education, which now lies not only in the acquisition of knowledge but in acquiring, strengthening and improving the skills of thinking. Thus, learning to think is one of the most important goals of formal schooling.

To meet that goal, thinking skills constitute an essential part of a movement in education striving to address these problems, through helping students improve their cognitive abilities. Taggart et al (2005: VI) suggest that thinking skills should be expected at all key stages and focus on ‘information-processing skills, reasoning skills, enquiry skills, creative thinking skills and evaluation skills’. This literature review provided a contribution to understanding the thinking skills perspectives, including definitions, significance, frameworks, models and programmes of thinking skills, as well as looking at gaps between theory and practice, particularly in the KSA. It also identified the instructional elements that have been used to teach and learn thinking skills in a specific social studies context. The reviewed literature identified the appropriate theoretical framework to develop these thinking skills through different pedagogic strategies which involve interacting with others, and to explore the challenges that face thinking skills instruction. Based on all of the above, the reviewed literature has assisted in formulating the research questions for this study as:

1) **What are the experiences of male teachers and 10-12 year-old students of teaching and learning thinking skills in the KSA primary curriculum?**

2) **What factors appear to guide teachers’ and students’ experiences of thinking skills?**

3) **What are the main perceived challenges facing teachers and students when they are teaching/learning thinking skills?**

Based on the literature review, the main distinction between this study and previous literature is that this study takes into account certain aspects of the development of thinking skills in an educational system: curricula, and
teachers’ and students’ experience within a dynamic interaction of social and cultural context. It seeks to explore how the interacting partnership between teachers and students helped to create successful dynamic teaching and learning of thinking skills in the classroom in the KSA context.

The next chapter will describe the methodology used in this study, including the methods of data collection and analysis, in order to address the research questions.
Chapter Three

Research Methodology
3.1. Introduction

This chapter explains the plan of the study, including the research aims, and questions addressed. The different research paradigms are discussed, followed by a justification of the paradigm considered appropriate for this study. In addition, it discusses the sampling approach, planned data collection methods and stages, ethical considerations and the limitations of each phase of the study. Finally, it offers an explanation of trustworthiness as a quality of the research.

To confirm, the main aims of this study are to explore teachers’ and students’ perspectives on and current approaches to the teaching and learning of thinking skills in the KSA primary curriculum; to investigate the impact of the factors which appear to guide teachers’ and students’ experiences of thinking skills in the classroom; and to identify possible challenges that would face both teachers and students in developing these skills.

Therefore the research questions under investigation in this study are as follows:

1) What are the experiences of male teachers and 10-12 year-old students of teaching and learning thinking skills in the KSA primary curriculum?
2) What factors appear to guide teachers’ and students’ experiences of thinking skills?
3) What are the main perceived challenges facing teachers and students when they are teaching/learning thinking skills?

3.2. Research paradigm

In modern research, operating through a specific paradigm has become essential in the context of education research. The term ‘paradigm’ was introduced into research following the work of Thomas Kuhn (1922-62) (Wellington, 2000). According to Guba (1990: 17), a paradigm can be defined as ‘a basic set of beliefs that guide action’. Working through a specific paradigm is influenced by the researcher’s view of the world and of the nature of truth; it helps to guide the researcher in selecting and managing his/her methods of looking into the research area, and in drawing conclusions from the data.

In the literature, three main research paradigms are described, namely: the scientific paradigm, the interpretive paradigm and the critical paradigm. The interests of the scientific paradigm lie in producing general laws; those of the
interpretive paradigm lie in understanding and interpreting society (Wellington, 2000; Pring, 2004; Crotty, 2003); while the interests of the critical paradigm rest on underlying critical theory and involve ideological positions on basic social conditions (Cohen et al, 2000).

The scientific (positivist) paradigm was introduced by Auguste Comte (1798-1857), a French philosopher who developed positivism within sociology (Crotty, 2003). According to positivists’ realist views, ‘the world exists independently of our knowledge of it’ (Grix, 2004: 80). Therefore, positivist explanations of the real world must be based on empirical evidence and the assumption that every event has a cause. Comte claimed that knowledge was solely based on 'sense experience' by experiment and observation (Cohen et al, 2000). The main purpose of the positivist paradigm is to seek out, then generalize, findings (Wellington, 2000). Three positivist assumptions about human behaviour are that human behaviour is predictable, that aspects of human behaviour can be observed and measured, and that there is similarity between the natural world and the social (Mansour, 2008a). So, because the scientific paradigm is derived from the natural sciences, it assumes that there are general laws or rules in human life; this assumption in itself is a source of criticism of this paradigm (Cohen et al, 2000).

By contrast, the interpretive (constructivist, naturalistic) paradigm seeks to understand and construct meanings in social situations via the views of the people who are describing and interpreting the phenomena under study; so, reality is constructed, multiple and complex (Wellington, 2000; Cohen et al, 2000). In the interpretive paradigm, the existence of general laws in human life is not a fundamental assumption as is the case in the scientific paradigm. The interpretive paradigm can be applied to the study of social actions or of documents by the use of various qualitative methods rather than quantitative methods; in addition, this paradigm emphasises the researcher as a primary data gathering instrument (Wellington, 2000). A weakness of this paradigm is the likely subjectivity of the enquiry and its results.

The critical paradigm is the third main paradigm. It is based on the critical analysis of social and cultural phenomena, in terms of power differences between social groups and the conflicts of interest between them. The purpose of research in the critical paradigm is to change social behaviour rather than just to understand it, aiming to realize a society based on equality for all its members (Cohen et al, 2000). Because the critical paradigm considers the ideologies held by members of society, it assumes the researcher to be ideologically neutral; this assumption in itself is a source of criticism of this paradigm, as the researcher may not have a disinterested political agenda (ibid).
The question arises, then, as to which is the most viable approach, the scientific paradigm, the interpretive paradigm or the critical paradigm? This study aims to describe, understand and interpret the meaningful perspectives on the phenomenon of thinking skills within the KSA social context. This study does not aim to generalize its findings to other contexts of educational research; rather it aims to illuminate and try to understand the phenomena under study within the KSA social context. In addition, a part of the study explores teachers’ and students’ beliefs. Some authors (e.g. Nespor, 1987; Gahin, 2001) claim that teacher belief studies should be interpretative. Furthermore, this study draws on a sociocultural perspective in which there are important elements, such as understanding actual situations, social realities, identities and multiple interpretations of reality of participants within the culture and history of the KSA. In particular, understanding the way social factors interact is a significant element which requires participants to be able to discuss their life-experiences. These are a function of human perception and as such cannot be described as ‘objective reality’, or fully explained by scientifically established laws of nature using scientific experiments as in the positivist paradigm.

Therefore, this study uses the interpretive paradigm. This requires the researcher to be fully involved in the situation of the study in order to interpret each participant’s experience and therefore gain an understanding of the teaching and learning thinking skills process from the point of view of the teachers and their students. The interpretive researcher aims to elucidate shared meanings and gain insights into situations by exploring participants’ different perspectives on their socially constructed realities (Wellington, 2000). To do this, working within the interpretive paradigm allows me to adopt a varied and efficient methodology through which I can explore multiple interpretations and multiple experiences of teaching and learning thinking skills. This contrasts with use of the scientific paradigm with its quantitative statistical procedures and data.

To sum up, for all these reasons I believe that this study fits best within the interpretive paradigm and that this is the best way to fulfil its aims.

Based on these assumptions, the next section will discuss some ontological and epistemological issues associated with the interpretive perspective that affected the design and execution of the study.

Research paradigms are characterized by three components: ontology, the study of being; epistemology, the associated view of knowledge; and methodology, the processes used in the study (Crotty, 2003).
3.2.1. Ontological assumptions

Ontology, the knowledge or study of being "is concerned with 'what is', with the nature of existence, with the structure of reality as such" (Crotty, 2003: 10). The two extreme views on ontology are realism which is driven by the notion that 'realities exist outside the mind'; and idealism, the notion that it is human ideas that constitute reality (Crotty, 2003). According to Crotty (2003: 11), "Realism in ontology and constructionism in epistemology turn out to be quite compatible". Interpretive research takes reality to be a human construct (Wellington, 2000). Reality is understood to be both external and constructed, and that there are at the same time multiple realities within the social world. This is compatible with a sociocultural perspective, the ontological assumptions of which presume the co-existence of, and negotiation between, multiple views of phenomena (Packer and Goicoechea, 2000).

This study is situated within a socio-cultural perspective. Packer and Goicoechea (2000) articulated six key themes of ontology in the socio-cultural perspective. These are that: the Person is Constructed, in a Social Context, Formed through Practical Activity, Formed in Relationships of Desire and Recognition, that Can Split the Person, and which Motivate the Search for Identity. At the same time, Packer and Goicoechea (2000) emphasise that these six themes suggest that the division of knower and known, or what they call 'dualism' is produced naturally through the constructivist perspective only in particular historical and cultural situations; this fits into the socio-cultural perspective. Additionally, each one of previous six themes mutually reinforces the others. The last three of the previous six themes may need some explanation. 'Formed in relationships of desire and recognition' means that human relationships contribute to the formation of a person in parallel with practical activity, but not as a purely cognitive construction. The person is formed through self-consciousness by desire, conflict, and opposition in a struggle for recognition which emerges through relationships with others; while, 'can split the person' indicates that the benefits of participation in a social context at the same time carry costs to members of a community; whereas, 'motivating the search for identity', which is the final aim of all the themes, and in which identity is an end in itself, is an effort to 'overcome division' by seeking to transcend the identification more than to root out or eliminate it (Packer and Goicoechea, 2000).

Packer and Goicoechea’s six key themes related to the sociocultural perspective’s ontology present a complementary view of the learning process which clarifies the link between learning and identity among community members. The constructivist view thus fits naturally into the sociocultural
perspective. Thus, from the point of view of those themes, the ontology of the socio-cultural perspectives is that the meanings, beliefs, preferences and behaviours of individuals are shaped by interactions within the social or cultural context. It is not a case of one thing leading causally to another but rather a case of interaction. In this perspective, meaning is negotiated and shaped via interaction and participation in social practices within the social and cultural context and relationship with others. Reality in primary school lessons can therefore be understood as socially constructed by participants through interaction and participation in social practices and in relationship with others in a social context. It is these human relationships which support children’s activity naturally in their social worlds.

3.2.2. Epistemological assumptions

Crotty (2003: 3) argues that epistemology is “a way of understanding and explaining how we know what we know” and he defines epistemology as: “A philosophical grounding for deciding what kinds of knowledge are possible and how we can ensure that they are both adequate and legitimate” (p. 8). Crotty also gives a view of “What it means to know. Understanding and values are considered to be objectified in the people we are studying” (p. 8). In addition, Wellington (2000) suggests that it is the nature and validity of human knowledge which form epistemology.

Crotty (2003) pointed out that there is a diversity of epistemologies. On one hand, objectivist epistemology assumes that meaning and meaningful reality exist as such, apart from any consciousness. On the other hand, constructivist epistemology rejects this view of human knowledge but holds to the idea that “truth or meaning comes into existence in and out of our engagement with the realities in our world. There is no meaning without a mind. Meaning is not discovered, but constructed” (Crotty, 2003: 8). A constructivist view of knowledge implies a view of knowledge the aim of which is to understand the ways in which meaning is socially constructed, and how these understandings are adapted and developed. A constructivist epistemology therefore informs this study, because the research objectives are to find out and understand the views of the people involved. The research seeks out and considers in depth the beliefs and values, needs and agendas, and levels of empowerment of its various participants, and how these are negotiated through interaction.

This study assumes that our knowledge about schooling is constructed and generated through interaction with multiple participants, individuals constructing different meanings for the same phenomenon. Moreover,
‘meaningful reality’ can be clearly understood through the construction of the teachers’ and students’ views on the experience of teaching, or being taught, thinking skills.

Using a socio-cultural ontology and a social constructionist epistemology, this study explores how the participants practice and develop their existing perspectives during interaction and communication. Such an approach is situated in the interpretive paradigm and this seems appropriate for gaining a deep understanding of the socio-cultural contextual perspectives, which this study aims to achieve. For, as Rosen (2000) explains, the process of understanding society is a social one, involving getting inside the perspectives of those who create it.

The current study seeks to document and understand participants’ beliefs, perceptions, experiences and views to offer a range of dimensions of social meaning. Also, the data collection and analysis processes involve the acquisition and generation of knowledge from teachers and students. This knowledge is constructed and generated from different participants, constructing different meanings for the same phenomenon of study.

3.3. The socio-cultural perspective

This section focuses primarily on the socio-cultural perspective, including the reasons why the socio-cultural perspective is appropriate for this study and its consonance with the teaching of thinking skills in terms of how it is reflected in the development of thinking capability. It then proceeds to focus on mediation because I believe that semiotic mediation plays a central theoretical role in forms of thinking which are shaped through interpersonal-society interaction. In discussion of mediation, I focus more on the active nature of mediation.

This study is grounded within a socio-cultural perspective which emerged initially through Vygotsky’s (1896-1934) writings. The term ‘socio-cultural’ has also been used by several authors from a variety of disciplines such as Dewey when he deals with logic and inquiry (Wertsch, 1995). Vygotsky and his colleagues usually used the term ‘socio-historical’ rather than ‘socio-cultural’. However, as Wertsch (1991) notes, the term socio-cultural may help in understanding mental action work in cultural, historical, and institutional situations and to recognize the significant contributions of mediated action on schools of thought.
The overall aim of socio-cultural research is to understand the relationship between human mental functioning and institutional settings, particularly from a cultural and historical perspective, that comes from the view that practices of human communication give opportunities for the individual to enhance their mental functioning by going outside themselves in a process of dynamic interactive exchange. The socio-cultural perspective assumes that we cannot separate mediated action from the setting in which it is carried out (Wertsch, 1991, 1995; Wertsch and Tulviste, 1992; John-Steiner and Mahn, 1996; Robbins, 2005). From this view, some authors (e.g. Rogoff and Chavajay, 1995; John-Steiner and Mahn, 1996) emphasise that the power of Vygotsky’s ideas lies in his view about the processes of dynamic interdependence between the social and the individual that cannot be separated, and that socially shared activities become transformed into internalized processes.

In addition, the socio-cultural perspective provides a deeper understanding of the nature of educational processes. This view sees educational institutions as reflecting the larger social order in which they are located. Contextualised features are built into socio-cultural perspectives, as Rogoff (2003) argued that the cultural practices and circumstances of communities can lead to understanding how people change and develop as they participate in cultural communities. According to this perspective, instructional processes take place in socially shaped contexts that are continuously changing, leading to changed contexts and opportunities for learning (John-Steiner and Mahn, 1996).

In light of the aforementioned review, according to the sociocultural perspective, to understand individual thinking processes one needs to understand their contexts, cultural settings and communities. As Vygotsky (1962: 12) states: "Directed thought is social. As it develops, it is increasingly influenced by the laws of experience and of logic proper". Individual thinking cannot be researched in a vacuum, and individual thinking is not independent of the types of activities of social life of which they form a part (Rogoff and Chavajay, 1995). In other words, a sociocultural perspective can offer a fuller picture of thinking processes, and at the same time it does not ignore the individual but assumes that construction of cognition is not an individual process, but rather a collaborative one.

Lee and Smagorinsky (2000: 2) summarize Vygotsky’s theory as four assertions. Firstly, learning occurs through interaction between the individual and other people and their cultural artefacts ‘on the inter-psychological plane’; secondly, learning through the inter-psychological plane happens in a procedure known as ‘scaffolding’, in which more culturally knowledgeable experts mentor and engage in activity with those who have less of it; this is a reciprocal process, and ‘meaning is thus constructed through joint activity rather than being
transmitted from teacher to learner; thirdly, the concepts are constructed historically and culturally and this connects them to cultural history in daily life. Thus, learning is inherently social, and 'language becomes the primary medium for learning, meaning construction, and cultural transmission and transformation'(ibid: 2). Fourthly, the capacity to learn is not limited and bounded but one can learn constantly.

These four assertions of Vygotsky’s theory are very significant elements for this study because of their influence on the definition of thinking skills for this study and for the general characteristics of models and programmes of thinking skills. In brief, encouraging and supporting interaction through mediatational means in a social setting is informed by Vygotsky’s view. Moreover, there are opportunities to use scaffolding— as a strategy for mediating thinking— between the learning of information and the learning of thinking skills when teaching or learning thinking skills via different situations such as exercises in textbooks. Furthermore, regarding the reasons why the sociocultural perspective is appropriate for this study, Vygotsky’s view shows how the nurturing of thinking is situated in a sociocultural context, in communication with others, as an effect of dynamic interactive exchange. All these points will be further discussed later in this section.

3.3.1. Why is the socio-cultural perspective appropriate for this study?

The socio-cultural perspective is the most appropriate for this study for many reasons. First of all, there is the strong relationship between learning thinking skills processes and society (Vygotsky, 1962), in that these thinking processes are constructed within the specific society’s history and cultural circumstances. Packer and Goicoechea’s (2000) theory of ontology in the socio-cultural perspective, mentioned earlier in this chapter at Section 3.2.1, emphasises that the link between learning processes and identity is constructed in a social context, through practical activity, in community membership. Thinking always has social influences and takes place in a context of interaction, whether directly or indirectly, and personal thinking is influenced by the affordances and constraints of various contexts (Moseley et al, 2005a).

This perspective recognizes the vital role of collaboration and dialogue in the strengthening of reasoning and judgment in the thinking skills field. Furthermore, "meaning making is not just an individual operation. The individual interacts with others to construct shared knowledge. There is a cycle of internalization of what is socially constructed as shared meaning, which is then externalized to affect the learner’s social participation"(Costa, 2006: 64). In
this regard, a growing body of research (e.g. Rojas-Drummond et al, 2008; Burke and Williams, 2008; Eteläpelto and Lahti, 2008) argues that the social and communicative nature of human life needs to be taken into account in the process of teaching and learning thinking skills. Furthermore, an essential factor is related to the view of thinking skills adopted in this study which applies the idea of mental functions to social as well as individual forms of activity, and thus emphasizes the primacy of social interaction in human development, as applied in the teaching and learning of thinking skills.

Secondly, the socio-cultural perspective includes many elements which are fundamental to this study, such as social interaction, and mediation. Mediation plays an essential role in promoting cognitive processes. Vygotsky (1978: 57) states: "Every function in the child’s cultural development appears twice: first, on the social level, and later, on the individual level; first, between people (interpsychological) and then inside the child (intrapyschological). This applies equally to voluntary attention, to logical memory, and to the formation of concepts". The socio-cultural perspective is relevant to the current study in that the thinking skills literature describes what is meant by cultural tools in thinking skills, showing the importance of such cultural tools, and this notion of cultural tools is derived from the socio-cultural perspective. ‘Tools’ determine a boundary between the internal and external processes (Robbins, 2005). Cultural tools which are included in the textbooks’ exercises are embedded in the students’ thinking. One such example is social values as a cultural tool that cannot be separated from a particular academic activity, and which could mediate to assist the development of students’ thinking skills in the classroom context. Another example of the significance of mediation for this study is that it provides an insight into the social dynamic interactions in the classroom context which can be influenced by different social, historical and cultural factors within educational processes, as will be discussed in more detail later in this section.

Thirdly, the sociocultural perspective is more appropriate for the context of this study, rather than other approaches. The Official Policy of the KSA was established in 1970 and included educational goals and the objectives of each phase of the education process. This policy document has not undergone any subsequent improvement or development. The policy document sets out the aims of education and puts an emphasis on the importance of society and the individual, as in these shown below:

Section one: the fundamental bases of education:
8. Development opportunities are available to every student so that they can take part in their society's development. Hence, making use of this development in which he has a share.

21. Social solidarity among the individuals showing cooperation, amiability, brotherhood, and giving a higher priority to the society’s benefits than of the individual.

Section two: the goal and aims of education

The main educational goal is to understand Islam in a proper and comprehensive way; implanting Islamic doctrine and propagating it; providing the student with values, Islamic teaching and high principles; giving the student knowledge and different skills; development of constructive behavioural attitudes; the development of society in the economic, social and cultural fields and preparing the individual to become an active member of society. (Education policy in KSA, 1978: 3 - 5)

As we can see above, there are a number of commonalities between education policy in KSA and the socio-cultural perspectives. They both emphasize that the social dimension of consciousness is primary and, at the same time, they emphasize the interdependence of social and individual processes. Moreover, they both give primacy to the interaction between individuals for the functioning of society. It is important to acknowledge that a significant aspect of this education policy concerns the spiritual aspect; it is not the function of this research to attempt to describe or explain this aspect except in relation to thinking skills. It can be argued that the socio-cultural perspective assists in achieving some sense of the articulation between the interaction between thinking skills in the classroom and practices of the culture (including spiritual ones). Craft and Wegerif (2006: 1) support this view as emphasized "In our view successful approaches to teaching thinking skills and fostering creativity, appeal not only to the cognitive but also to the affective, social and spiritual dimensions of being human".

For this reason, the socio-cultural perspective is worth further exploration and application in the local KSA context. Application of socio-cultural perspectives influenced pedagogical practices in classrooms. An example is the teacher scaffolding children’s thinking skills through engaging in a practice of socio-cultural interaction that not only extends their thinking ability, but is also involved in the formation of self-identity of the individual as a member of society, and for the individual’s prospects for future education as shown below:

Section two: the goal and aims of education:
41. Supporting and developing students’ scientific research and thinking skills. Strengthening the students’ abilities to notice and contemplate. Getting the students to observe Allah’s wonders in the universe, and realizing Allah’s wisdom in the creation of the existence. This should enable individuals to play their effective role in the organization and structure of social life and direct it properly. (Education policy in KSA, 1978: 5)

3.3.2. Mediation

The socio-cultural perspectives emerged through Vygotsky’s view about the social origins and social nature of higher thought as a uniquely human mental functioning, as well as on his understanding of culture and instruction (Wertsch, 1991). The socio-cultural perspective can be expanded on by examining three major themes in Vygotsky’s writings, as highlighted by Wertsch (1991): first, genetic analysis; second, the general genetic law of cultural development; third, mediation. I, as a researcher, believe semiotic mediation plays a central theoretical role in forms of thinking which are shaped through interpersonal-society interaction. In fact, there are different aspects of mediation: its active nature and its transformatory capacity. I will present a discussion and an explanation of its active nature, then return to how these are related to the methodological design of this study.

Wertsch has emerged as a key theorist for socio-cultural perspective; more than anyone else he is responsible for the synthesis of Vygotsky and Bakhtin often referred to as socio-cultural perspectives (Wegerif, 2007). Wertsch (1991) highlighted the nature of the interdependence between the individual and the social in the construction of knowledge examining three major themes in Vygotsky’s writings: 1- Individual development, including higher mental functioning, derives from social life. 2- Human action, on both the social and individual planes, is mediated by tools and signs. And 3- the first two themes may be examined by genetic, or developmental, analysis. In fact, there are reciprocal influences between the parts. In the next stage, I want to focus on higher mental functioning and mediation by tools and signs, as these are directly relevant to this study.

The main theme in Vygotsky’s formulation of a socio-cultural perspective in relation to this study is Mediation. In Vygotsky’s writings "the construct of mediation - especially semiotic mediation - played a central theoretical role, becoming increasingly important during the last years of his life and career" (Wertsch et al, 1995: 20). Vygotsky claimed that, in general, higher mental
functioning and human action are mediated by technical tools and signs (Wertsch, 1991). His main concern was with what Wertsch and Tulviste are calling ‘cultural tools’ and for that reason Wertsch and Tulviste shall be mainly concerned with ‘semiotic mediation’ (Wertsch and Tulviste, 1992). Edwards (2005) explained that Vygotsky’s great contribution was his development of terms of analysis of the dynamic unit called ‘tool-mediated action’ which discovered how a student developed his/her thinking. In thinking, the tool (e.g. language, concept) is used to act on and change the object, which is formed or transformed by the tool. Thus, from my point of view, one of Vygotsky’s most significant contributions to educational thinking studies is the idea of tool mediated action.

Figure 3.1: Vygotsky’s mediational triangle (version from Edwards, 2005)

Mediation is best thought of as a process involving the potential of cultural tools to shape action, on the one hand, and the unique use of these tools, on the other. Mediation presents a bridge between individual and group actions, on the one hand, and cultural and historical settings, on the other (Wertsch et al, 1995). The concept of mediation emphasizes "the role played by human and symbolic intermediaries placed between the individual learner and the material to be learned” (Kozulin et al, 2003: 2). The concepts of mediation and cultural tools in relation to this study will be discussed in greater detail later.

Basic to this perspective is Vygotsky’s insight that the inclusion of cultural tools into human functioning transforms this functioning through the incorporation of mediational processes (Wertsch and Tulviste, 1992). Wertsch, and Tulvist, (1992) argued that, according to Vygotsky language, counting, mnemonic techniques, algebraic systems, art, writing, maps, and all sorts of conventional signs can serve as examples of complex systems of cultural tools. In all cases, Vygotsky understood culture in terms of sign systems appropriated by groups or individuals. These mediational means, the products of sociocultural change and development, carry out mental functioning. The notion of culture via
Vygotsky’s account of mediation reflects the fact that he understood culture to consist of sign systems (Wertsch and Tulviste, 1992).

An underlying assumption in mediation is that people obtain information and their view of the world indirectly, or mediately, more than directly, or immediately. Those processes are generally seen as being ‘fundamentally intertwined’ (Wertsch et al, 1995).

3.3.2.1. The active nature of mediation

Wertsch and Tulviste (1992) mention, this view of action contrasts with the view that treated the individual as ‘a passive recipient’ of knowledge from the surroundings. This model applies almost across the context of this study as the researcher will explain later. Vygotsky viewed mental functioning as a kind of action that ‘may be carried out by individuals or by dyads and larger groups (Wertsch and Tulviste, 1992: 549). Thus, his view is one in which mind is understood as ‘extending beyond the skin’. Mind, cognition, memory, and so forth are understood not as attributes or properties of the individual, but as functions that may be carried out (ibid).

The part of Vygotsky’s writings which is most relevant to this study is in the nature of higher mental functions, specifically, his view that thinking and language forms a system of ‘interfunctional relations’ (Vygotsky, 1962: xxxii). In examining the relationship between speech and thinking, Vygotsky’s key emphasis was on "how different forms of speaking are related to different forms of thinking…a relationship that presupposes a widespread use of verbal mediation" (Wertsch, 1991: 30).

Therefore, a sign system is the first type of action that can be distinguished within the active nature of mediation linked with this study, in that language and talk make the students’ cognitive processing more explicit. Wertsch (1991) argued that sign systems, such as language, are key in Vygotsky’s ideas about the relationship between semiotic and other forms of the active nature of mediation, in that sign systems are a part of and mediate human action. Vygotsky viewed ‘egocentric’ and ‘inner’ speech as reflecting the individual’s thought which grows out of its community foundations (Wertsch, 1991). Thus, sign systems should reflect construction in classroom models of interaction, such as a dialogic structure as well as collaborative forms. In this regard, McGregor, (2007) shows how language supports cognitive development, by experts (such as teachers) working with novices (such as students) within their ZPD to develop students’ thinking skills.
The second essential point linked with this study is that the concept of cultural tools plays a central role in Vygotsky’s approach. In this regard, Kozulin et al (2003) emphasise that the concepts of cultural tools go beyond their theoretical role to have a significant practical function serving as a foundation for various programmes, applying contributions to new strategies for the improvement of cognitive functions and enhancement of metacognition of students, with the integration of cognitive functions into schooling practice. In this respect, I agree with Dillon (2006: 70) who emphasises that the central idea in sociocultural perspectives is that "each time a learner encounters a new situation, the sociocultural features of that situation are read afresh: learner and context interact and transform each other". Therefore, the significance of cultural tools is evident especially in the application of some thinking skills programmes, such as the infusion approach, as well as in the transition of skills from one learning context to another.

An essential feature is that cultural tools are a natural product, so unconscious organizing action occurs in those who use them. As Wertsch (1991) noted, mediation means that power lies in the organizing of action which is seen as natural. It may be unconsciously recognized by those who apply them rather than being a concrete sociocultural force. Also, there is a predisposition within the culture for certain mediational means to be used for certain purposes. Thus, certain patterns of speaking and thinking may not be the most efficient forms of behaviour but they come to be viewed as easier and more appropriate.

On the other hand, cultural tools being inherently involved in human action does not entail a mechanistically or reduced-creativity environment. On the contrary, it may encourage creativity as action includes an inherent tension between the mediational means and the individuals using them. Wertsch and Tulviste, (1992) raise the question of how creativity is possible on this model given that mediated action is always constrained by the fact of using pre-existing cultural tools. They then go on to argue that innovation is possible because each individual uses the tools differently from others; new uses can be found for old tools (Wertsch, 1991).

Furthermore, an important point here, is that tools are more than simply a support in the development of mental processes, but they are using and perhaps creating knowledge. These tools include individual experiences and feelings which are current, past and perhaps of the future. In addition, tools are embedded in the thinking of the pupil, so they cannot be separated from the activity; consequently, a significant characteristic of tools is to be able to determine a boundary between the internal and external process, or the social and individual (Robbins, 2005). Indeed, some researchers such as Davydov go on to claim that development cannot happen by the appropriation of any set of
cultural tools except by the appropriation of general tools of thinking (Renshaw, 1992).

The third essential points linked with this study include the role of the dynamic interactive relationship between teachers and students and/or among students. The dynamic interactive process may include: clarifying and exploring concepts and actions, ‘seesawing’ between linguistic and functional exchange(s), and giving priority to the learners’ perspectives in term of concepts to be used and actions to be done (McGregor, 2007).

To sum up, socio-cultural interaction and mediation are active, rather than being static, they are dynamic processes. The socio-cultural perspectives, particularly mediation related to thinking skills, assumes that learning occurs in relation to the development of independent learners and in developing relationships with other learners as well as teachers. This is related to what was discussed in the literature review, quoting Moseley et al (2005a): psychologists and educators have a wide acceptance of the idea that individual and group thinking is shaped during interpersonal interaction, among socially mediated activities, for example: dialogue, discussion between adults and students and/or among students throughout the teaching and learning thinking skills process.

Mediation is the key to the context in the socio-cultural perspective which forms the orientation of my study, particularly since it had an effect on my data collection when both teachers and students had discussions with me about what they did during the learning process. Thus mediation forms a key part of the research process itself and to this extent participants shared in production of data with me. Dimensions of the actual practical data collection and analyses thus involve mediation. As a researcher, the mediation tools used to try to understand what participants were doing were very important. It may be argued that the socio-cultural perspectives is relevant to the teaching of thinking skills in that the literature review shows the importance of cultural tools.

Mediation is a dynamic rather than a static phenomenon; an interview for example, should acknowledge that mediation is an active process of maturation. So, the important point is that the relation between myself, as researcher, and the participant was to be actively engaged. Of course, one of the aspects of this activity might be the active mediation going on in the interview and focus groups, in possible informal discussions with teachers as well as children. Also, observations were mediated as I shared my observations with my participants and asked for their comments. It was important to do this discussion as mediation.
3.4. The Sample

Sampling is ‘the process of drawing a sample from a population’ (Johnson and Christensen, 2010: 216). In the quantitative perspective, the selection of a representative and random sample is key, while in qualitative inquiry a purposeful strategy is the dominant approach. This is because the qualitative perspective focuses on the aims of the investigation, obtaining the information most useful to these aims and achieving a high level of credibility with relatively small samples of participants (Hoepfl, 1997; Wellington, 2000). Qualitative research aims to understand the conditions within which the researched phenomena occurred rather than emphasising the generalisability of findings. Therefore, qualitative samples are usually smaller than those in quantitative research (Ritchie and Lewis, 2003).

Purposeful sampling, one of the most common sampling strategies in qualitative research (Hoepfl, 1997), is a non-random sampling method in which “the researcher specifies the characteristics of the population of interest and locates individuals with those characteristics” (Johnson and Christensen, 2010: 231). Such individuals would be information-rich cases suitable for in-depth study (Patton, 2002; Wellington, 2000). Therefore, purposive sampling was used in this study.

An important point here is that the sample was limited to male teachers and students, as the educational system in the KSA segregates schools according to gender. As the current study adopted a case study approach within the socio-cultural perspective, emphasising mediation, a long contact time with the participants was required. With the aim of achieving a broad understanding of the situation of the study, one of the main tools was observation, necessitating a long period of direct observation of teachers and students by the researcher. For this to be possible, girls’ and boys’ learning contexts could not be included equally because I was not permitted to go into girls’ schools, so, I could not observe female students or teachers.

Moreover, the sample of this study consisted of seven case study classes of male students from the upper years in primary schools in the KSA, aged 10, 11, and 12 years. In two of the case study classes, thinking skills were being taught within the science curriculum, while in the other five case study classes, thinking skills were being taught within the Islamic education curriculum.

There is a lack of research into teaching and learning thinking skills at all stages of the educational system in the KSA, as mentioned before. Therefore the choice of the primary stage requires explanation. The first reason is its importance in the educational system because it forms the basis of learning thinking skills.
Second, students’ positive experiences and thinking skills outcomes at the primary stage will be reflected in the continued development of their thinking skills and their transition to the next stage of education. In this context, the rationale for the choice of the upper years in primary schools was that the students aged 10, 11, and 12 years usually have a clearer understanding of thinking skills vocabulary and terminology than do younger students.

My sample also included seven teachers who were teaching the sample of boys. I had conversations with teachers, as well as students, to understand what they were thinking; not only to talk with them but actually to help me understand teaching and learning thinking skills in the classroom. I may not have seen the whole picture as I was only able to ask about the experiences of teachers engaged with a small part of the curriculum. Furthermore, it was important that the sample should include teachers with different levels of experience and educational backgrounds, so, sampling was designed to involve a wide diversity of informants based on their work situations, teaching expertise (novice vs. experienced), and a range of experience of teaching at different preparatory grade levels (see Table 3.1). This is because the research aims to understand the experiences of participants across a range of case schools and classes.

<table>
<thead>
<tr>
<th>Case</th>
<th>Teacher’s expertise</th>
<th>Teacher's grade level and educational background</th>
<th>Numbers of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>✓  Novice</td>
<td>Bachelor of Science</td>
<td>25</td>
</tr>
<tr>
<td>2.</td>
<td>✓  Experienced</td>
<td>Bachelor of Islamic Education</td>
<td>25</td>
</tr>
<tr>
<td>3.</td>
<td>✓  Experienced</td>
<td>Bachelor of Islamic Education</td>
<td>25</td>
</tr>
<tr>
<td>4.</td>
<td>✓  Experienced</td>
<td>Bachelor of Islamic Education</td>
<td>25</td>
</tr>
<tr>
<td>5.</td>
<td>✓  Experienced</td>
<td>Bachelor of Islamic Education</td>
<td>25</td>
</tr>
<tr>
<td>6.</td>
<td>✓  Novice</td>
<td>Bachelor of Science</td>
<td>27</td>
</tr>
<tr>
<td>7.</td>
<td>✓  Experienced</td>
<td>Bachelor of Islamic Education</td>
<td>25</td>
</tr>
</tbody>
</table>

Table 3.1: The sample for all seven cases

The current study has focussed on thinking skills in two primary education subjects (Islamic education and science education). The main reason for choosing these subjects was the lack of research on these subject in general in
the KSA, particularly on Islamic education, and in relation to teachers’ and students’ experiences of thinking skills at primary level and the factors that form these experiences and practices. In addition, other reasons for choosing Islamic education were the importance of Islamic education in the KSA education system, in that it occupies a large share of the school timetable, including more than one third of the school day. Also, as mentioned early in Chapter One, Section 1.5.4, early MOE efforts to improve the status of thinking skills started with Islamic education. Furthermore, Islamic education was the first curriculum to be reformed, by explicitly adopting the infusion approach as a source of thinking skills.

Other reasons for choosing science education were that thinking skills often emerge from, and are embedded in, science content, meaning that particular kinds of thinking skills may be more relevant in science education. Also, recently, science education in the KSA education system has benefited from the Developing Science and Mathematics Curriculum Project as mentioned in Chapter One, Section 1.5.4. Thus the researcher can compare and interpret the two subjects, building ideas about the development of thinking skills in both of them, as the current study has done in Chapter Eight, Section 8.2.1.

In this regard, the focus in this study has been on thinking skills because since 2007 the MOE has explicitly adopted an infusion approach as a stimulus to thinking skills for both teachers and students in the primary Islamic education and science textbooks. It is hoped to make an important contribution to the development of an understanding of these gaps among Islamic education and science teachers, relating to teachers’ and students’ experiences of teaching thinking skills, and the factors that form these experiences and practices, as well as the obstacles facing the implementation of teaching and learning thinking skills in primary classrooms in the KSA context.

3.4.1. Case Selection Technique

The initial selection of sites for the sample was undertaken by supervisors (an expert professional who helps teachers’ professional growth and solves instructional problems they face to improve the educational process) from the local public administration of education in Al-Qassim region in the KSA. The first stage was to obtain permission from the local MOE. The teachers’ cases were evaluated and mentored by the MOE, who requested a summary of my study including its overall aims, questions, and research tools. Then the supervisors of the local MOE sent an email to all primary schools in Al-Qassim
region regarding the study. In the second stage, aiming to achieve as much diversity in the purposive sample as possible, I met officers in the Office of Educational Supervision in south and north Buraydah. In both meetings the level of school most appropriate for my study was discussed, as well as the likelihood of the teacher being interested in the application of thinking skills in the classroom. They then nominated a list of teachers who might be appropriate as case studies for my research, in that they would be interested in teaching thinking skills and would accept me as a researcher spending three months with them in their classroom.

At the third stage, the selection of cases stage, the supervisor listed about 19 teachers, which was then filtered down to 10 as some names had been repeated. After that, I visited each teacher, and decided who would be appropriate to my research. Several criteria were taken into account when selecting the sample. One of them was to ensure a diversity of expertise and age among participating teachers; their years of experience ranged between three and thirty years, with ages between the mid-twenties to mid-fifties. Another criterion was to obtain a social variety as the cases were selected from each side of Buraydah city. By then, I had selected seven suitable cases, with none of whom I had had any previous relationship or knowledge.

The sample of students for interviewing and for particular focus for lengthy and detailed classroom observation was determined using specific criteria, formulated in advance, involving their appropriateness for my study, their consent for participation, to obtain a representative sample of all academic levels, and to reduce the bias which would occur from over-concentration on a particular student and class. Therefore, I asked each teacher to nominate students whom they considered appropriate cases for my study. Final selection was made from my own notes and the teachers’ suggestions, bearing in mind ethical considerations as will be discussed later in this Chapter at Section 3.8.

3.5. Research Design

In this section, the plan of the study and the methodology to be used will be explained. This information will be presented in five parts, two of which will concern methodology, that is, the design of data collection methods. In addition, the pattern adopted for the study and data collection methods will be explained, and the advantages and limitations of each method considered.

Methodology is defined as "the study of the methods, design and procedures used in research" (Wellington, 2000: 198). The interpretative approach is
therefore suitable for the complex details of the phenomena of this study because the kind of data consists of individual views and experiences. To elicit teachers’ and students’ experience of teaching and learning thinking skills, this study is situated in an interpretative design, seeking a depth of understanding of participants’ experiences. A significant reason for selecting an interpretative design as paradigm is to allow insight into the lived experience of teachers when teaching thinking skills. Within the qualitative research there are different layers of interpretation, particularly in the processes of translation.

As this study focuses on experience and interactions between people, so, I used multiple forms of data collection to strengthen the research design and to give depth to research findings. A qualitative research design which combines multiple methods will help to reduce the errors that may occur in a single method (Patton, 2002). The aim of using different data sources is to ensure greater data reliability and to achieve greater balance to safeguard trustworthiness, and protect against bias. More detail on these methods will be presented later in this chapter in Section 3.7.

3.5.1. Case study

A growing body of research argues that the basic intent of case study is the desire to better understand a phenomenon (e.g. Yin, 1994; Denscombe, 1998; Wellington, 2000; Cohen and Court, 2003; Bell, 2005). Yin (1994: 13), explains a case study as “an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident”. The decision to use a case study methodology in order to gain a deep understanding of this particular case is fueled by a desire that this understanding may shed light on the broader phenomenon of which this is a particular case (Wellington, 2000; Cohen and Court, 2003). Additionally, case study strategy allows the use of a range of research methods and data sources which provided the best insight into answers to the questions of this study, as well as maximising the validity of the data collected. Another advantage is that case study is a suitable procedure for an individual study as it allows depth of study within a limited time period (Bell, 2005). The case study focuses on relationships and social processes in order to understand various aspects of the situation under study and how these different sections are linked and interact (Denscombe, 1998). The strength of case studies, as pointed out by Wellington (2000), is that they are particularly strong on reality, which is clearly of value in the teaching process.
The literature provides several useful classifications of case studies, one of which comes from Wellington (2000) who classifies case studies into three categories: historical-organizational, observational and life history. Perhaps observational case studies which include observations of an organization and its members may also contain historical aspects. Observational case studies may be consistent with this study. Mediation, being the main aspect of the socio-cultural perspective which forms the orientation of this study, had an effect on my data collection. In other words, mediation forms a key part of the research process itself as participants shared in the production of data with me. On the other hand, Yin (1994) distinguishes between three types of case study: descriptive, exploratory, and explanatory. The purpose of the descriptive type is to provide a whole description of the phenomenon of which the case is one example, while the explanatory aims to elucidate the cause and effect relationships within the case. Descriptive and explanatory styles were adopted in the present study since these styles seem to be suitable for the production of relevant data.

Therefore, observational descriptive case studies help to produce a more nuanced understanding of the experience of teaching and learning thinking skills. Also it focused on particular instances of events and processes and explores what factors appear to guide teachers’ and students’ experiences of thinking skills. Case study allows for the exploration of, and introduction to, thinking procedures and knowledge of thinking skills which are used in the classroom. It also permits the discovery of influences which appear to guide teachers’ and students’ experiences of thinking skills education.

In reviewing the research literature, it is noticed that a case study can involve various types of data collection. The interview is clearly a significant part of case study where participants who have been involved with that case are interviewed. Observation is an important element of case study, particularly participant observation where the researcher participates in the actions being studied (Wellington, 2000). The use of group discussion, that is, interaction among group members on the subject provided by the researcher (Morgan, 1997), is a further technique. Another point is that a case study can involve an evaluation or simply a 'feel for' the style and culture of the case study. Impression and insight can shape elements of the 'case record' (Wellington, 2000). Finally, Cohen and Court (2003) emphasised that the social and historical context of the case study must be understood as well, in order to achieve meaningful conclusions of research.

Rudduck (1985 in Wellington, 2000) argues that there are three stages in case study research: the case data, the case record and the case study. Wellington added a fourth stage in some multi-site research which is the seeking of
generalizations. Regarding the last stage, many theorists (e.g. Yin, 1994; Denscombe, 1998; Wellington, 2000; Cohen and Court, 2003; Bell, 2005) have argued that generalization is a consistent weakness of case studies, particularity of small studies. In this connection, I agree with Cohen and Court (2003) that the term ‘extrapolation’ may be a more appropriate word than ‘generalization’ to describe how findings are extended beyond the original case. However, in order to dispute this perception, the present study was not designed to attempt to generalise its findings. Wellington (2000) and Denscombe (1998: 40) pointed out another weakness of this approach, which is that ‘case studies are often perceived as producing ‘soft’ data’ (Denscombe, 1998: 40). This view is that case studies focus on processes rather than on measurable outcomes. They adopt the methods of qualitative research rather than the quantitative statistical procedures of positivist methods. Despite the difficulties mentioned above in relation to case study research, I am in accord with previous research indicating that the case study was certainly a valuable strategy in this research in presenting the richness of the material and multiple data sources, in addition to multiple interpretations of experiences of the teaching/learning thinking processes. In my research, through the seven case studies, I am trying to understand the experiences of participants in the teaching/learning of thinking skills.

3.5.2. Instruments of data collection

The study is situated within the interpretative paradigm, seeking a depth of understanding of participants’ experiences. Data collection therefore involved a variety of naturalistic methods. A significant reason for selecting the interpretative paradigm was to allow insight into the lived experience of teachers and students when teaching and learning thinking skills. The instruments used involve semi-structured interviews, participant classroom observation, and group discussion, which are frequently a significant element of case studies’ attempts to identify the essential key issues in socio-cultural contexts. The decision to use "the combination of multiple methods, empirical materials, perspectives, and observers in a single study is best understood then, as a strategy that adds rigour, breadth, and depth to any investigation” (Denzin and Lincoln, 1994: 2).
3.5.2.1. The interview

The central purpose of choosing the interview as a method is to engage with participants in order to elicit their experiences of teaching and learning thinking skills and to identify the influences which appear to guide teachers’ and students’ experiences of thinking skills, pursued as they arise naturally, with depth of understanding, and to allow participants to express their own opinions in their own words. Wellington (2000) suggested that there are several kinds of interview: structured, unstructured, and semi-structured. In this study, the semi-structured interview was used since it has a number of advantages over other types of interview. The semi-structured interviews is a sensitive, powerful, way of understanding others and capturing the experiences of participants and conveying their own words, own perspective and own world (Kvale, 1996).

As Wellington (2000) mentioned, a key characteristic of the semi-structured interview is that it gives the researcher more control over the interview than the ‘unstructured interview’ in which control is shared between both sides. This means there is some freedom left for the interviewee and that the sequence of questions is not completely pre-determined by means of a schedule or checklist of questions. Another characteristic of the semi-structured interview is that it is fairly flexible, in contrast to the ‘unstructured interview’ which has much greater flexibility, or ‘the structured interview’ which has less flexibility. In this situation, I introduced an interview topic, then encouraged the interviewee to explain their experience and allow participants to express their own opinions in their own words.

Semi-structured interviews seem to be suitable for the production of the data; I intended to obtain by following up ideas that emerged through the interview and exploring the motives and feelings of participants which are of importance to them. The aim was to allow insights to emerge as the interview progressed. Thus, the key role of the interview was to engage with participants in order to elicit their experiences of teaching and learning thinking skills and to identify the influences which appear to guide teachers’ and students’ experiences of thinking skills as they arise naturally. During each interview, respondents’ accounts were recorded on a digital voice recorder, and respondents were probed for further detail and description as necessary. Then, after the interview, I transcribed the recording and later returned the transcripts to each of the participants for their confirmation.

My interview schedule presented open-ended questions to illuminate issues and encourage in-depth participant contributions, with the aim of exploring their perceptions and to reconstruct their own experiences about
teaching/learning thinking skills (see Appendix 2 and 3). These questions were arrived at by considering the literature, as well as my previous experiences of teachers from the pilot stage of this study. Interview schedules were first written in English, and then translated into Arabic to be administered to participants and then translated back into English. At the beginning of each interview, I explained to the interviewee the main aims of the research. The semi-structured interviews covered three main content areas (see Appendix 2).

The trustworthiness of interviews was taken into consideration through corroboration of data in terms of relevance and later through returning the transcribed recording to participants for their confirmation. Also, to ensure that participants grasped the meaning of questions, the wording was varied and simple. However, there are certain limitations of interviews. Acknowledging that the term 'bias' differs when applied to qualitative research, as will be mentioned in Section 3.10, several possible biases can result from the research operation for both the researcher and the interviewer, so, such that these biases can lead to a reply outcome in which the interviewee may give inaccurate information which affects the findings. Furthermore, selectivity by the researcher may introduce bias, as may attention to detail and interpretation of the data. To address this issue, numerous interviews are conducted to increase the dependability of findings. Also, the researcher made efforts to put aside his own individual views and refrain from influencing the data and the findings, as will be discussed in some detail in a later section 3.10 in this chapter. Also, more detail about carrying out the interviews, such as the number and length, will be given in Chapter Four, Section 4.5.1.

3.5.2.2. Observation

Observation is one of the commonest data collection methods used in case study. Observation is a useful data collection method within the socio-cultural frame because it helps to discover a number of details and aspects of the scenes of life and culture in the society. Observation does not rely only on what participants say, rather it is based on direct evidence of the eye to see the events (Denscombe, 1998).

In the literature on research methods, there are two main types of observational technique: participant and non-participant. I chose the participant observation as this is the more appropriate technique for the theoretical framework of this study. "This is the chief technique of data collection for ethnographers and anthropologists, who submerge themselves in the culture, customs, norms and
practices of the people they are studying” (Grix, 2004: 129). In addition, the essential aim of using observation is to determine whether participants behave in the way they claim to behave (Bell, 2005). Thus classroom observation was a significant data source for this study; through it I was able to develop my understanding of the processes of teaching/learning thinking skills in the classroom and the context in which it is taught.

The purpose of the observation was for the researcher to begin to investigate the actual situation regarding the teaching/learning of thinking skills in the classroom and to develop preliminary ideas as to what kinds of influences appeared to guide teachers’ and students’ experiences of thinking skills lessons. So, the key role of the observation was to enable me to develop my understanding of the processes of teaching/learning thinking skills in the classroom and the context in which it is taught. Also, classroom observation was a significant data source yielding direct visual evidence which could ascertain whether participants behaved in the way they claimed to behave. Zepeda (2007: 96) explains that “qualitative classroom observation would include the scripted notes of the supervisor or peer coach”; thus, throughout the observation I counted numbers of particular instances and took descriptive notes. Information was recorded about the physical management, teaching methods, techniques, and teacher and student behaviours surrounding the development of thinking skills.

Field notes were taken throughout the observational process focusing on such features as interaction and task involvement. Furthermore, the findings of the classroom observations informed the guiding interview questions for the individual interviews. In this study, participant observation was undertaken during which my initial role was to explore teachers’ and students’ experiences of teaching/learning thinking skills in primary schools, and the factors that formed these experiences and practices, such as the strategies and techniques of teaching thinking skills, the activities and interaction among students and with their teachers, and the main challenges that face teachers and students when they are teaching/learning thinking skills in the classroom.

As a qualitative observer, I was trying to build friendly relations with the participants to reach the maximum possible rapport with them, to get a deeper understanding of their experiences in teaching and learning thinking skills. Also, such a relationship ensured their ease and that they are acting in a natural way, as they would without the observer present. More than one set of observations may reduce the impact to be expected on the participants as I, a stranger, spend time with them in the classroom. Moreover, the observations guided the selection of the interview sample of students, as mentioned in Section 3.4.1., through providing a preliminary indication of which students
would be suitable for my study, ensuring a wide diversity of informants based on their academic levels.

All classroom observations were conducted by the researcher himself without any help. I started each observation with video recording which, like the field notes, was carried out in every lesson in order to cross-check and validate what I had written when I needed it. Furthermore, I started with a structure of categories in order to make sense of my observations. Each of the case study classes was observed for a minimum of five class periods. I choose to take the role of classroom participant rather than observer because this enabled me to obtain more detailed information about participants’ experience of teaching and learning thinking skills within the KSA primary curriculum and what kinds of influences appear to guide teachers’ and students’ experiences of thinking skills lessons. The observations lasted for approximately forty-five (45) minutes (length of each lesson is forty-five minutes), with each participant being observed (for an example, see Appendix 11). More detail about applying the observation will be mentioned later in Chapter Four, Section 4.5.2. Finally, one of the essential limitations of observation is that different individual perceptions of events may produce different accounts of the same case. Denscombe (1998) suggested that to attempt to reduce this effect, systematic observations grounded on an observation schedule should be used and this was done in this study (see Appendix 8).

3.5.2.3. Group discussion

Instruments which allow an interactive and deep conversation with the participants are appropriate for uncovering the participants’ views of thinking skills in their socio-cultural context. Group discussion (also known as focus groups or group interviewing) was one of the data collection methods used to gather information in the current study to explore and understand a specific set of participant’s views and experiences of thinking skills. The focus group has been defined as a “carefully planned series of discussions designed to obtain perceptions on a defined area of interest in a permissive, non-threatening environment” (Krueger and Casey, 2000: 5). Group discussions have continued to be a popular instrument of data collection since the 1970s and 80s, designed to explore people’s experiences within social science (Kitzinger, 1994). Focus groups “do not easily tap into individual biographies or the minutia of decision-making during intimate moments, but they do examine how knowledge and, more importantly, ideas both develop, and operate, within a given cultural context” (ibid: 116). In group discussions, the researcher ‘moderator’ role is as a
guide and facilitator, aiming to promote a dialogue between each member of
the group rather than a one-to-one interview (Grix, 2004). It is important to
ensure that each participant gets a chance to interact and gives his opinion
about the issue of discussion.

There are two different modes of group discussion in educational research,
according to Lindlof, and Taylor (2010: 183). The most relevant one for the
current study is the 'complementary interaction' since it has the advantage of
allowing members of the group to reach a consensus and add their own
observations on the topics under discussion. Through adapting this mode to
investigate the most significant aspects of participants' experience of the
phenomenon of study through social interactions, is one of essential aspect of
the sociocultural perspectives. So, the key role of the group discussions were to
allow exchange of information by interaction between students, which helped
me to reach deeper and more insightful understandings of phenomena; they
also encouraged open conversation facilitating students' thoughts and
expression regarding the learning of thinking skills in the classroom.

The use of a focus group has various advantages over other data collection
methods. Group discussion allows exchange of information in a situation where
the participants may feel safe and at ease as they are talking with their peers
(Wellington, 2000). Another advantage, especially in this study using the socio-
cultural perspective, is that it encourages a variety of communication among
participants, revealing their attitudes, feelings, beliefs, and experiences within
their sociocultural context. Thus, the interaction between participants helped
me to reach deeper and more insightful understandings of phenomena than
those obtained from one-to-one interviews. Furthermore, focus group
discussions can encourage open conversation that facilitates participants' thoughts and expression that might be underdeveloped during an interview
process (Kitzinger, 1994). An advantage regarding the researcher, Kitzinger,
(1994) argued, is that during detailed interaction among group members the
researcher could explore the differences between group participants because
participants influence each others' ideas. Also, the researcher can explore these
differences in order to clarify why such differences exist. On the other hand,
one of the essential limitations of group discussion is the possibility of
monopolization by a few participants (Wellington, 2000). To avoid this
limitation, careful management, with censorship of any deviation by any
individual, can help strengthen and improve the quality of the data.

The group discussions were completed in a similar process to the interviews
and classroom observations, being recorded on a digital voice recorder, then
transcribed. Their purpose was explained and their trustworthiness considered.
More detail about carrying out the group discussions will be provided later in Chapter Four, Section 4.5.3.

3.6. The pilot study

The main methods of data collection were piloted with my supervisors, colleagues from the University of Exeter (UK), two MOE (KSA) supervisors and two MOE teachers, after which they were modified and adjusted to become the revised interview, observation and group discussion schedules. The process of piloting data collection methods was undertaken several times by sending email copies of research instruments to colleagues, supervisors and teachers to obtain their feedback on the clarity and relevance of the items in the interview and observation schedules. Revised versions were then sent to my supervisors to obtain their comments to ensure that the formulation of items was appropriate to the respondents, and that they were clear, easy to answer and allowed an easy expression of their own opinions. The design of observation schedules was also examined. These processes highlighted the importance of combining academic (e.g. my colleagues) and field (e.g. teachers) experiences, and local and international professional (e.g. my supervisors) experiences. A two-way commenting processes was thereby employed to achieve the best possible design of the research instruments.

A pilot study was undertaken in the two weeks, aimed at an examination of the revised interview, observation and group discussion techniques. Therefore the pilot study was the introductory stage for the main study. The pilot study informed the main study to ensure that the methods of data collection are feasible in the live context of KSA primary schools. At the end of the pilot study I conducted a meeting with teachers and students in order to obtain feedback to enhance the clarity and relevance of the items in the interview, observation and group discussion schedules, particularly regarding the thinking skills terminology used as will be mentioned later, in Chapter Four, Section 4.2.

The pilot process was instrumental in sharpening both the interview, observation and group discussion techniques, as well as time management skills, gauging how long the interview session in the real study would take to complete. I conducted the interviews in an informal style, following each question by a discussion in order to generate as much relevant information as possible. Through the pilot process I checked whether the study questions seemed researchable, in terms of whether there was an appropriate correspondence between the questions, methods, methodology and sample.
More detail about the pilot process will be given later, in Chapter Four, Section 4.2.

3.7. The process of data collection

This section will discuss some detail of the stages at which the various instruments of data collection were used in this study in addressing the study questions. Before conducting this study, I had to ask permission to carry out my fieldwork from the MOE in the KSA in order to use a group of teachers and students as participants in the study. The processes of data collection occurred in three phases as shown in Figure 3.2.

The observations were carried out as the first stage of data collection. Each teacher was observed, together with their students, regarding their actual practice of teaching and learning thinking skills. The aim of the observations was for me to begin to investigate the actual situation regarding the teaching/learning of thinking skills in the classroom, to understand the dynamics of the classes and to reveal lived experience for both teachers and students. The observation provided an initial platform from which I could choose the students’ interview sample based on their appropriateness for my study and to obtain a representative sample of all academic levels as mentioned early in this Chapter at Section 3.4.1.

The second stage of data collection was the interviews, which were conducted with those teachers and students to get a greater depth of knowledge regarding the fundamental issues of the study. The main reason for these interviews is to collect teachers’ and students’ experiences of teaching and learning thinking skills and their reflections upon these experiences, and to identify the influences that appear to guide teachers’ and students’ experiences of teaching/learning thinking skills.

The third stage of data collection was the group discussions. Focus group interviews were conducted with students to cross-check information on the interviews and to get a greater depth of knowledge through interaction among participants and ways in which individuals are affected by others through a collective position regarding the fundamental issues of the study.

I also gave a more detailed description of the nature of the study to the directors, teachers and students before each method was carried out. Before I started the interviews and group discussions I explained the key terms to be
used, in addition to giving clear guidelines, in order to address any potential misconceptions.

An outline of the data collection process is given in Figure 3.2, below.

![Figure 3.2: The process of data collection](image)

The main concerns throughout the process of data collection were connected to ethical considerations, and the trustworthiness of the research, especially its credibility, transferability and dependability, as will be mentioned later in this chapter, in Section 3.10.

### 3.8. Ethical Considerations

The issue of ethical consideration in educational research has become important (Cohen et al, 2000; Wellington, 2000; BERA, 2004). Recently there has been an increasing body of literature on research ethics and most researchers and research institutions have reconsidered the importance of establishing clear guidelines in research ethics. The present study adopted the ethical guidelines of the University of Exeter and the British Educational Research Association (BERA) ensuring that important issues, such as informed consent, anonymity, confidentiality and secure storage of data are properly addressed during data collection for all involved. With regards to the ethical issues, Wellington, (2000)
asserts that ethical issue have to be the forefront concerns of any research project and have to continue until the final stages of the project.

A number of ethical issues arose from the literature review which should be taken into account in this study. I obtained permission and written consent forms from all mentioned participants and obtained explicit permission to access the school. Prior to data collection, the local MOE in Al-Qassim region in the KSA was sent an official letter to the schools requesting permission to conduct the research, since they are both under their auspices. Similarly, I obtained fully informed parental consent through written consent forms for all participants involved in the study (see Appendix 4). Moreover, throughout the data collection stage I informed the participants of their right to withdraw for any or no reason from the study at any stage.

The importance of the confidentiality and anonymity of participants was taken into consideration. Pseudonyms were used for participants’ names and workplaces, and details of their lives and environment were concealed. The confidentiality and anonymity of participants’ data was ensured at all stages of the research (BERA, 2004). This is the reason for encoding all names of schools and participants involved in this study. Another important issue is that I stored the research data securely to protect information and confidentiality.

I also provided participants with information about the aims, purposes and procedures of the study. As scholars and the Council Organization (e.g. Wellington, 2000; BERA, 2004) have pointed out, informing participants of the aims, purposes and procedures of the study is one of their rights to know what they are to be engaged in and the possible consequences for them. This applied also to video recording of lessons which (like the field notes) was arranged by informing the student in advance of the aims, purposes and nature of the video recording. The aim was to ensure that they understood the nature of the video recording, what I was going to do in class and why, how the video recording would be used and who would be dealing with it. This ensured that participants felt fine and were aware of the operation in which they were going to participate.

Throughout the study, I considered the ethical implications of all its operations. However, some of the particular ethical challenges emerged during the study, which is often unintentional or in the nature of social enquiry, such as aspects of power relationships, tensions between teachers and students or between myself and students. To address this, I took steps to minimize the effects of power relationships, either direct or indirect, such as informing the participants of their right to withdraw from the study, taking measures to reduce feelings of discomfort, and minimizing distress during the research process, particularly
where teachers chose children to participate. Another ethical challenge was that only males participated, as discussed in this Chapter at Section 3.4.

3.9. Data analysis

There are several recognized procedures for analysing data for qualitative research (Yin, 1994; Denscombe, 1998; Wellington, 2000). The adoption of diverse tools of data collection entails the use of various approaches in data analysis. In this section, the data analysis methods and qualitative data will be outlined. In this study, the data analysis process was commenced with the compilation of all relevant notes, demographic information and participants’ information into partly processed data through the interviews, observations and group discussions that allowed me to make sense of the teaching and learning thinking skills context.

Data analysis in qualitative research looks for recurrent patterns in data. It “consists of preparing and organizing the data for analysis, then reducing the data into themes through a process of coding, and condensing the codes, and finally representing the data in figures, tables, or a discussion” (Creswell, 2007: 148). Tesch (1990, in Wellington 2000: 149) discusses the principles for analysing qualitative data and the steps for coding it. Some of these principles that were used in this study are:

1. Data were divided into relevant and meaningful 'units';
2. The data segments were categorised according to an organizing system that is predominantly derived from the data themselves.
3. The main intellectual tool was comparison. The method of comparing and contrasting is used for practically all intellectual tasks during analysis: forming categories, establishing the boundaries of the categories, assigning data segments to categories, summarizing the content of each category, finding negative evidence etc. The goal was to discern conceptual similarities, to refine the discriminative power of categories and to discover connections.

3.9.1. Grounded theory as a data analysis method

This offers a data-driven approach founded on iterative inductive and deductive cycles where theory is generated, in contrast to analysis which is driven by a deductive process of analysis (Glaser and Strauss, 1967).
GT is a systematic method of qualitative data analysis that contains a set of procedures which lead to the generation of theory from data collection (e.g. Wellington, 2000; Grix, 2004). Grix (2004: 111) suggested that grounded theory "can be understood as an attempt to close the gap between theory and research (by 'grounding' theory in empirical data)". GT is generally associated with inductive analysis strategies because the data is dealt with without any preconceived codes or categories. After initial data collection, researchers seek relationships among concepts in the data and interpret them in their social and cultural context in order to generate the theory (Grix, 2004).

However, some criticisms have been made of GT as a method of data analysis in qualitative research. The main criticism concerns the systematic analysis process of classic GT (Glaser and Strauss, 1967) which assumes that the researcher adopts a position of neutrality. It assumes the researcher is unbiased and puts aside all his/her previous experience before proceeding with the data analysis, making the process purely objective, which may be an unrealistic assumption. In response to this criticism, Charmaz (2006) developed a new model of GT, called 'constructivist grounded theory', to solve the inconsistency of classic GT on the role of the researcher and to recognise the subjectivity of the researcher’s position. The following points summarize the 'constructivist grounded theory' stance:

- The grounded theory research process is fluid, interactive, and open-ended.
- The research problem informs initial methodological choices for data collection.
- Researchers are part of what they study, not separate from it.
- Grounded theory analysis shapes the conceptual content and direction of the study; the emerging analysis may lead to adopting multiple methods of data collection and to pursuing inquiry in several sites.
- Successive levels of abstraction through comparative analysis constitute the core of grounded theory analysis.
- Analytic directions arise from how researchers interact with and interpret their comparisons and emerging analyses rather than from external prescriptions. (Charmaz, 2006: 178)

Constructivist grounded theory recognises that the researcher interacts, interprets and compares through his/her existing experience and knowledge of what they study, rather than denying it. It recognizes that it is too difficult for the researcher to be totally empty of their previous experience and knowledge when dealing with the data analysis process. Also, the constructivist grounded theory supposes that "both data and analyses are social constructions that reflect what their production entailed" (Charmaz, 2006: 131).
The main reason for adopting constructivist GT in this study is to facilitate a useful understanding of the phenomena under investigation. This is because there is a lack of existing theories of the successful teaching and learning of thinking skills in the classroom in the KSA context. Therefore, GT with the constructivist grounded theory approach stance is the most suitable approach to take in the current study, as a method of data analysis which occurs during interaction in the socio-cultural perspective within the wider qualitative approach. In this study, constructivist grounded theory was used through three stages (see Chapter Four, Section: 4.4).

3.10. Trustworthiness of the study

Qualitative research uses criteria for trustworthiness by which the research findings may be interpreted and judged (Hoepfl, 1997). According to Lincoln and Guba (1985: 290), the essential task addressed by trustworthiness is: “How can an inquirer persuade his or her audiences that the research findings of an inquiry are worth paying attention to?” Addressing trustworthiness in this study was achieved by adopting several strategies and use different data resources; the aim is to preserve trustworthiness as well balance objectivity and protect against bias to guarantee greater data reliability.

To ensure trustworthiness, the use of multi-method data collection in this study (semi-structured interviews, observations and group discussion) helped to reduce uncertainty and produce wider and more secure results. Assurances of anonymity should also reduce bias in participants’ responses. However, the term ‘bias’ differs when applied to qualitative research because this does not aim to create universal laws, as this view in large part assumes. The fact is that contexts of study are always in continuous change.

However, in the literature of qualitative research there are other alternatives for judging and establishing trustworthiness. Lincoln and Guba (1985) suggested principles as alternatives to traditional quantitative criteria to establish the trustworthiness of qualitative studies which are: credibility, transferability, and dependability, which replace the commonly used criteria of quantitative research which are: internal validity, external validity and reliability (see Table 3.2). Hence, for more accurate data, the principles mentioned above were adopted in this study to ensure trustworthiness. Table 3.2 presents a comparison of criteria for analysis of research data: the quality of quantitative versus qualitative research:
Credibility is an essential principle in ensuring the quality of qualitative studies, meaning, in general, that they are reliable, or at least plausible, and particularly give priority to the point of view of those involved in order to understand the phenomenon of study from the perspective of the participants. According to Hoepfl (1997), credibility is a criterion for qualitative research that parallels internal validity. Credibility of the present study is warranted by using several techniques and different sources; the most crucial technique for establishing credibility is triangulation which includes several data collection tools. According to Arksey (1999), triangulated data aims, not just to use different sources, but rather to recognize the known sources of bias, together with the strengths and weaknesses of the various methods, as well as applying the various methods in such a manner that they balance each other.

The aim is to provide a holistic account that involves the views, perspectives, experience, and values of the participants of the study. Therefore, I used several methods: interviews, classroom observations and group discussion. An essential aim is to adopt triangulation in this study so that it can serve to provide an opportunity for looking at a particular situation from different angles to enhance the credibility of the data as well as its trustworthiness. It also enhances interpretability, instead of a single set of data that may be atypical or biased. Triangulation can serve as a means of raising confidence that the data are trustworthy (Denscombe, 1998).

Member checking is another important strategy for warranting the credibility of data and reliability of findings. Member checking is a process of confirmation by which "the transcribed interviews or summaries of the researchers’ conclusions are sent to teachers for review. In addition, researchers continually monitor their own subjective perspectives and biases by recording reflective field notes or keeping a journal of their thoughts" (Lodico et al, 2006: 274). Through using member checks, participants can ensure that they have enough opportunity accurately to represent their own views. In the present study, member checks were carried out over several stages. For example, interviewing
teachers and some students more than once, allowed participants to confirm their ideas and my interpretation of their experiences and views. Additionally, at the end of the interviews I shared my interpretations and conclusions, as an essential stage for both member checks and ethics, in order to see if my interpretations have sufficiently represented their experiences regarding thinking skills.

Given the importance of credibility, peer briefing was adopted as another technique to improve trustworthiness; the aim is to protect against biases during the analysis of the data. Two peers from the KSA who are studying for their PhD at the School of Education in the University of Exeter were used, as they come from the same background of my research. I explained the steps of the analysis, in general, and showed them interpretations and conclusions in order to elicit their comments and allow them to point out any subjectivity of his opinions in the analyzing process.

Transferability is another component of the trustworthiness of qualitative studies. According to Hoepfl (1997), transferability is a criterion for qualitative research that parallels external validity. This principle implies that the results have applicability to other settings (Lincoln and Guba, 1985; Thomas et al, 2005). According to Lodico et al (2006: 275), although the qualitative approach does not anticipate that results would have applicability in other contexts, it is probable that ‘the lessons learned in one setting might be useful to others. However, qualitative researchers insist that the reader must make this judgment because the appropriateness of the lessons depends on the contextual similarities and differences of the sites’. Thus, transferability refers to the richness or thickness of the descriptions involved in the study. Also it requires a meticulous description of the research context within which the research occurred, not only whether a representative sample was used in the study, but through thickness of the descriptions such that the reader (not me) can decide whether a similar perspective can be relocated to other situations or locations via a depth of understanding of how the perspective was arrived at on the site (Lodico et al, 2006).

Transferability, in the present study, was boosted by going beyond the particular community of the phenomena, through presenting more precise and wide descriptions of the different perspectives of the sociocultural context involved, clearly identifying the details of the setting, as well as giving detailed descriptions of the participants’ experience. The main purpose of improving transferability is to present clearness and richness of description of the phenomena so that the reader might be able to apply the results to other contexts.
Regarding dependability, this criterion shows that the results have consistency and could be repeated in other settings (Lincoln and Guba, 1985; Thomas et al, 2005). Thus, the dependability principle in qualitative research is equivalent to reliability (Hoepfl, 1997). Lodico et al (2006: 275) suggest that dependability refers to ‘whether one can track the procedures and processes used to collect and interpret the data. Good qualitative studies provide detailed explanations of how the data are collected and analyzed’. In this study, dependability was boosted by wider explanations, and details of the procedures and processes used to collect, analyse and interpret the data were given as far as possible, though it should be acknowledged that in qualitative studies it is not possible to include all data as emphasised by Lodico et al (2006).

3.11. Chapter summary

This chapter has explained the paradigm for the study and the reasons for which the interpretive paradigm has been chosen as the best option. Then, this chapter has presented the theoretical framework through explaining the characteristics of sociocultural theory and matching these characteristics with this study. In addition, descriptions of the methodology and methods have been outlined as well as the sampling approach, and the data analysis for each data collection method. Ethical considerations have also been addressed. This chapter also offers an explanation for trustworthiness as a quality of the research. The next chapter presents the main stages of the data analysis approach applied during the study.
Chapter Four

Analytic Approach
4.1. Introduction

This chapter discusses the main stages of the analytic approach to the data that was applied during the study. The data analysis focussed on the research questions:

1) **What are the experiences of male teachers and 10-12 year-old students of teaching and learning thinking skills in the KSA primary curriculum?**

2) **What factors appear to guide teachers’ and students’ experiences of thinking skills?**

3) **What are the main perceived challenges facing teachers and students when they are teaching/learning thinking skills?**

The analytic approach of this study was a holistic one. To answer the research questions in the analytic approach amalgamated data from the various research methods, as shown in Table 4.4, rather than analysing the data in a fragmented way. It was decided to use a holistic approach because the data were so rich, offering multiple perspectives on the teaching and learning of thinking skills across each of the seven cases. Thus, I combined the data together to present the whole picture of teachers’ and students’ experience when they are teaching/learning thinking skills, rather than taking them one at a time.

4.2. Pilot Study

Discussion of the outline data collection stages cannot be undertaken without first discussing the pilot study stage. A pilot study was undertaken in the two weeks prior to May 2010, before conducting the main research, aiming to ensure that the methods of data collection were feasible in the live context of KSA primary schools. The data collection instruments used were interviews, classroom observation and group discussion; by using three methods it was hoped to enhance the credibility of the data by triangulation. The pilot study comprised an introductory stage to check the practicalities of the data instruments and then to develop the instruments of the research, i.e. the interview and observation techniques and group discussions.

The pilot interviews were conducted with two teachers and two students. I sought to conduct the interviews in an informal style, following each question by discussion in order to generate as much relevant information as possible.
The average interview lasted approximately twenty (20) minutes and was carried out at the case school. In addition, a pilot classroom observation was conducted once for each case school. The pilot observation study served two purposes: ensuring that the case school was appropriate for the current study and acquiring information to develop and refine the observation schedule. The pilot classroom observations were implemented throughout the whole lesson which was approximately forty-five (45) minutes long. In addition, one pilot group discussion of about twenty (20) minutes was carried out in each of the three case schools, aiming to ensure the practicality of the data instruments.

The pilot study was beneficial in different ways. Time management was refined for the three methods, for example in gauging how long the interview session in the main study would take to complete. Furthermore, a pilot study took place on each site, ensuring that the sample on each site was appropriate for the current study. In this regard, I conducted a meeting with two teachers and two students in order to obtain feedback on the clarity and relevance of the items in the interview and observation schedules, particularly regarding the thinking skills terminology used. In addition, the pilot study showed me the importance of triangulation in collecting data, in that it allowed me to have an initial understanding of the important points which emerged from different sources through a series of particular experiences related to the main study questions. Moreover, the major purpose of the pilot study was to refine the instruments and overall approach, not to glean findings.

The pilot influenced the final research in that it enabled the development of the research instruments as discussed in Chapter Three Section 3.6 and identified potential roles for each of the individual instruments. Moreover, throughout the pilot study, a preliminary attempt at analysis was made to identify initial data categories. These processes of data analysis started with the meeting between the researcher and the participants. Analysis of the interview, observation and group discussion helped to shape some early findings through grounded theory (GT). Through this phase of analysis, I transcribed the digital voice recorder, of the interviews and observations, following certain techniques such as primary reading of transcripts and writing notes. These were then translated into English. Thus the pilot study was an introductory stage for the main analysis, which improved my knowledge when dealing with the data collection and the data analysis in the main study.
4.3. Main Study

The main field study was conducted during the three months from 6th March to 18th June in the academic year 2009-2010, after the completion of the pilot field study and the selection of the seven cases. In this study, I used a strategy of inductive analysis by adopting grounded theory [GT] as the analysis technique that allowed themes to emerge from the data themselves. Interviews, classroom observation and group discussion data collection methods adopted in this study contributed further insights into the research data, as well as enhancing credibility by triangulation of the data.

There were seven case classes and three main instruments of data collection. To get a better understanding of the issues, the data from the three main instruments of data collection were analysed in order across all seven cases; and then two cases from the seven were selected for more thorough study. The focus was on events that occurred in the school day regarding the research questions, to yield a better understanding of the phenomena of the study. The operation of analyzing the data from the case studies was as follows (see Figure 4.1).

4.4. Data analysis

The qualitative data were analysed through an inductive approach, in which categories were derived from the data themselves and coding emerged from the data, according to the concept of constructivist grounded theory. Data collection and analysis occurred after I started my main study on 6 March 2010.

In this study, analysis of the data occurred in three stages, as will be discussed later. Interpretation in grounded theory is conditioned by what has been learned in the preceding round of data analysis (Warburton, 2005). Strauss and Corbin’s (1990) prescription for using GT for theory building was to use it to generate emergent theory. The analysis follows the basic coding sequence (Open ➔ Axial ➔ Selective) iteratively between primary data and the emerging theoretical framework (Warburton, 2005).
The rationale for using the grounded theory analytic process is based on the importance of integrating analysis with data collection within the current study. This approach normally entails moving back and forth between primary data collection and analysis, starting during the time in the field. Therefore, one of the main rationales for using grounded theory in data analysis was the generation of concepts of teaching and learning thinking skills operations based on ideas emerging from the data, such as the common factors of experience of teaching and learning thinking skills, and the main challenges perceived by teachers and students when they are teaching/learning thinking skills.

As mentioned earlier, the process of data analysis using grounded theory progressed during main study stages. The operation of data analysis follows the following stages (see Figure 4.1):

Stage one: “Open coding”, the process at this stage entailed inductive coding that emerged from the data including:

- Concepts: which involve coding the primary data;
- Categories: classifying and combining concepts into structures;
- Condensation of categories: condensation and merged categories into new concepts.
At this stage the basic coding sequences are grouped into categories, categorised, and then compared with each other iteratively, between primary and emerging data. This is carried out using each data collection method, gathering and building on the ideas of all data methods, and then recognising thematic topics. (See Table 4.4)

Stage two: “Axial coding” clarifies relationships between categories and uncovers consequences of those relationships inductively. This stage is inductive in that it attempts to yield understanding and interpretation of the research phenomena among the participants, as well as matching the experience of both teachers and students in related groups. (See Table 4.4)

Stage three: “Selective coding” discovered and combined the main categories which emerged throughout the data analysis. This stage was inductive in that it shaped an understanding of the relationship between the main categories, and categorised each theme together with other concepts in order to create a theoretical framework for the study as a whole. (See Table 4.4)

Through these stages, the organizing categories of analysis are largely derived from the data themselves. The analysis process, consequently, requires continual checking, incessant improvement of the findings and concepts and generation of a new list of codes. During the revision, I became aware of new codes that would reproduce the participants' experience of teaching and learning thinking skills that might be derived from all data collection methods. This re-examination of the data aims at making them more conceptual and reclassifies them into inclusive categories leading to themes based on their meaning.

As mentioned earlier, the data analysis process proceeded during the pilot study and main study stages, through use of the following procedures:

- Dividing the data’s ideas into discrete groups;
- Giving each a code number;
- Relating and matching each common idea with wider concepts;
- Classifying each wider concept with others;
- Selecting the main coding.

During data analysis, comparison of the data processes required moving back and forth among the data, continuously aiming for more insights regarding the research questions, and looking for more meaning within the data through the case studies. Table (4.4) is an outline of the whole data analysis processes.
4.5. Instruments of data collection and analytic approach for each

For each of the main tools, the following analytical approach was adopted:

a. Semi-structured interviews:

   a. The teachers' interview coding analysis: each of the seven case teachers was given a particular code during the coding analysis data process, as well as the number of interview and page and line numbers. For example (Case 3, Teach S, int2, p. 3 L.11-18).

   b. The students' interview coding analysis: each of the case students was given a particular code during the coding analysis data process, as well as the number of the interview and page and line numbers. For example (Case 6, St Mdevr, int 1, p.6 L. 11-14).

b. Classroom observations: 38 classroom observation lessons were carried out for all the seven cases. Each of the seven cases was given a particular code during the coding analysis data process, as well as the number of the classroom observations and page and line numbers. For example (Case 3, Class Ob 1, p. 1 L. 36-42).

c. Group discussion: in each case a group discussion was held with students. A particular code was given to each of the seven cases during the coding analysis data process, and the number of the group discussion as well page and line numbers. For example (Case 3, Group D 2, p. 3 L.12-15).

4.5.1. The teachers’ and students’ interview data analysis

15 Semi-structured interviews were conducted with the teachers throughout the main study stages in order to collect teachers’ experiences of teaching thinking skills in primary curricula in the KSA. The average interview lasted about forty (40) minutes and was carried out at the same case school. 28 semi-structured interviews were conducted during the main study in order to collect students’ experiences of learning thinking skills. The average interview lasted approximately thirty (30) minutes and was carried out at the case school. In addition, for both the teachers’ and students’ interview data analysis, the majority of interviews were implemented after the classroom observation to understand and confirm the data which were collected from the classroom observations and/or group discussion.
<table>
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<tr>
<th>Case</th>
<th>Number of pilot interviews</th>
<th>Number of main interviews</th>
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<td>Teacher interview</td>
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<tr>
<td>Total</td>
<td>2</td>
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</tbody>
</table>

Table 4.1: Numbers of interviews

The reason why some cases had more interviews than others was that, occasionally, further interviews were held to provide further evidence for the perspectives expressed. The teacher and student interaction, time available for the interview, and conditions of both the teacher and the school, were also factors here.

The different natures of these studies should be acknowledged in that they relate to different experiences, societies and cultural backgrounds. And, in light of some students’ lack of background knowledge regarding thinking skills, some had difficulty understanding the interview questions; however, those who had attended extra-curricular programmes had no such difficulty. In this regard, because the students’ interview schedules were first written in English, then translated into Arabic to be administered, and then the results translated back into English, I acknowledge that the students’ language may be more formal or adult-like than was actually the case.

During the main study, both teacher and student interviews were recorded using a digital voice recorder, then, after each interview, I transcribed the recording verbatim and checked the whole transcription in detail with the interviewee. This allowed attention to be paid to both pivotal and small details regarding teachers’ and students’ experiences in order to validate and cross-check the data. The data collected during the first teachers’ and students’ interviews revealed further themes that might be investigated in second interviews. This period was the first phase of data analysis, where “open coding” began to take shape and the formation of concepts started emerging from the data. An example of open coding was ‘a safe classroom atmosphere:'
importance and impact’ which emerged from the student interviews. This focussed my attention on the importance and impact of a safe classroom atmosphere on learning thinking skills, which led to the ‘safe classroom’ concept as one of the main themes of this study (see Table 4.4).

After all seven cases’ recordings had been transcribed, each case’s teacher and student interviews were coded in a way that derived from the data themselves, for example (Case 3, Teach S, Int 2). For example, from ‘a safe classroom atmosphere: importance and impact’ code, a more detailed code list was generated:

- Freedom;
  - Giving students the freedom to talk;
- Equality;
- The students’ views of the characteristics of the ideal safe environment for the building and development of thinking in the classroom.

Through this stage, a huge amount of data and corresponding first stage analysis across seven cases was created; this was one of the challenges which I faced in this study.

The second stage involved comparing grouped data, building the ideas into thematic categories, clarifying relationships between categories and then re-examining and selecting the main coding throughout all seven cases. For example, ‘a safe classroom atmosphere: importance and impact’ was an open coding which continued to emerge from the different cases from both teachers’ and students’ interviews. This led to a focus on relationships between categories and then a re-examination of the ideas into ‘a safe classroom atmosphere’ theme as axial coding. After that, these processes were a beginning for classifying cases into either traditional or progressive, through their common characteristics. During this stage, I became conscious of new codes that might be relevant to my aims, making them more conceptual of the participants’ experience of teaching and learning thinking skills. For example, the students used the terms “relationships and power” when explaining their experience of learning thinking skills operations. Thus the teachers’ and students’ interview data displayed insights into the teachers’ and students’ perceptions of teaching and learning thinking skills in the classroom. (See whole list of: ‘The overall themes from analysis of students' interviews’ in Appendix 5); and’ The overall themes from analysis of teachers’ interviews’ in Appendix (6) ).
Summary of the teachers’ and students’ interview analysis

The main ideas of the thematic topics of the teachers’ and students’ interview data analysis related to the experience of teaching thinking skills in the KSA context were identified as follows:

- Enjoyment of thinking skills
- Teacher’s preparation
- Strategies and techniques for teaching thinking skills
- The textbook exercises
- The perception of internal factors
- The perception of external factors
- A safe classroom atmosphere
- Extra-curricular programmes
- Teacher-inspired roles
- The relationship between teachers and students
- Appropriate classroom environment
- Teachers’ challenges
- Students’ challenges

Table (4.4) shows the overall plan of the teacher and student interview data analysis process, while explaining and interpreting the thematic topics in relation to the research questions will be undertaken in Chapter Five.

4.5.2. The classroom observation data analysis

The rationale for the classroom observation was to help me to delve into the teachers’ and students’ experience to help to discover whether there was something new which had not shown up in the interviews or group discussions, over an average of five classroom observations. The additional rationale for using classroom observation was to see how teaching and learning thinking skills were enacted in the actual situation. This observation was necessary to allow the observer to produce comprehensive, descriptive and recorded accounts of actual practice and interaction, to shed light on factors which promote or hinder the teaching and learning of thinking skills in the classroom context.

The observation schedule (see Appendix 8) and open-ended field notes were used for generating the data. Across the three month period of the case study, an average of five classroom observations was carried out for each case class. The classroom observations were implemented throughout the whole lesson.
which was approximately forty-five (45) minutes (for an example, see Appendix 11). The observation instrument was applied as this is the more appropriate technique for the theoretical framework of this study (see Chapter Three, Section: 3.3).

The classroom observation data analysis processes were completed for all seven cases, once near the beginning of my time in the classroom, once in the middle and once near the end. The aim was to get a picture of the whole story of the case as it built over time. I noted the process of teaching and learning thinking skills over this time span. These three observations helped to present a picture of the development of the teaching and learning thinking skills process in each class.

<table>
<thead>
<tr>
<th>Number of case</th>
<th>Numbers of pilot classroom observation</th>
<th>Numbers of main classroom observation</th>
</tr>
</thead>
<tbody>
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<td>(1)</td>
<td>1</td>
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<tr>
<td>Total</td>
<td>7</td>
<td>38</td>
</tr>
</tbody>
</table>

Table 4.2: Numbers of classroom observations

The table above summarizes the number of classroom observations. As mentioned earlier, the reason for observing different numbers of lessons in different case classes was because of the conditions of both the teacher and the school in terms of the case study timetable, richness of case information, and teacher and student interaction regarding the development of thinking skills in the classroom.

The initial data analysis procedures, such as coding and identifying early thematic topics, took place after each classroom observation, when the researcher checked in detail what was written in the ‘observation draft schedule’ and his notes. Consequently, the early data analysis stage of “open coding” began to take shape and the concepts started to be formed. For example, ‘collaborative learning’ is an example of open coding which emerged from the observation draft schedule and my notes. This focused attention on ‘the importance and impact of strategies for teaching and learning thinking skills’, and then formed ‘strategies for teaching and learning thinking skills’ as
axial coding of one of main experience themes of this study (See Table 4.4). Also, I sometimes returned to the video recording – every lesson was recorded - in order to cross-check and validate what I had written.

After all seven cases’ classroom observations were completed, every case’s classroom observation was coded, the coding being derived from the data themselves. For example, Case 3, Class Ob 1. Following this, the main ideas were identified from the ideas coded and then the main ideas generated a new list of codes. (See ‘The overall themes from analysis of classroom observation’ in Appendix 9). For example, ‘importance and impact of strategies for teaching and learning thinking skills’ coding generated a new codes list:

- Collaborative Learning
- Dialogue Strategies
- Higher-Level Questioning Strategies
- Giving enough time
- Scaffolding Strategies
- Cueing Strategies
- The use of the language of thinking throughout classroom
- Individual techniques

After that, the thematic topics, ‘the main ideas’, during the classroom observations were classified by their grouping content. Later, the similar wider content was used to create the main categories. So, coded and thematic topics were derived from teachers’ and students’ experience regarding teaching and learning thinking skills in the classroom.

As with the interview data analysis process, the second stage of the classroom observation data analysis process consisted of comparing the main ideas identified, building the ideas into thematic categories, illuminating the relationships between categories, then reviewing the main codings selected during all seven cases, with the assumption that new codes would emerge throughout this operation. An example is comparing the main ideas identified regarding ‘importance and impact of strategies for teaching and learning thinking’, leading to building the ideas that distinguish between traditional and progressive cases. The opportunity for developing thinking skills with collaborative learning - as one of codes listed above - was more effective than applying traditional strategies, which was observed as one of the main obstacles facing students in several cases. These processes of data analysis contributed to a more meaningful understanding of teaching and learning thinking skills in classrooms through all case studies.
Summary of classroom observation analysis

The main ideas of the thematic topics to emerge from the classroom observation data analysis, related to the experience of learning thinking skills in the KSA context, were identified as follows:

- Teachers’ preparation
- Strategies and techniques for teaching thinking skills
- The textbook exercises
- The perception of internal factors
- The perception of external factors
- A safe classroom atmosphere
- Extra-curricular programmes
- Teacher inspiring roles
- The relationship between teachers and students
- The appropriate classroom
- Teachers’ and students’ challenges

Table (4.4) shows the overall classroom observation data analysis process, while explaining and interpreting these thematic topics holistically, with illustrations related to the research questions, will be carried out in Chapter Five.

4.5.3. The group discussion data analysis

The third instrument of data collection was the group discussion. The main rationale for the group discussion was to achieve a deeper understanding of the students’ experience of learning thinking skills, revealing aspects which had not shown up in either the interviews or classroom observations.

During the main study, nine group discussions were conducted to collect students’ experiences of learning thinking skills. Each group discussion lasted approximately twenty five (25) minutes and was carried out in the case’s school. The majority of group discussions consisted of the whole case class’s students and me, while two cases consisted of just three students and me where the timetable did not permit all of the students to be present. The group discussion student samples for two cases were the same students I interviewed. Throughout the group discussions issues were raised which had emerged from my classroom observations and student interviews. The aim was to improve understanding of these issues.
<table>
<thead>
<tr>
<th>Number of case</th>
<th>Numbers of pilot group discussions</th>
<th>Numbers of main group discussions</th>
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<tr>
<td>Total</td>
<td>1</td>
<td>9</td>
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</tbody>
</table>

Table 4.3: Numbers of group discussions

The table above summarizes the number of group discussions for both pilot and main studies. As mentioned earlier for the interviews and classroom observations, the reason for the different numbers of group discussions was the richness of the students’ information and the conditions prevailing in the school.

After the group discussions were completed, a similar data analysis process as for the interviews and classroom observations was performed. The ideas were identified and coded, and thematic topics emerged. The main ideas were identified and compared, the ideas of thematic categories were built, and the relationships between categories were clarified. For example, ‘Extra-curricular programmes’ was an open coding which continuously emerged from the different cases from the students’ group discussions. This coding generated a new codes list:

- The students’ views of extra-curricular programmes: importance and impact.
  - Lead to novelty and being able to generalise;
  - Guidance framework;
  - Skills and capability;
  - Raise attainment of academic achievement;
  - Know how to evaluate answer / owning learning

This led on to a focus on relationships between categories regarding extra-curricular programmes and then re-examining the ideas on the importance and impact of extra-curricular programmes. (See ‘The overall themes from the group discussion’ in Appendix 7).
Summary of group discussions data analysis

The data obtained from the group discussions were formed on the ground of both the interview and classroom observation data analysis. The main ideas of the thematic topics emerging from the group discussions data analysis related to the experience of learning thinking skills in the KSA context have been identified as the following:

- Strategies and techniques for teaching thinking skills
- The textbook exercises
- The perception of internal factors
- The perception of external factors
- A safe classroom atmosphere
- Extra-curricular programmes
- Teacher inspiring roles
- The relationship between teachers and students
- Students’ challenges

Table (4.4) shows the overall plan of all the instruments used for the data analysis process: semi-structured interview, classroom observation, and group discussion. Explaining and interpreting these thematic topics holistically, with illustrations relating to the research questions will be undertaken in Chapter Five.
Table 4.4: The Whole Data Analysis Processes

<table>
<thead>
<tr>
<th>Stage one: open coding</th>
<th>Stage two: axial coding</th>
<th>Stage three: selective coding</th>
<th>The main research findings related to the research questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>The main ideas of the thematic topics of the teachers’ and students’ data analysis related to the experience of teaching and learning thinking skills in the KSA context</td>
<td>Grouping of ideas into similar content regarding teachers’ and students’ experience of teaching and learning thinking skills</td>
<td>Combined the main categories which drawing together the overarching thematic</td>
<td>Teachers embracing the infusion approach to thinking skills via textbooks</td>
</tr>
<tr>
<td>Personal view of thinking skills</td>
<td>Enjoyment of thinking skills</td>
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<td>Teachers embracing the infusion approach to thinking skills via textbooks</td>
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<tr>
<td>University preparation or not</td>
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<td>The effects of teachers’ and students’ identities on teachers’ and students’ performance of thinking skills.</td>
</tr>
<tr>
<td>‘The university preparation was just information and traditional theory’</td>
<td>Teachers’ preparation</td>
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<td>Professional training courses</td>
<td>Strategies and techniques for teaching thinking skills</td>
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<td>The effects of teachers’ and students’ identities on teachers’ and students’ performance of thinking skills.</td>
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<td>Giving enough time</td>
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<td>Scaffolding strategies</td>
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<td>Justification skills</td>
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<tr>
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<th>Stage two: axial coding</th>
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<td>33 The curriculum contains pictures and exercises that support the teacher in his task of developing thinking skills</td>
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<td>• Spiritual/cultural inner motivation.</td>
</tr>
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<td>36 Motivation</td>
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<td>42 Views of extra-curricular programmes: importance and impact</td>
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<td>43 Leading to novelty and the ability to generalise</td>
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<td>45 Raising academic achievement</td>
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<td>46 Know how to evaluate one's own answer / owning one's learning</td>
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<td>47 The teacher's view of his inspiring role</td>
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<td>Teachers' inspirational roles</td>
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</tr>
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<td>48 The teacher's roles (14 elements)</td>
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<td>49 The relationship between teachers and students</td>
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<td>The main perceived obstacles facing teachers:</td>
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<td>53 A lack of teacher experience in dealing with thinking skills</td>
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<td>1.1 A lack of professional training</td>
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<td>Stage one: open coding</td>
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<td>The main ideas of the thematic topics of the teachers' and students' data analysis related to the experience of teaching and learning thinking skills in the KSA context</td>
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<td>Combined the main categories which drawing together the overarching thematic</td>
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<td>A lack of adequate time for training</td>
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<td>✓</td>
<td>The main perceived obstacles facing students:</td>
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<td>An uncomfortable work environment</td>
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<td>Feeling teacher works alone</td>
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<tr>
<td>The teacher did not address thinking skills at the same time as dealing with the textbook's academic content</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A lack of advanced planning for the textbook exercises</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use of traditional methods and reasons for this</td>
<td>✓</td>
<td>✓</td>
<td>2.2 Power relations</td>
<td></td>
</tr>
<tr>
<td>The teacher moves exercises quickly</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
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<tr>
<td>Teacher does not explain the exercises</td>
<td>✓</td>
<td></td>
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<tr>
<td>A lack of opportunities for dialogue</td>
<td>✓</td>
<td></td>
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<tr>
<td>Working on the level of memorization</td>
<td>✓</td>
<td></td>
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</tr>
<tr>
<td>An unsafe classroom environment: &quot;The use of ridicule from some students&quot;</td>
<td>✓</td>
<td></td>
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<tr>
<td>Stage one: open coding</td>
<td>Stage two: axial coding</td>
<td>Stage three: selective coding</td>
<td>The main research findings related to the research questions</td>
<td></td>
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<td>------------------------</td>
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<tr>
<td>The main ideas of the thematic topics of the teachers’ and students’ data analysis related to the experience of teaching and learning thinking skills in the KSA context</td>
<td>Grouping of ideas into similar content regarding teachers’ and students’ experience of teaching and learning thinking skills</td>
<td>Combined the main categories which drawing together the overarching thematic</td>
<td>RQ3 Challenges</td>
<td></td>
</tr>
<tr>
<td>78 An unsafe classroom environment: “The use of ridicule from some students”</td>
<td>✔ ✔ ✔ ✔</td>
<td>2.2 Power relations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>79 A lack of group sympathy in the case of collaborative learning</td>
<td>✔ ✔</td>
<td></td>
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<tr>
<td>80 The sense of inequality</td>
<td>✔ ✔ ✔ ✔</td>
<td></td>
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<tr>
<td>81 Fear of the teacher: “Nervous teacher”</td>
<td>✔ ✔ ✔ ✔</td>
<td></td>
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<tr>
<td>82 Fear of ridicule from some students or teacher</td>
<td>✔ ✔</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>83 Weaknesses in literacy</td>
<td>✔ ✔ ✔</td>
<td>2.3 Weak student literacy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>84 The pressure and feeling of conflict with the heavy academic content of the textbook</td>
<td>✔ ✔</td>
<td>2.4 A lack of time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>85 Intensity of the academic content in the textbook and its pressure on the teacher</td>
<td>✔ ✔ ✔</td>
<td></td>
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<tr>
<td>86 Group pressure</td>
<td>✔ ✔ ✔ ✔</td>
<td></td>
<td></td>
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<tr>
<td>87 A lack of time available to solve exercises</td>
<td>✔ ✔</td>
<td></td>
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<tr>
<td>88 Difficulty understanding the exercise questions</td>
<td>✔ ✔</td>
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<td>89 The difficult terminology used in the questions</td>
<td>✔ ✔</td>
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<tr>
<td>90 A lack of understanding of some the vocabulary in the exercise questions</td>
<td>✔ ✔</td>
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<tr>
<td>91 A lack of familiarity with the exercises</td>
<td>✔ ✔</td>
<td></td>
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</tr>
<tr>
<td>92 The absence of examples and models for solutions within the exercises</td>
<td>✔ ✔</td>
<td>2.4 A lack of time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>93 The students’ pressure and feeling of conflict when dealing with thinking skills when they are integrated with the heavy academic content of the textbook</td>
<td>✔ ✔</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>94 In-depth questions in the textbook that were difficult for the teacher and that required advanced planning</td>
<td>✔ ✔</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>95 An uncomfortable school building: ‘Classes in rented buildings’</td>
<td>✔ ✔ ✔</td>
<td>2.4 A lack of time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>96 Lack of a suitable environment for developing thinking skills.</td>
<td>✔ ✔ ✔</td>
<td></td>
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</table>

Table 4.4: Main study data analysis stages

Int T: teacher interview; Int S: student interview; Ob: classroom observation; GD: group discussion.
4.6. Chapter summary

This chapter presented an overview of the analytic approach of the present study, including the pilot and main studies. The findings emerged from the data analysis by using grounded theory analysis techniques on the data collected by three instruments. The process of analyzing the data which were obtained from each instrument was explained and underlined. All stages of the analytic processes produced insights into teachers’ and students’ experiences of teaching and learning thinking skills in the KSA context.

Different levels of analysis were involved in recognising the three themes related to the research questions. Therefore, these were not really analytically-derived themes as such but, instead, deductively frame the analytic findings. These three main themes which were deeply embedded throughout the data analysis process, presented in the whole data analysis process table, were: experience, factors and challenges. In the following chapter, these thematic findings will be presented and discussed in relation to the research questions of the present study.
Chapter Five

Thematic Findings
5.1. Introduction

This chapter considers the analysis of the thematic findings from the interviews, classroom observations and group discussions. As mentioned in the previous chapter, the findings emerged from the data collected by the three instruments using grounded theory analysis techniques.

As argued in Chapter 4, the data analysis of this study was drawn together in a holistic way to try to provide a rounded perspective on teachers’ and students’ experience within the KSA primary curriculum context. The different levels of analysis revealed three main thematic findings related to the research questions (See Table 4.4), which were: experience, factors and challenges. The meaning of each of these is explained below:

- **Experience (Related to RQ1):** Actual classroom practice and application of thinking skills; interaction between teachers and students when working on thinking skills; and their reflections on the processes of developing thinking skills. This theme identifies five main sub-themes: enjoyment of thinking skills, teachers’ preparation, strategies and techniques for teaching thinking skills, students’ application of the thinking skills process and the textbook exercises (See Table 4.4).

- **Factors (Related to RQ2):** Influences impinging on teachers’ and students’ engagement with teaching and learning thinking skills in the classroom. This theme identifies two main sub-themes: the perception of internal factors and the perception of external factors. The external factors include: social and cultural factors, a safe classroom atmosphere, extra-curricular programmes, teachers’ inspirational roles, the relationship between teachers and students, and an appropriate classroom (See Table 4.4).

- **Challenges (Related to RQ3):** The main difficulties perceived by teachers and students. This theme identifies eight main sub-themes: lack of professional training, swimming against the stream, a lack of time (for teachers), the teacher as potentially one of the challenges, power relations, weak student literacy, a lack of time (for students), and the textbook’s challenges (See Table 4.4).
5.2. Experience: ‘The experiences of teachers and students of teaching and learning thinking skills (Related to RQ1)’

This section focuses on teachers’ and students’ experiences of teaching and learning thinking skills in the classroom. As will be seen, experiences were deeply embedded in the social context. These experiences were documented through the interviews, classroom observations and group discussions through all seven case schools. This section also offers a discussion of teachers’ and students’ views of thinking skills. In addition, it discusses the teachers’ preparation, whether at university or in-service training. Strategies and techniques for teaching thinking skills which were applied by the case teachers are presented. This is followed by the students’ application of thinking skills processes in the classroom. At the end of this section, the influences of the textbook exercises on teachers’ and students’ experiences of teaching and learning thinking skills in the KSA context are presented.

5.2.1. Enjoyment of thinking skills

Analysis of the lesson observations and interviews reveal that all teachers enjoyed teaching thinking skills through use of the school textbook. The majority of teachers believed that the inclusion of thinking skills in the school curriculum was important:

‘An essential part and the different levels of thinking should be embedded in the basics of education process.’ (Case 3, Teach R, Int1, p. 1 L. 27)

Also teachers showed awareness of the importance of thinking skills in different school subjects as well as in daily life:

‘I really, really care a lot for thinking skills - why? Because the curriculum will be lost. How? Because the student, after a month or two months, will forget the information, but the development of his thinking skills will stay and continue with the student.’ (Case 3, Teach S, Int1, p. 6 L.24-26)

Nearly all teachers addressed the development of thinking skills in their lessons, as noted during all lesson observations, in every case classroom. They did this through exercises, whether built into the textbook or invented by the teacher, which played a key role for many students to develop their thinking skills (see Appendix 1 as an example of an exercise). It was also found that one of the teachers believed that he could apply the development of thinking
skills in his lesson without knowing the vocabulary or philosophy of thinking skills.

In most cases, teachers (3, 4, 6 and 7) dealt with thinking skills at the same time as dealing with the textbook’s academic content. Similarly, lesson observations showed that teachers encouraged students to tackle the exercises by explaining the importance of thinking skills in their academic achievement and future success. Another significant aspect pointed out was that teachers viewed thinking skills as one of the best ways to develop students’ abilities, and that this gave the teacher a heavy responsibility. For example, one teacher had a positive view of his students in that he was optimistic and had confidence in their ability: ‘Students are creators; ‘Once the student’s thinking starts flowing, the student doesn’t stop!’ Consequently, he wanted to develop his students’ skills by applying a wide range of strategies and techniques for teaching thinking skills throughout his lessons.

5.2.1.1. A ‘dynamic educational incubator’

Three teachers believed the thinking skills process to be one of construction. Another believed that teaching thinking skills was a ‘dynamic educational incubator’ and that it represented an essential step towards improving and integrating the school curriculum:

‘It is a wonderful, valuable rich skills... assuming that an educational incubator - such as the school curriculum, teachers and instructional methods - all must be built on thinking skills, so that there is an integration.’ (Case 7, Teach N, Int4, p. 3 L.13-18)

Regarding this last point, thinking skills in the curriculum had been built upon by adopting an infusion approach, applying a wide range of strategies and techniques for teaching thinking skills throughout the lessons. This was seen as a construction process because teachers collaborated amongst themselves to develop and complete the abilities and thinking skills of students. For example, one teacher would begin to develop a particular thinking skill in his lesson, which was then built upon and completed in the following lesson, whether in the same subject or a different one, with a second teacher. In this regard, the teacher believed that teaching thinking skills is a ‘dynamic educational incubator’.
5.2.1.2. Students’ Views

Students’ knowledge of, and attitudes towards, the thinking skills process was obtained from student interviews, lesson observations and group discussions. These indicated that students enjoyed dealing with such strategies in the textbook. Seventeen students were asked questions about their attitudes towards the thinking skills process. They reported that they ‘sure’ enjoyed it when dealing with the thinking exercises, because they ‘invented new steps, new situations, new ideas’, so everything became new. An exception was one student who said he found it difficult and he did not enjoy it, as will be discussed later.

About half of the student interviewees had some knowledge of thinking skills; most of them claiming that they had learned this from the extra-curricular programmes which had been provided in some case schools. When compared to other cases where the school had not provided extra-curricular programmes, it was found that the background of thinking skills was almost non-existent. For example, two students who were asked the meaning of thinking skills said: ‘I don’t know’, ‘I’ve never heard of it’; while two others said that no one in their community, home or even school, had discussed the subject of thinking skills with them. The extra-curricular programmes will be further discussed later, as will the students’ experiences in dealing with the exercises.

5.2.2. Teachers’ preparation

5.2.2.1. ‘The university preparation was just information and traditional theory’

The findings of the teachers’ interviews signify that all teachers believed that their university preparation had been inadequate for the learning and teaching of thinking skills, and that the university preparation had been ‘just information and traditional theory’ (Case 4, Teach R, int1, p. 1 L. 16). Some teachers had ‘dealt with the theory by memorizing it’ (Case 1, Teach A, int1, p. 1 L. 6), one saying that ‘I retained it only until the exam’. Others had ‘not taken anything about the teaching of thinking skills at university’ (Case 5, Teach M, int1, p. 1 L. 8).
It was evident, however, from both the teachers’ interviews and classroom observations, that professional in-service training courses were the single most important factor in a teacher’s development. Not only did they help teachers deal with thinking skills, but they also engendered a positive attitude to the thinking skills process which encouraged teachers to apply it in class. The majority of teachers insisted that such professional training courses were invaluable in filling the gaps in their university education.

Another important aspect pointed out by teachers was that teachers who had participated in in-service development, whether presented by the Ministry of Education, with some reservation by some teachers, or through private professional training courses which were normally paid for by the teachers themselves. All these teachers emphasised the significance of developing teachers’ skills and the need for continued in-service training.

Regarding the in-service training presented by the local Ministry of Education, in accordance with the ‘Plan of training programmes for the second term, 2009-2010’, there were 308 short courses that covered the majority of school subjects, and covered pedagogy, classroom management, ICT and so on (See appendix 10).

The majority of teachers believed that their learning on professional training courses was reflected in their classroom performance. They emphasised that such courses had a positive influence in developing their professional competence and promoting their interest in developing their students’ thinking skills. In particular, these courses improved their attitudes to, and understanding of, thinking skills; they helped in their lesson planning, teaching strategies and techniques; and it was especially useful to be able to discuss their difficulties with colleagues.

Lesson observations revealed that teachers who had participated in in-service development showed this in their practice. Teacher F, for example, as a trainer of skills development, used his own exercises and used the language of thinking. He often spoke to students about the importance of developing their thinking skills. He also encouraged the use of thinking language by explaining the meaning of certain thinking skills, such as creative drawing skills, by explaining their importance and role in developing understanding; he then gave examples of it (Case 6, Class Ob 1, p. 1 L. 39 - 43). Moreover, he regularly used a variety of appropriate techniques and strategies for teaching and learning thinking skills, such as scaffolding, cueing, giving enough time and giving feedback.
When compared to the teachers who had participated in in-service development, two teachers who had not taken any courses regarding thinking skills taught their lessons in a more traditional manner. Perhaps the most prominent finding was that knowledge obtained at in-service development created a huge difference among teachers concerning the importance of thinking skills in different school subjects as well as in daily life. The difference was manifested in encouraging students to tackle the exercises, explaining the importance of thinking skills in students’ academic achievement and future success, and being willing to deal with thinking skills at the same time as dealing with the textbook’s academic content.

Those teachers without any training in thinking skills made their shortcomings painfully clear during lesson observations. During one lesson, the teacher went through four exercises in just seven minutes. He started reading the first exercise, and at the same time answered the questions without giving students an opportunity to solve them or even to understand what they were all about (Case 2, Class Ob 3, p. 3 L. 41- p. 4 L. 3). Another teacher (case 5) did not address thinking skills alongside the textbook’s academic content, moved quickly from one exercise to the next, and had obviously not planned in advance for dealing with the exercises (Case 5, Class Ob 3, p. 5 L. 5- 9).

5.2.3. Strategies and techniques for teaching and learning thinking skills

The key concept from the socio-cultural perspective relevant to this study is that of ‘mediation’. Mediation can be viewed, in general, as the dynamic interactive mental process between peers or between the teacher and students (McGregor, 2007). Therefore, some feature of the strategies and techniques for teaching and learning thinking skills can be seen as kinds of mediation. The lesson observations and interviews showed that the majority of teachers consistently applied a wide range of strategies and techniques for teaching thinking skills throughout the lessons.

In the main teachers used the following strategies and techniques: collaborative learning, dialogue, higher-level questions, scaffolding, cueing, giving enough time, the use of the language of thinking, feedback, and other individual techniques.
5.2.3.1. Collaborative Learning

During lesson observations, it was noted that the strategy of collaborative learning for teaching and learning thinking skills was used in the majority of cases. Collaborative learning could be described as ‘a philosophy of interaction … where individuals are responsible for their actions, including learning, and respecting the abilities and contributions of their peers’ (Panitz, 1996). In addition, Dillenbourg (1999: 13) argued that collaborative learning ‘generates interaction patterns; these interactions trigger cognitive mechanisms which in turn generate cognitive effects’. The socio-cultural perspective focuses on the importance of dynamic interactive exchange through collaborative learning in order to develop students’ cognitive abilities.

In these collaborative teaching methods, students worked in small groups or pairs for developing their thinking skills and collecting their ideas together by dialogue and inquiry. Through one entire observed lesson, the teacher used collaborative learning as the main method. ... I noted that there was vitality and interaction when the teachers used collaborative learning in that each group looked like a workshop with students discussing the answer to the teacher’s question and being critical of answers provided by other members of the group (Case 1, Class Ob 1, p. 1 L. 12 - 17).

All teachers were asked questions about the collaborative strategy in teaching thinking skills. The majority of the teachers thought it was helpful to the development of students’ thinking skills; most believed in creating a balance between individual learning and a collaborative strategy.

Similarly, it was also suggested that collaborative learning represented an effective means for developing students’ thinking skills, one of the teachers elaborating:

‘Yes, there is an advantage in the collaborative method; there are benefits for the growth of students’ skills. I regularly noted that many skills, such as criticism, for example, within the group - one of the students mentions the answer and other says another answer, then a third says what the answer will be as well. So, there is collaboration, for example, in solving or correcting the answer, and so on. I usually note that there are sharp debates within the group, then one answers’. (Case 7, Teach N, int1, p. 8 L. 15-19)

Other important advantage, one teacher believed, was that collaborative learning could help students of lower ability to gain a more positive attitude to the thinking skills process and to academic achievement:
‘Another of the positive things is that some students are not interested in the academic way, but they find collaboration develops a love of learning, developing how to get information, and discussion.’ (Case 7, Teach N, int1, p. 8 L. 15-21)

5.2.3.1.1. ‘The best’

In the interviews, the students reported that collaborative learning was ‘the best’ way to develop thinking skills, as they had all had experience of both collaborative and individualized learning, usually based on the traditional method.

‘Collaborative learning is the best. It encourages me more; also, working with a group is easier than working alone.’ (Case 2, St Khamais, Int 1, p.3 L. 18 - 19)

‘I love collaborative learning; the communication between me and other students gets better and better. Also I understand my colleagues and the lesson in a larger way.’ (Case 6, St Trbag, Int 1, p.3 L. 31 – 33)

Some students thought that collaborative learning allowed them to be more responsive and was more motivating. Where ‘individual learning has more recitation’, collaborative learning was ‘active without any problem’, such as the 'hesitation' which affected some in individual learning. Similarly, one of the students saw collaborative learning as ‘easier’ than working alone as it ‘encourages’ him to be a more active student. Another student compared collaborative and individual learning by describing the latter as 'limited' whereas he would not ‘hesitate’ to criticize his colleague’s answer in collaborative learning, and they would discuss it until they reached a satisfactory conclusion.

One student argued that collaborative learning was vital in allowing students to be more dynamic throughout the thinking skills process:

‘The collaborative learning style is so wonderful! It gets rid of boredom, and there is collaboration between the weak and excellent students, and this technique develops my thinking. … and I will benefit from those skills in the future. While the teacher who depends on the style of explanation, he does not develop my mind, and his methods cause me frustration and then absent-mindedness.’(Case 7, St Hammoudi, Int 1, p.2 L. 9 - 14)

These opinions were confirmed during lesson observations, where it was noted that, when working collaboratively, all students in all case classes
worked interactively on the textbook exercises and often made use of a long series of thinking skills.

The group discussions added further weight to this finding:

_Researcher_: How has collaborative learning affected you when dealing with thinking skills?  
_Student (Ali)_: Collaborative learning encourages me to think. … I mean the collaborative learning encourages me to think more and more.  
_Student (Mohammed)_: Collaborative learning is the best because we think together and the quality of the answer will be better.  
_Student (Salman)_: If I don’t know, or don’t understand the question, my group help me to understand and then find out the answer. (Case 2, Group D 1, p. 1 L.23-33)

_Student (Alaa)_: I prefer the collective learning of the group where I help them and they help me. I mean, if the question is difficult we answer it together… . I think about the previous information and I try to produce a link between the new and future information, and then we discuss it with the group. (Case 1, Group D 1, p. 2 L.5-14)

In these responses there were matches between the teachers’ and students’ experience of the effectiveness of collaborative learning.

Collaboration was combined with competition when the teacher divided them into groups and gave each group its own evaluation. This acted as a stimulus to motivate the development of students’ thinking skills as I observed:

‘Students who study with me, in that we adopt collaborative learning, where there is competition between groups.’(Case 6, St Trbag, Int 1, p. 2 L. 27-31)

Another advantage of collaborative learning is that it gets students to think of their own answers and about different possible answers, which makes use of a wide range of thinking skills as I observed.

Findings from all three research instruments show that collaborative learning has a huge influence when dealing with thinking skills, in that it allows students to benefit from each other and collect their ideas together by dialogue. This suggests the importance of the inclusion of collaborative learning as the main method when teaching and learning thinking skills in the classroom.

However, some weaknesses of collaborative learning which occurred in the teaching and learning of thinking skills were:
(a) Weakness in literacy among lower ability students;
(b) Aspects of power relations among students in terms of difficulty in joining with other group members;
(c) A lack of time to complete the lesson, showing that time needs to be managed carefully in collaborative learning.

An example:

'First feature of power: insulting the students in front of the teacher; second feature of power, ridicule. He ridicules any student making fun of him during collaborative learning, like you say... I feel frustrated... I cannot think... .' (Case 3, St Mazide, Int 1, p.6 L. 5 - 15)

5.2.3.2. Dialogue strategies

A review of the literature indicates that there are various interpretations of the dialogic concept. According to Wegerif (2002: 37), dialogue is: "shared enquiry... informed by more than one voice or perspective". Organizing instruction dialogically is "based on a different kind of relationship between teacher and students, in which students are asked to think, not simply to remember" (Skidmore, 2006: 504). Alexander (2008) describes the principles of dialogic teaching as collective, reciprocal, supportive; cumulative and purposeful.

The strategy of dialogue is one of the most important methods when dealing with thinking skills whether it is between teacher and student, student and student, or teacher and group. During lesson observations, it was noted that all cases used dialogue, whether throughout the whole, or just part, of the lesson. Case 3 was a great example of applying dialogue in the classroom, and this approach created an excellent condition for developing students' thinking skills, as will be discussed in the next chapter.

When teachers were asked about the influence of dialogue during their interviews, six out of seven said that dialogue was the best method for developing their students’ thinking skills, and some of the teachers 'often' used or 'adopted' the dialogue strategy in their classes.

The students, when interviewed, appreciated the dialogue between themselves and the teacher:
‘Dialogue has a major impact on the development of my thinking skills, because the interaction between me and the teacher will be more, and I move out from just being a recipient being both a recipient and contributor and I give the teacher my opinion. In some of the lessons the way of teaching was changed.’ (Case 6, St Trbag, Int 1, p.3 L. 9 - 11)

Another interesting aspect that emerged after the implementation of dialogue occurred was that dialogue had impact for both teachers and students.

Dialogue helped students to be very open-minded:

‘I believe that dialogue is the best way to develop thinking skills; the student will be very, very open-minded… ’ (Case 3, Teach S, int1, p. 12, L. 27- 28)

One of the teachers indicated that he used the strategy of dialogue because 'the students loved dialogue'. Likewise, one student argued:

‘I love to learn these exercises in the classroom with a dialogue to encourage and develop thinking skills.’ (Case 5, St Baradi, int 2, p.5 L. 1- 5)

One teacher believed that applying dialogue had 'contributed to developing thought'; similarly, one student indicated that:

‘Dialogue is a powerful assistant to the development of my thinking skills. ... Dialogue develops some skills such critical thinking and creativity.’ (Case 3, St Ayah, Int 1, p.9 L. 25 - p.10 L. 10)

All these findings confirm the view that dynamic interactive dialogue between teacher and students assists the development of thinking skills.

The characteristics of dialogic strategies include the purposeful use of questioning ‘asked to think’; reciprocity between teacher and student or with other students; support from students and teacher in order to guide the learner.

Yet, there were disadvantages reported by teachers in applying dialogic strategies, such as the additional time needed when compared with traditional methods, the difficulty in dividing time fairly between lower versus higher ability students; and the possibility of deviating from the subject of the lesson.

Consequently, the application of dialogue strategies needs careful organization and advanced preparation by the teacher. They need to identify the thinking skills on which they will focus during the teaching
process and, as some of the teachers pointed out, not all teachers are able to achieve this.

5.2.3.3. Higher-Level questioning strategies

Asking or answering higher-level questions was shown to be important in encouraging the best opportunities for the growth and development of thinking skills. A higher-level question, or ‘thoughtful question’, is ‘a question that stimulates or encourages student thinking beyond the level of recall or translation’ (Beyer, 1997: 30).

This importance is clear from a number of examples, particularly case 3. In all my observations in case 3 I noticed higher-level questions coming from the students. These questions involved mediation between several thinking skills. For example, throughout case 3’s lesson observations, the teacher encouraged students to ask higher-level questions, answered them, listened for the students’ ideas and negotiated with them. Also, the teacher created his own questions or led the students in waves of questions. I counted more than twelve main questions which came from the students themselves, and the teacher used these questions to explain the contents of the textbook. The teacher started his lesson by asking students to create their own questions about the lesson topic, followed by asking for answers to these questions, and prompting students to develop or criticise these questions (Case 3, Class Ob 1, p. 1 L. 36 42).

In a similar way, higher-level questioning by the teacher was used as a starting point from which to explain the contents of the textbook. This was noted during one of the lesson observations where the teacher asked several questions throughout the lesson. He used more than eight main questions as such starting points, from either the student textbook or student activities in the textbook. Some of them were classified as thinking skills questions. For example, under the title ‘Explore’ on page 6 in the student activities textbook, the main question was: ‘What causes day and night?’ The teacher focused more on question number 4: ‘Create a hypothesis; why is there alternating day and night? Write two hypotheses which you can test’ (Case 1, Class Ob1, p. 1 L. 44 - p. 2 L. 5).
One of the teachers explained that his aim in using higher-level questions was to stimulate the movement of the students’ minds and raise their level of thinking:

‘My view is that when I ask the student many, many questions, I’m sharing the movement of his mind. If I begin to send, and send only without dialogue, the student will be tired and his ability in thinking skills will not grow.’ (Case 3, Teach S, int1, p. 12, L. 20 -24)

One of the teachers used higher-order questions to encourage students’ creativity; he believed that ‘successful lives are the creative ones’. So he believed that:

‘It’s necessary to let students go into a series of creative activities and develop their thinking skills; so I use higher-order questions and answers, which I feel will open the students’ minds.’ (Case 4, Teach S, int1, p. 6 L.6-10)

It is interesting to note the influence on students over time as they became used to being asked higher order questions. Teachers compared students in their first year, who wanted traditional teaching methods, and the same students later on when they had become accustomed to asking and being asked higher-order thinking questions. One teacher who was applying higher-order questioning remarked that such questions were helping the growth of the students’ thinking by equipping them with new methods of finding and developing information. A number of skills were enhanced, such as ‘comparison, critical thinking and distinguishing too many things,’ so much so that the students started to criticize the teacher himself! Whilst in the first year students did not criticize, they subsequently gained more confidence by applying their thinking skills to the extent that they found they could ‘expand their comprehension skills and develop their thinking and make their presence and importance known.’

Consequently, the influence was that:

‘They began to ask many questions in the classroom, until sometimes large amounts of time in the lesson goes because of, students’ questions, in terms of many questions and many inquiries.’ (Case 1, Teach A, int2, p. 3 L. 13-19)

Indeed, findings emerging from the group discussion indicated that some students had come to distinguish between types of teachers in terms of their use of higher-level questions. This showed the influence of opening the door to questions on developing the abilities of students, rather than being mere recipients of the textbook contents:
**Student (Said):** There are 3 types of teachers. One teacher represses my thinking skills because he does not open the door to any questions. ... I never benefit, I am only just a copier and the recipient of information. The second teacher sometimes leaves my way to work out the answer and thinking, but sometimes not; so, sometimes I’m happy, while, sometimes I’m not. ... The third type of teacher is one who helps me in everything, does not hit, allows me to ask any questions without feeling nervous and this develops my thinking skills. ...  

**Student (Shraideh):** There is one teacher who asks questions all the time and then my mind unfolds, in contrast to another teacher who is fighting questions, and my mind starts closing slowly. (Case 3, Group D 1, p. 2 L.3-17)

In the same regard, two students in case 3 whom I noticed always asked strong questions and made good assumptions, were asked numerous questions during their interviews about the impact of asking the teacher high-level questions and where they thought their questions came from.

One of students, when interviewed, emphasised that ‘the teacher’s method of explaining the subject’ by applying higher-order questioning helped him to develop clear thinking. By developing his own evaluation skills, he could then evaluate his colleagues’ answers and thereby develop his own learning.

‘The student asks, and I wait and look for his questions and choose the best and I develop it and ask it out loud.’ (Case 3, St Ayyaf, Int 1, p.2 L. 16 - 18)

This student also believed that allowing questions during the lesson had the beneficial influence of allowing him ‘to quickly understand’, particularly as the teacher ‘provides enough time in the lesson to allow us to ask questions.’ This point will be further discussed in the ‘Case Studies’ Chapter.

Another interesting finding emerging from the classroom observations was that higher-level questioning encouraged students to formulate their own questions. The issue of allowing students the ‘freedom to ask any question’ is clearly relevant here, and will be further discussed under the importance of a safe classroom environment. An associated issue is that of the teacher refraining from criticising students’ answers.

‘The teacher Sale says I have all the answers right. For example, if my colleague’s answer is not complete, he says that this is true, and if another colleague’s answer is better than the first, he says this is better, and he says that both are correct. ... If there is a question I do not hesitate to answer; I immediately answer and this gives me the comfort and freedom to say what comes in my mind. Also it contributes to my thinking and I do not stop.’ (Case 3, St Ayyaf, int 1, p.4 L. 17 - 27)
Supporting this finding during lesson observations, it was noted that the teacher never said that the answer was wrong. On the contrary, he said many times ‘beautiful answering but we need more than beautiful’, or sometimes he said ‘grateful, excellent, wonderful’. This response encouraged students to continue thinking, as with ‘Muath’, who, when he was trying to think, said ‘a a a’, bit his lips and hit his chin slowly with his finger (Case 3, Class Ob 1, p. 1 L. 36-42).

5.2.3.4. Scaffolding strategies

Scaffolding is the temporary pedagogical structure that supports students in addressing the cognitive task that they might not be able to do alone. The importance of using scaffolding as one of the strategies for teaching and learning thinking skills was shown especially in cases 3 and 6 where the teacher used particular symbols to develop students’ understanding and thinking skills, such as classification, justification or elicitation.

Lesson observations of case 3 revealed that the teacher used his ‘five rules strategy’ as scaffolding and this formed the main aspect of mediation. The ‘five rules’ were shaped via interaction and participation in social practices within the social and cultural context and in relationship with others. Here there was interaction between the teacher, as one of the sides of the mediational triangle, his students as the second side of this triangle, and the jurisprudence textbook within the KSA curriculum which formed the third side of the triangle. The teacher, by the scaffolding (five rules: obligatory, desirable, permitted, prohibited, and abominable), enabled a ‘bridging’, which helped to define and to understand the learners’ immediate thinking skills needs. In addition, the teacher aimed to give his students a wide set of dynamic rules that would continue with them and through which they would be able to identify and conceptualise many new situations which they would face later in their lives. By training the students, as this teacher was doing, they would be enabled to work out which Islamic rulings were expected in novel situations. These five rules will be explained later in the Chapter of ‘Case Studies’.

The teacher explained his ‘five rules strategy’ to develop students’ thinking skills:

‘These five rules develop thinking skills as the student has a system which is these five rules. If he faces anything regarding Islamic law he will immediately be thinking and saying “Where does that fit?” And he starts trying to classify
what he knows about it, automatically like programming - in terms of the student's brain - like a computer. For example, theft is prohibited, as it is under the category of prohibited and so on; this is what I think about it." (Case 3, Teach S, Int1, p. 4, L. 30 - p. 5, L.3).

Thus the teacher believed that, as a consequence, using the 'five rules strategy' during teaching would have a beneficial influence on students’ learning skills. One particular case occurred during a class observation:

'In the story we had just read, the student thought, he wants to perform Hajj "the pilgrimage to Mecca" I didn't reply, I just transmitted the answer to the other students. He made two deductions, starting from the five rules which we have studied together. The student said that if he wants to do so and so the solution is such and such, while if he wants so and so, in this case, the situation will be such and such. So, the student activated his mind.' (Case 3, Teach S, Int2, p. 8 L. 1-18)

Supporting this finding related to scaffolding, in the group discussion, some students showed the influence of the five rules and cueing strategy (to be discussed later) which some teachers had used:

**Student (Ayyaf):** At the beginning of this year, I understood less, but then I started to quickly understand the differences between the rules and then I quickly understood.

**Student (Mazide):** Now we have become accustomed to the five rules, the teacher Saleh allocates 5 or 10 minutes each lesson to teaching thinking skills, like this written on the blackboard. He does not answer the questions and say "no" stop thinking and if you stop I will directly write the similarities between the rules. So, he does not answer, we answer. (Case 3, Group D 2, p. 2 L.33-41)

5.2.3.5.Cueing strategies

Cueing is 'a prompt that reminds one of what to do or say next'(Beyer, 1997: 205). It is a mediation interaction which mediates among teaching and learning thinking skills in the classroom. The importance of using cueing was shown when students were not able to answer the question because they did not understand what it was asking exactly. When a teacher used cueing, by giving a key word in the answer, the students were able to begin answering the exercise. This was clearly shown in many cases, such as cases 6 and 7, where giving a model answer or example helped students achieve a solution.

As an example of this, I noticed that, when comparing the teacher's own exercises and the textbook exercises, some of the teacher's own exercises had key words or cueing, which made them easier, while the textbook exercises
did not have key words or cueing, making them difficult for some students. The teacher provided keywords and wrote model answers. When I asked students about the influence of this, they said that it was very helpful for understanding what they should be doing, for reaching the desired answer and then for developing their thinking skills (Case 6, Class Ob 3, p. 7 L. 26 - 31). The impact of using cueing as a strategy of teaching and learning thinking skills in the classroom illustrated how mediated interactions influence the development of thinking skills.

Findings related to cueing strategies from the teachers’ interviews indicated that cueing was used when the teacher presented exercises and/or asked higher-level questions, aimed at the development of student thinking. Such cueing strategies allow students to generate new information out of previously known examples relevant to the lesson topic.

One of the important findings that emerged during the student interviews was that teachers’ use of cueing had a helpful influence on them:

‘While you prepared our lesson, when the teacher (F) used cueing ‘assistance words’, this way I liked it. It facilitates my understanding of the question in a good way, looking for the vocabulary and structure of a sentence, and conjures up information about this word, meaning that this way facilitated my understanding significantly.’(Case 6, St Mdevr, Int 3, p.6 L. 10 - 14)

The lesson observations supported this finding, as when cueing was used by the teacher presenting exercises two and five. He wrote both exercises on the blackboard, and then drew a small box at the corner of the board containing the key word for each answer. The students used this to start to answer the exercise. This cueing was helpful to students when dealing with the thinking skills activity (Case 6, Class Ob 2, p. 6 L. 1 - 5).

5.2.3.6. Giving enough time

The majority of teachers, in their interviews, realised that the development of the thinking process took time, and this contrasted especially with the normal method of ‘memorization’. They therefore allowed extra time for students to reach their answers.

This was confirmed in the classroom observations. In case 4, for instance, one of the exercises was a bit difficult, the time had finished and none of the groups had reached an answer, but when the teacher gave the students extra
time one of the groups was able to answer the question. In case 3, one of the students asked a very high level question, so the teacher, as usual, asked the students: 'Who can answer this good question?' I counted more then ten attempts until one managed to answer it. Another example occurred when the teacher saw students raising their hands to answer a question too quickly, and the teacher said: 'Be patient, give your colleagues a chance to answer, give them more time' (Case 3, Class Ob 3, p. 9 L. 21-29).

Interviews with students corroborated this:

‘Yes, and if the teacher gives me enough time, it will help to develop my skills more.’ (Case 6, St Nassar, Int 1, p.3 L. 7 - 10)

5.2.3.7. The use of the language of thinking in the classroom

The use of language is significant in the socio-cultural perspective in terms of inter- and intra-mental processes as mediating ideas (See Chapter Three, Section 3. 3). Here, the focus will be on the use of a specific vocabulary of thinking in the classroom context as a piece of inner speech, part of the mediation perspective. The importance of students acquiring a specific vocabulary of thinking is that it will help in understanding their own thinking and that of others, as well as recognising technical terms for elements of thinking processes, such as ‘alternative’, ‘critical’ or ‘summarise’, in the textbook exercises.

What was found was that the use of the language of thinking in the classroom had a positive influence on students’ motivation to develop their thinking skills:

‘One of the main motives in developing my thinking skills is the teacher stimulates thinking by repeating the word "think".’ (Case 3, St Ayyaf, int 1, p.7 L. 8 - 10)

Supporting this finding during lesson observations, it was noted that the teacher explained the meanings of some thinking skills terms: The teacher ... often spoke about the importance of developing their thinking skills. He also encouraged the use of thinking language by explaining the meaning of certain thinking skills, like creative drawing skills, by explaining their importance, and role in developing understanding; he then gave examples of it (Case 6, Class Ob 1, p. 1 L. 39 - 43).
Moreover, sometimes another teacher encouraged the use of the terminology of thinking skills in the classroom in his emphasis on the potential usefulness of thinking skills in different aspects of their lives: The teacher ... talked more than once about the importance of developing students' thinking skills as this would help them in different aspects of their lives. He also encouraged the use of thinking language by explaining the meanings of some thinking skills terms like ‘comparing’ and ‘creativity’. In this connection, twice the teacher asked students to imagine situations where some assumptions were made and to give a justification for a subject (Case 3, Class Ob 3, p. 8 L.23-29).

By contrast, one of the main perceived challenges facing teachers and students when teaching/learning thinking skills was found to be a lack of understanding of the language of thinking as I will mention later in the Challenges’ section.

5.2.3.8. Feedback strategies

Feedback strategies engage students over the main points and articulate the cognitive operations which were executed. The importance of using feedback, as one of the strategies for teaching and learning thinking skills, was shown sometime after the students had presented their answers, when they were not able to answer the question because they did not understand what it was asking or there was a lack of time. When the teacher gave feedback by presenting the answer, the students were able to begin to understand the exercise.

During the teachers’ interviews, it was found that some teachers regularly gave feedback when students worked in groups or pairs for developing their thinking skills and collecting their ideas together. The giving of feedback was noted during lesson observations. In case 1, after the students had presented their answers the teacher read their answers and gave all five groups feedback and told them their scores (Case 1, Class Ob 2, p. 3 L. 35-37). And in case 7, written feedback was given on the blackboard. After each exercise, a student was nominated by each group to read their answer in front of the class. Then the teacher provided feedback or asked other groups to assess that group’s answer, writing the answer in the table that was already drawn on the blackboard (Case 7, Class Ob 2, p. 5 L.6-10).

The importance of this feedback occurred through reinforcement, or by giving them a vocabulary in the teacher prompting students to recall the major steps
they had just been through and articulating a procedure for carrying out the relevant cognitive operation that they could use in their thinking skills processes.

5.2.3.9. Individual strategies

Throughout the case studies, some teachers created their own techniques in order to develop students’ thinking skills. One of these was making brochures or what is called the ‘table of self-assessment’ was one of the techniques for teaching and learning thinking skills in the textbook. Many students undertaking this exercise, whether directly from the textbook or as part of a ‘strategy for thought’ from the textbook or as invented by the teacher, found that it played a key role in developing their thinking skills.

Case 6’s teacher had used an activity based on the table. In the textbook the table contained three parts, but the teacher had added an extra part. The first was entitled ‘What do I know?’ eliciting the previous information on the subject which the teacher had explained, followed by ‘What have I learned from the teacher?’, then ‘The questions that pass through my mind’ and finally ‘What do I want to know too?’

According to the case 6 teachers, the exercise of the table of self-assessment facilitated putting the teaching of thinking skills into practice in the classroom, enhanced the students’ self-confidence and promoted their creativity.

Six students believed that the use of brochures as a technique for learning thinking skills made a useful contribution to the development of their thinking skills, as it aided their confidence, their ability to search for information independently, and their understanding through making connections between bits of information, thereby raising their academic level.

‘This method made me understand and I developed my skills in thinking; it also raised my academic level.’ (Case 6, St Nassar, Int 2, p.2 L. 19 - 22)

**Student (Mdevr):** It urged me to search for information, and the information that I had not focused on, it motivates me to focus more upon it.

**Student (Ali):** The self-assessment schedule urged me to learn by myself.

**Student (Mohammed):** The self-assessment schedule helps to connect the information. (Case 6, Group D 1, p. 1 L.17-24)
This technique could be transferred to other situations:

**Student (Twajiri):** This is a Matrix Standard ‘brochures’ and it helps me to understand.... I understood more. After answering the exercises I understood most of the content ... I think I’ll transfer the idea of a brochure to other lessons”. (Case 1, Group D 2, p. 3 L.38-47)

Another individual technique was drawing; this was shown more in Case 6. Perhaps the most prominent finding was that this teacher believed that drawing as a creative method could be used to directly develop the students’ mental ability to process information:

‘I saw that the most beautiful of creative ways is drawing, that it develops the students’ brains and ensures that there is information in his mind.’ (Case 6, Teach F, int1, p. 6 L. 28-32)

As a result, it was also found that one of the students indicated that drawing made him think more about the learning process and enabled him to select and design the relationship between topics in the lesson.

The technique of concept mapping was another example of an individual technique. A conceptual map is another of the techniques in the textbook. Again, whether undertaken directly from the textbook or as part of a ‘strategy for thought’ or as invented by the teacher, many students found it played a key role in developing their thinking skills. Indeed, one student found it to be of more help in developing his thinking skills.

‘Yes ‘conceptual maps’, I worked with them many ...because conceptual maps are an essential part of it. Also, recording the settings in mathematics is a sort of conceptual map, also as the foundation.’ (Case 6, St Mdevr, Int 1, p.8 L. 1 -4)

Another individual technique was that of ‘student as peer teacher’. Two teachers set up a situation where one student acted as a substitute teacher to a group of his peers. He explained a specific part of the lesson to his classmates. Afterwards he would answer their questions and they would evaluate him. Two case teachers found the substitute teacher technique helpful:

‘So, repetition and find a substitute teacher are the best opportunity to develop thinking skills.’ (Case 6, Teach F, int1, p. 4 L. 1-5)

The other teacher pointed out the possible benefits of this method for the ‘substitute teacher’:
‘We try to develop all the skills such as self-confidence, dialogue, debate and communication, problem solving, error correction.... The student prepares himself and then produces a summary; then I ask his colleagues to evaluate his skills.’ (Case 7, Teach N, Int1, p. 7 L. 8-17)

The step-by-step technique was a further example of an individual technique. The significance of a gradual strategy, 'teaching step-by-step', was revealed when large numbers of students misunderstood what the exercise was asking. This occurred because some teachers believed that the students had understood simply by reading the exercise, but the reality was that, most of the time, in all case schools, some students needed clarification of the meaning of the question. It was found that some students believed that the teacher had not explained the exercise properly or had explained it too quickly; therefore, some students had misunderstood what the exercise was asking:

‘Yes, the teacher should understand me step-by-step. Do you jump ten degrees from the bottom up? ... So, step-by-step, rather than go along’. (Case 2, St Qaraawi, int 2, p.1 L. 25-, p.2 L. 14)

5.2.4. Students’ application of the thinking skills process

With respect to students’ application of the thinking skills process and their actual application of thinking skills in the classroom, what was found from the lesson observations and interviews was that the majority of teachers tried to develop different levels of thinking skills by using a wide range of thinking skills throughout the answering of the exercises or teacher’s questions. The findings also indicate that students consistently and continuously applied a range of thinking skills throughout the lesson.

The main sorts of thinking skills they applied in the lessons, whether built into the textbook exercises or invented by the teacher, were: critical thinking, creative thinking, problem solving, brainstorming, linking, comparing, summarising, justifying, imagining, decision-making, classifying, identifying assumptions, and thinking upside-down.

Applications of students’ thinking skills differed from case to case. I will provide three examples of thinking skills that were evident throughout most cases on a continuous basis.
Critical thinking was one of the central skills that the students regularly applied in the lessons, by the teacher asking individual students or groups to be critical of others’ answers, to justify their criticisms, and to present their own, improved, answers. In one lesson observation, the teacher created his own exercise in which the aim was to develop students’ understanding, and make linkages between the teacher’s explanation and the students’ textbook content, by using various thinking skills, such as being critical, classifying and justifying (Case 6, Class Ob 2, p. 4 L. 43 - 46).

What was found was that, according to some teachers, critical thinking was a measure of a student’s progress in developing thinking skills:

‘Yes, critical thinking is an example that he’s begun to develop; to criticize and correct information. Yesterday, for example, he corrected the information that one of the students read, which I thought was true. Student (F) Said: “Sorry teacher, there is a mistake.” I was so happy - this evolution in himself. He had begun critiquing - this is a blessing!’ (Case 6; Teach R, int1, p. 9, L. 22 - 27)

The greatest improvement in students’ critical skills was obtained by applying a strategy of asking higher-order questions. Another way was reported by students who participated in interviews who showed an exercise where the teacher had asked them to comment on someone else’s written work. This had a great influence on their critical thinking. Collaborative learning had also developed their critical thinking:

‘If can’t find an answer I benefit from my colleagues; also, if the answer is wrong, I criticize it because it will the harm the group, and I may criticize my colleagues. I don’t hesitate about this.’ (Case 3, St Ayyaf, Int 1, p.5 L. 6 - 13)

Creative thinking also was another of the main skills that the students applied throughout the majority of lessons. As an example from the lesson observations, the teacher tried to develop thinking skills by encouraging students to present a unique definition of a term which was related to the lesson. He encouraged them to be creative and he explained the meaning of ‘creative’ (Case 3, Class Ob 1, p. 4 L. 44- p. 5 L. 2). It was also evident from the students’ interviews that creative thinking was applied as one of a variety of thinking skills throughout collaborative learning and the textbook exercises.

Classification was a further thinking skill that was used in the majority of cases. In one lesson observation, the teacher asked each group to nominate one representative who had to decide, through a series of thought processes, into which religious class of food each of four given foods should be classified. He should then decide whether each food must be used to pay
Zakat (alms to the poor) and then to justify his decision and give an example of its application (Case 4, Class Ob 2, p. 5 L. 27-35).

Another teacher got students to practise classification through the five rules of the principles of jurisprudence: obligatory, desirable, permitted, prohibited, and abominable. Thus, students started trying to classify what they knew about the subject of the lesson and placed it within Islamic law by the use of the five rules (Case 3, Class Ob 2, p. 1 L. 21-29).

It was also found that one of the students agreed that classification had helped him to think more about the subject of the lesson, and it was useful to extract the key point of the lesson:

‘Like if I study science, I begin to classify and draw, classify the instruments to measure temperature, wind, air pressure, so I extract the main points.’ (Case 6, St Mdevr, Int 1, p.8 L. 1 - 11)

5.2.5. The Textbook Exercises

This part offers a discussion of the application of an infusion approach in the textbook. Students’ experiences with the exercises will also be presented. Finally, discussion will give preference to the thinking skills exercises and the reason for this preference.

5.2.5.1. The infusion approach through the textbook

In 2007, the Ministry of Education initiated a programme that integrated thinking skills within the textbooks, an ‘infusion’ approach. All teachers insisted on the significance of the infusion approach in the textbook. It was more enjoyable for both teacher and student:

‘Regarding the subject of thinking skills, I prefer it to be integrated within the textbook by the Ministry of Education …Therefore being integrated with the curriculum is easier for the teacher.’ (Case 6, Teach F, int 2, p. 1 L.6 - 9)

Indications also showed that the majority of teachers believed that the infusion approach of the new curriculum encouraged the development of students’ capacities and skills by the number of exercises that included thinking skills. For example, one of the teachers said that:
'I strongly urge the inclusion of thinking skills in all curricula because all curricula have to involve thinking and this thinking will reflect on the students. In this connection, there is not any curriculum which it does not involve thinking... they all require you to think and plan things.' (Case 4, Teach R, int1, p. 4 L. 18-21)

Other teachers emphasised that they developed both skills and content during the lesson:

'I link thinking skills to the curriculum. That means, I do not give them the curriculum in a way that indoctrinates or just discusses. What I do is: I identify skills that I want to develop and which I can link with textbook information, and then enter the skill in the content.' (Case 7, Teach N, int4, p. 3 L.31-34)

It was also found that not only does the new curriculum encourage the development of students’ abilities, but also encourages the teacher to move away from traditional methods towards techniques that help develop students’ thinking skills. Findings related to the majority of teachers (Cases 1, 3, 4, 6 and 7) show that they believed that the inclusion of the infusion approach had had a huge influence on classroom performance compared to traditional teaching approaches:

'Before the current curricular development, the method of teaching was: identify some points on the board; then each point had a brief explanation beginning from the first exercise in the textbook; after that, focus on the important points in the textbook. All that meant that the process of thinking was limited. Also, the usual method was to lecture. But the current curriculum has helped me to develop students’ capacities and skills, because the current curriculum contains a wider range of thinking skills.' (Case 4, Teach R, int1, p. 5 L. 26-53)

Moreover, some teachers indicated that the benefits of the infusion approach on students’ thinking skills could be so great that the teacher could finally feel ‘satisfied’ with the result.

'There is growth and positive change in the thinking skills of students. I’ll give you an example and the mini-experience. When a student at the beginning of the school year - the beginning is difficult for me as I am a teacher and I’m also a student regarding the development of thinking skills and how to bring these skills to the curriculum. But with the passage of days during the research, and the repetition of such skills and management of the lesson on how to develop these skills, I am satisfied as a teacher.' (Case 7, Teach N, int4, p. 3 L. 10-17)

The infusion approach also helped to save time and allowed more opportunity to develop skills:
‘I do not separate thinking skills from the textbook. If they became separated, time would be an obstacle, but if thinking skills are linked with the information in the textbook, in this case, time would not be an obstacle. So, I have time to rest and for extra-curricular discussions.’ (Case7, Teach N, int 4, p. 3 L. 27 - 30)

It also had the advantage of promoting continued lifelong learning whereby the student ‘can deal with these skills spontaneously over time’ according to teachers 3, 4, 6 and 7.

However, one of teachers confessed that he doubted the importance and usefulness of developing his students’ thinking skills through the textbook exercises. That was why he had not made much use of them before my presence his classroom, when he noticed that the researcher was interested in the textbook exercises:

‘To be honest, after your presence here in classroom I noticed that you are interested in these exercises; then, after looking into it deeply, explicitly, I find that it has questions which you can say appreciates the heart of the matter, and these exercises help to consolidate the information. In fact, I started dealing with it even in the sixth year... This means that I do not know the significance of the exercise; and I haven’t got awareness of it. I mean, we have not become accustomed to it.’ (Case 2, Teach SH, int 1, p. 1 L.11 - p. 2 L.4)

On the other hand, one of the disadvantages of applying the infusion approach that emerged from the classroom observations was that the teaching/learning of thinking skills was affected by the quality of the textbook lesson; if it was difficult, the students turned away from both the academic content and the thinking skills. Here two students, when asked about the difficulties that faced them when dealing with the textbook exercises, replied that the academic content was sometimes a challenge and then they hated both the academic content and the exercises, and even the teacher himself! Moreover, this feeling was deeper if the teacher explained the academic content too quickly.

A further disadvantage seen in the classroom observations was that applying the infusion approach was harder to apply in other subjects compared with Islamic education.

In addition, two teachers felt some conflict between the textbook’s academic content and the teaching of thinking skills, mainly due to the lack of time. Nevertheless, three of the teachers did not feel any such conflict.
5.2.5.2. Students’ experiences of the exercises

The findings indicate that exercises which are built into the textbook, or invented by the teacher, play a key role in developing thinking skills, and that for some students these may actually be the only school access to developing thinking skills:

‘There is nothing - speak or discuss the issue of thinking and skills in school - only in the exercises in the book, which I enjoyed.’ (Case 7, St Hammoudi, Int 1, p.1 L. 24-25)

One of the most significant findings that emerged during the student interviews was that they all reported enjoying the thinking skills exercises, compared with the academic content part of the textbook lesson, except for one student who said that: ‘the activity is a difficult thing ... the exercises are difficult to understand and some of them I couldn’t understand,’ and then he did not feel comfortable with it.

The students’ message from interviews seems clear: the exercises were important and had a great influence on them. One of the reasons they gave was the development of their thinking skills: ‘Exercises develop the mind’; ‘Exercise helps to think’; ‘Thinking skills help to establish ways of thinking in my head and thus help towards finding the answer’; ‘When I answered the exercises I imagined two relatives and called them in my mind. Even the place of conflict I identified, which helped me to imagine it, and then I began thinking to solve the problem’; ‘There are exercises which taught me to think. These were well developed when compared to where I imagined the mercy’s cases and opposite cases, which were exactly the opposite, where I have lots of images in my imagination.’ Likewise, one student indicated that the textbook exercises contained many ways to encourage his thinking skills. ‘Here it says that we should be thinking, and here it says the word “Think”’. Therefore, he found them effective in developing his independent thinking skills, with limited input from the teacher.

‘I feel that my mind is more open. For example, I absorb more, I understand more, I tell you that my mind thinks many more thoughts ... My thinking skills were developed more and that made me understand the subject of the lesson.’
(Case 6, St Nassar, Int 1, p.3 L. 8 - 22)

A second reason was that feeling free to think in the exercises gave them a wide scope outside the formal textbook: 'because I think, and I expect, and feel the freedom to think, and my ideas and how to deal with these ideas'. Thirdly, the exercises improved their academic achievement and helped the
students to understand the topic of the lesson: 'The exercises help me to understand more and learn to be better'; 'The exercises increased my understanding of the lesson'; 'This exercise has helped very much in increasing my understanding because just from the explanation of the lesson I did not understand well but when I found a solution to this exercise, I understood'. 'They help me to retrieve information and then consolidate the information' and this was reflected in the student’s academic achievement. A fourth reason given was their translation of thinking skills from the textbook exercises to aspects of daily life. 'Sometimes I configure a hypothesis in the home and other situations. Sometimes if I want to buy something, I suppose certain things'.

A gain in self confidence when they succeeded in tackling difficult exercises was reported by some. Three students said that in some of the exercises there was a kind of difficulty but they loved it because it was challenging and they faced it. While another student said that he liked the exercises, ‘even when I was suffering from some difficulties’. Another one reported that: ‘Before solving the exercise I felt some difficulty but when I solved it I felt that that I am advanced person because I could answer’.

There were found to be matches between some teachers’ and students’ experiences, in that the exercises had a great influence on the development of students’ thinking skills as well as students’ academic achievement:

‘Yes, these three exercises had an impact by the link between the thinking skills which I learned in the extra-curricular program and the academic content; on the other hand, I apply these skills in issues of life almost daily. Also, it has contributed to our knowledge of the academic content that we have studied. I love to learn these exercises in the classroom with a dialogue to encourage and develop thinking skills.’ (Case 5, St Baradi, Int 2, p.5 L. 1- 5)

Students, as well as teachers, shared a common belief that learning using thinking skills in the curriculum was one of the best ways of allowing students to continue lifelong learning:

‘In maths, a problem is approached through an answering strategy; ..... Guess, check and search for style. ... Strategies like these help the student towards the answer and not just in the answers to the exercise questions but in the affairs of his life.’ (Case 5, St Mdevr, Int 2, p.1 L. 8- 22)

Furthermore, students believed that these exercises developed a variety of thinking skills and had an influence on different aspects of their experience. One particular student, who imagined himself reincarnated in the person of
the maid, appeared confident in dealing with thinking skills. He related how he developed his thinking skills, through the topic of the importance of compassion (for an example, see Appendix 1): 'I imagine, create and have fun'. He was able to criticise his own behaviour, comparing what he regularly did at home with what he should be doing, according to the textbook exercises:

'I criticized my behaviour with her. That means, someone may be hurting the maid, and then after that I think I won't hurt her. For example, the maid in our house, every time I issue a command: do that! do that! I did not think she could get angry or bored, but now I do not give her more commands.' (Case 3, St Khaddiri, Int 1, p.5 L. 15 - 22)

Another aspect of students’ preference for the thinking skills exercises was the translation of thinking skills techniques from textbook exercises to apply in other situations. In this regard, two clear examples of the translation of thinking skills were the following:

‘… For example, the Matrix of Standards. Last summer holiday I used it with my family, because we hadn’t decided where we wanted to travel for our first holiday. So, I worked a matrix of criteria on my blackboard at home and wrote the cities that, God willing, we will visit in order. Which cities will we visit first? I set out a matrix of criteria for the characteristics of each city in terms of the transport, markets, weather, Cities Games. ... Thus, by the matrix of standards we reached a result that satisfied everyone.’ (Case 6, St Mdevr, Int 1, p.6 L. 13 – 23)

‘One of the exercises talks about the behaviour with the maid …I mean, I imagine and suppose I am the maid, and feel what she faces; then again I think I am the other person who deals with the maid. This means I imagine and think I’m in the place of the maid - what shall I do? - then I try to imagine what she feels, and then this thinking and imagining affect me so I am more merciful with her.’ (Case 3, St Khaddiri, Int 1, p.3 L. 23 - 30)

5.2.6. Section summary

This section has presented “experience” as one of the trinity of main themes which emerged from the data analysis process. The data, obtained from the thematic findings formed on the ground by the three instruments, relate to the experience of learning thinking skills in the KSA context. This section has offered teachers’ and students’ views of thinking skills, and teachers’ preparation. In addition, descriptions of the strategies and techniques for
teaching thinking skills have been discussed. Students’ applications of the thinking skills process have also been addressed. The section included a discussion of the application of an infusion approach in the textbook exercises. In the following section, the second of the thematic findings will be presented and discussed in relation to the research questions of the present study.
5.3. Factors: ‘Factors appearing to guide teachers’ and students’ experiences of thinking skills (Related to RQ2)’

This section examines factors that frame teachers’ and students’ engagement with teaching and learning thinking skills in the classroom. Teachers and students experienced a wide range of factors which had an influence on teaching and learning thinking skills. These factors were an essential part of their actual experience and part of the process of teaching and learning. The study looked at teachers’ and students’ perceptions of internal factors and their perceptions of external factors. As mentioned earlier, this view comes from my belief that it is significant to avoid focusing on the overt factors that seem to affect the implementation of a thinking skills programme without addressing the hidden aspects of teacher beliefs and organisational issues that have a strong influence on the practical aspects of the teaching and learning of thinking.

The current study attempted to use a sociocultural perspective to look into factors influencing the development of teaching and learning thinking skills in the KSA context, which constitute significant elements in this study and form one of the central aspects of the research questions. This section also offers a discussion of the factors: a safe classroom environment, extracurricular programmes, teacher roles, relationship between teachers and students, and appropriate classrooms. These were factors which affected teachers’ and students’ experiences of teaching and learning thinking skills in the KSA context.

5.3.1. The perception of personal or ‘internal’ influences

This section offers a discussion about teachers’ experiences of the relationship between thinking skills and their religious beliefs. This encompasses teacher views on Islamic teachings about thinking; the influences of the holy text encouraging being a thinker; the influence of the biography of the Prophet Muhammad (peace be upon him) regarding the development of thinking; wages from ‘Allah’ (God); and a debate about the relationship between Islam and the intellectual domain. This discussion will focus on teachers’ experience and background, human influences and motivation. The section then goes on to discuss students’ perceptions of internal influences.
In this study, personal or ‘internal’ influences means those personal factors which came from inside the person and which emanated from individual spiritual beliefs and feelings, and also those which were derived in general from the organizational culture. These had implications for the teaching and learning of thinking skills and affected their performance in the classroom.

The most prominent finding on internal factors was that internal factors had a huge influence on teachers and these factors could have been more significant for teachers than for students. Possibly, internal factors have less influence on students because of their young age. As a consequence, this section will place more emphasis on the findings emerging from the teachers' perspectives.

5.3.1.1. Relationship between thinking skills and beliefs

Nearly all teachers were asked several questions about whether they saw any relationship between thinking skills and their beliefs. The findings indicate that teachers believed that there was no doubt that religious motivation was the major influence. As a consequence, the Islamic view of thinking had a significant influence and motivated them when teaching thinking skills:

‘As a Muslim and as a teacher, the Islamic view of thinking must have a positive influence on my way of teaching in terms of this view encourages me to encourage the development of student thinking.’(Case 7, Teach N, Int3, p. 3 L. 8-20)

Likewise, one teacher indicated that his Islamic view was 'the biggest' motivation for him to work towards developing students’ thinking. The main reason behind teachers’ belief was that their emphasis on Islam, their religious and cultural background, as supporting the learning of thinking skills:

‘We are Muslims and I am a specialist, in the Quran and the texts of the Sunnah prompt and urge us in many and important ways to the development of thinking. Therefore, Allah “God”, in many chapters in The Holy Quran, in many verses, urges thought. For example, Allah urged consideration of his creatures...This will encourage consideration and reflection, and Allah in many verses praises and commends people's minds and their understanding. Allah also draws our attention to reflect on the creation of the heavens, the creation of the earth and the creation of people... These verses and sayings of the Prophet (peace be upon him) all encourage and develop thinking skills, whether reflective thinking, that people reflect and consider, or critical thinking skills... The Quran contains a large numbers of verses which urge us
to think and to ponder and to develop thinking; also the texts of the Sunnah. We... benefit from these verses and sayings of the Prophet (peace be upon him) in the development of the thinking skills of our students. For example, to explain the law and commandment of Sharia we often put the Islamic ruling accompanied by the reason for this ruling. The third benefit, the student is able to measure how close the Sharia law is to those near to it. The student will apply regular Sharia law to new situations.' (Case 7, Teach N, int3, p. 1 L. 24-43)

As the most influential factor behind the internal influences, from the teachers’ interviews, most emphasised the importance of Islam's’ view of asking remuneration ‘Wages’ from Allah as one of the most effective sources of influence. This appeared to guide teachers’ experiences of thinking skills, and it had a positive impact on the development of their students’ thinking skills. In this regard, one teacher emphasised that if rewards from Allah did not exist 'the candle of effort would be extinguished', particularly as he faced challenges from his colleagues when he first tried to develop this class's thinking skills.

A further interesting finding to emerge from the teachers’ interviews was the strong influence of the Islamic holy texts. Some teachers believed that the biography of the Prophet Muhammad (peace be upon him) regarding the development of his own thinking had influences on them, as also did his behaviour with his friends, where the Prophet Muhammad tried to develop their thinking too:

‘Also, the biography of the Prophet Muhammad (Peace and Blessings of Allah be upon Him) regarding the development of his thinking and his association with his friends and the texts in which he urges the development of his friends’ thinking, all have an impact on the development of the thinking skills of my students. ... I’m trying to apply what the Prophet (Peace and Blessings of Allah be upon Him) did, so, I’m trying to do like him.’ (Case 4, Teach R, Int2, p. 12 L. 12-24).

The question was then posed to three teachers whether they experienced any conflict between revelation and the intellectual domain. They believed that they did not sense any kind of conflict between reason and revelation; on the contrary, they believed that Islam supported thinking, on the assumption that, if there was any little conflict, revelation should take priority, emphasising that they believed that there was no contradiction. They believed that the teacher should engage with this issue in the classroom.
5.3.1.2. Teacher experience and background

Teachers’ own life experiences were sometimes cited as exerting an internal influence on their teaching of thinking skills. One teacher explained how he tried to help his students avoid some of the problems he had faced during his studies. Two other teachers believed that their perspective of compassion had a great influence on urging them to develop the thinking skills of their students:

‘The love of my student, that I loved him more than myself, and this emerged from my previous experience, so, the humanitarian impulse is in second place. It comes from mercy.’ (Case 4, Teach R, Int2, p. 12 L. 12-15)

In summary, the findings from the teachers’ interview show that internal factors had a huge influence on the teachers when dealing with thinking skills. In particular, their beliefs had significant consequences for their effectiveness in many aspects of daily life in their particular culture and social environment. Teachers’ beliefs were drawn upon particularly when they suffered from a lack of motivation or support from their school environment, or when they experienced frustration from their colleagues; then they found motivation from their beliefs by, for example, asking for wages from ‘Allah’.

5.3.1.3. Motivation

One of the greatest factors which led to improvements in both teachers’ and students’ interactions and attitudes toward teaching and learning thinking skills in the classroom was motivation The concept of motivation could be defined as ‘the cause or stimulus of action, the driving force that initiates and directs behaviour’ (Kinetics and Daly, 2010: 86). Motivation has also been defined as "an internal state or condition (sometimes described as a need, desire, or want) that serves to activate or energize behaviour and give it direction" (Huitt, 2001).

Motivation in this study is understood as the set of dynamic forces driving teachers and students through teaching and learning thinking skills in the classroom, whether as intrinsic motivation or extrinsic motivation. Extrinsic motivation in general comes from outside the person and is attributed to the person’s external circumstances, whilst intrinsic motivation is internal to the
person and is largely a result of internal sources such as beliefs or mental and spiritual states.

The findings indicate that there were many sources of motivation for the teacher to develop the students’ thinking skills. Perhaps the most prominent finding was that some of the teachers believed that there was ‘no doubt’ about the impact of an interaction between motivation and the development of thinking skills, as it improved students’ interactions and attitudes towards learning thinking skills in the classroom. It was also found that the majority of the teachers talked extensively about motivation, its importance and impact, whether extrinsic or intrinsic motivation, for both his students and himself. They believed that motivators such as praise and rewards must be used in the introduction to education in thinking skills processes.

One of the teachers expressed his experience of the influence of motivation and its influence in improving students’ thinking skills. He particularly mentioned two students as examples from his own experience; one of them, student (F), I observed and saw as an interviewee in case study 4 as an example of a lower ability student. The teacher believed that student (F)’s development came from the motivation he gained from the extra interest and encouragement the teacher had given him.

‘I tried to encourage his thinking even if his answer was wrong. Day after day he developed as a student and sometimes I say a greeting and encourage him… There is no doubt about his development; and I say - I am saying - that I’m sure. (F)’s developing, both at the Quran and at participating in answering the higher level questions in class. He’s developed by 40-45% of the past - when I say that I’m sure about it.’ (Case 4, Teach R, Int1, p. 9 L. 1-7)

5.3.1.3.1. Teachers’ motivation

One of the interesting findings to emerge from the teachers’ interviews was that the students themselves acted as a major factor in encouraging teachers to develop thinking skills in the classroom; students inspired teachers to do the best they could:

‘To be honest, the thing that encouraged me to develop thinking skills is that the students inspired and encouraged me every minute when asked a question requiring thinking, even though the question was difficult.’(Case 6, Teach F, int1, p. 2 L. 25-27)
It was also the influence of seeing the students develop and benefit from learning thinking skills that increased the teacher’s interest in continuing to develop their thinking skills, especially if a student developed a certain skill which at which he was weak before:

‘The student later becomes the recipient of how to develop his own productive skills … So, as a teacher, I enjoy it when I find such students learn and benefit from learning thinking skills and love the lessons.’ (Case 7, Teach N, int1, p. 6 L. 12-22)

This seemed to be the importance of the teacher feeling that the student was beginning to benefit from him and starting to enjoy the teacher’s lessons. The teacher felt that he was producing and he noticed that his students were engaged and interacting. In this regard, one of the teachers emphasised how the interaction among his students encouraged him to develop their thinking skills. This influenced the teacher to adopt his best teaching style:

‘It was the students’ responses that convinced me that I should continue to have such a thing…When I explain using traditional ways I only get two or three students who interact with me in the classroom, so in this case I feel frustrated, but when I used the collaborative strategy for learning and thinking in any way, either to discuss or compare or think, I found three-quarters of the students were interacting. Here begins the vital start, so, I felt I was creating a really pure product; “I’m really teaching!” ’ (Case 1, Teach A, int1, p. 2 L. 19-25)

It seems from this that the teaching of thinking skills is a dynamic process between the teachers and students, and that it not only influenced the students but also the teacher by encouraging him to present his lesson in a lively manner which would develop his students’ thinking skills.

Likewise, the teacher’s positive views of his students had a significant role to play in encouraging him to persevere with teaching thinking skills. For example, some teachers believed that the student innately had many thinking skills but, because he was only accustomed to hearing the traditional way, these skills remained neglected:

‘The student is ready to change his memorization method; he is ready for dialogue, to develop his thinking skills; he is ready for the development of his critical thinking, abbreviation, comparison or arrangement; he is ready and has a desire to do it; so, when I practise these skills with him I find him ready to take advantage of these skills of thinking.’ (Case7, Teach N, int 3, p. 4 L. 4 - 12)

These teachers quoted the rule: as much as you give to a student, they give you back as they can. These positive views of students, that they have many
thinking skills, seemed to be of importance to the teacher when he continued to develop their thinking skills, regardless of the challenges he faced. This was shown clearly in cases 2 and 3, for example, when the case 3 teacher, as previously indicated, maintained that there was no wrong answer in the classroom, and that students’ thinking skills were unlimited. Case 2 teacher believed that he was not responsible for encourage any student’s skills who had suffered from any weaknesses in the classroom.

5.3.1.3.2. Students’ motivation

It is clear from the students’ interviews and classroom observations that the students saw an influential relation between motivation and the development of thinking skills, as revealed in one of their interviews:

‘In addition, the teacher will encourage me by saying “You’re a great champion, your question is excellent!” Then my mind will open and be increasingly open, and then I get excited and try to give my best. Therefore, my brain is large and wide with spacious room for information and into my brain comes lots of information.’ (Case 3, St Khaddiri, Int 1, p.4 L. 9 - 17)

Other students echoed this sentiment of the motivating influence of encouragement from the teacher:

‘I need encouragement because it increases my morale... By motivation I get better when I develop my thinking skills and during my studies.’ (Case 6, St Mdevr, Int 1, p.6 L. 6 – 10)

During lesson observations it was noted that: The teacher always encouraged students’ thinking by rewarding them with praise, as he often said "beautiful answering but we need more" or "grateful, excellent". This style of encouragement had great influences on the students. This style of encouragement had positive effects on the students, for example I noticed two students began to ask higher-level questions; subsequently I focused on them more closely (Case 3, Class Ob 2, p. 4 L. 28-32). It also motivated students to try to develop further thinking skills. In the following example, the teacher’s encouragement had an influence on the student’s enjoyment and encouraged him to continue trying:

‘I enjoy such exercises because it was difficult yet I was able to resolve it. As well as it took a long time and if I managed the feat, the teacher would commend me with thanks and praise.’ (Case 3, St Khaddiri, Int 1, p.6 L. 12 - 14)
However, it was not only the teachers’ encouragement that had an influence on students but there were other sources of motivation as well. One of these was that learning thinking skills and applying them would help in different aspects of their daily lives, as well as in the future, when they believed thinking skills would help them to be successful at university.

When the teacher asked questions outside the official school curriculum, as emerged from the group discussions, this was also motivating:

**Student (Oabeli):** One of the important things, in addition to what Abdullah said, is that the teacher asks questions outside the classroom curriculum.

**Student (Mazide):** It’s true, the teacher Saleh always allocates 5 or 10 minutes to subjects outside the classroom curriculum, such as... These develop my skills and give me things I did not know. (Case 3, Group D 2, p. 3 L.12-15)

### 5.3.2. The perception of external influences

In this study, ‘external influences’ refer to institutional factors and the physical environment which can affect the teaching/learning of thinking skills in the classroom. This section offers a discussion obtained from interviews, lesson observations and group discussions. It presents six sections concerning the perception of external influences, in which the following will be discussed: social and cultural factors, a safe classroom environment, extra-curricular programmes, teacher roles, the relationship between teachers and students, and the appropriate classroom.

#### 5.3.2.1. Social and cultural factors

Social and cultural factors emerged during this study. The broad opinion concerning social and cultural influence factors was that they had both a negative and a positive influence on teachers and students when dealing with thinking skills, as detailed below.

What was also found was that one of the teachers believed that the culture of the community influenced him as a teacher when teaching thinking skills in his classroom, as this teacher had taught in three different cities and had noticed there were differences among his students. This teacher emphasised that the culture of each community, as shown in its schools, had a huge influence on both teachers and students developing thinking skills:
‘I have taught in the south of the ... city, where the teacher was all; the student only wants to listen to information. ... The school community where I taught did not support the students’ thinking; so, this does not help either the teacher or student to develop thinking skills...While here in Buraydah there is more openness, the student who started here always asks Why? Why? Wants justification. When I use a discussion method with them there are kinds of interaction. So, for Buraydah, a discussion and dialogue strategy is the best... This means that communities have an impact on the teacher.’ (Case 1, Teach A, int 1, p. 9 L. 18 - p. 10 L. 4)

In general, this seemed to be the significant impact of the local community culture, to support and influence both teachers and students in the development of thinking skills processes. Perhaps the most prominent example of the negative influence of some local cultures was where children were expected to implement adults’ commands without any reason or thought. In such a situation, it is possible that the student is accustomed to hearing only, and has grown without support for his thinking skills. One result of this was a lack of confidence when the student dealt with thinking skills, as one teacher mentioned, and as I will explain later in the Challenges section.

On the other hand, positive influences of the local culture also emerged from the teacher and student interviews, lesson observations and group discussions. One of the teachers, for example, emphasised that ‘without doubt’ the society and culture had influenced him to be interested in the development of thinking skills and encouraged him to develop a thinking culture:

‘It came from reading, and the community, when people started talking about thinking skills and creativity, as well as the school began to talk about thinking skills and creativity, as the school environment made new things in myself, in terms of what I could give these students.’ (Case 3, Teach S, int1, p. 9 L. 10-14)

With regard to students, one of the teachers emphasised that the surrounding social environment, particularly the family’s educational background, affected the development of students’ thinking skills:

‘There is no doubt that the families’ education has a significant role in the development of thinking skills, no doubt about this. I give you the facts of what we have here in this school, background of society. The first is families which are of limited income and culture; they make up very few in this school. The second are families who work in business - these are not people who love to read and their parents are preoccupied with them and they make up a third. The remaining families are educated and encourage their children to develop their skills; the mother and/or father may be a teacher - these have a good condition in general.’ (Case 3, Teach S, int1, p. 10 L. 14-22)

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This seemed to be the importance of the student's family background in that it had an influential role in supporting children and encouraging them to develop their thinking skills. Supporting this finding during the students' interviews, ten students mentioned that their families played a great role in encouraging them to develop their thinking skills. For example:

‘Inevitably they have a big impact... My mother, for example, benefits from Dr. Muneef, who is a writer in Aljazeera newspaper. He has written creative stories about problems and ways of solving them, and my mother makes me benefit from reading them; also, my mother urged me to read.’(Case 6, St Mdevr, int 1, p.6 L. 6 – 10)

However, not all the families were supportive of their children or encouraged them to develop their thinking skills. One student mentioned that his family was neutral about encouraging him to develop his thinking skills, whilst one student’s family played a negative role in developing his thinking skills, as I will discuss later in the Challenges section.

One of the interesting findings to emerge from the classroom observations was that an impact of the socio-cultural context was to allow students to develop their thinking skills within the textbook exercises by applying examples similar to the reality of social life: Throughout this lesson I noticed that the teacher frequently made a link between the socio-cultural context and the textbook exercises by giving examples from the current socio-cultural context, aimed at developing his students’ understanding. I noticed this had positive influences in terms of helping students to reach the correct answer (Case 5, Class Ob 1, p. 2 L. 9 - 12).

5.3.2.2. A safe classroom environment

One of tasks of the current study attempted to look into the factors which constitute essential elements in developing teaching and learning thinking skills processes in the classroom. The results illustrate the significant influence of a safe classroom environment as one of the main factors influencing the thinking skills processes.
5.3.2.2.1. Teachers’ views of a safe classroom environment: importance and impact

This general finding, obtained from the teachers’ interviews, was shown to be important in establishing the best environment for developing students’ thinking skills through providing a safe classroom environment. Perhaps one of the most prominent elements related to views of a safe environment was as one teacher expressed it:

‘I understand a safe environment as: a place where the student feels that his relationship with the teacher is parental or fraternal so that he can express his feelings in the classroom with all freedom; he is not afraid of hearing mockery or contempt from the teacher or his peers.’ (Case 7, Teach N, int4, p. 2 L. 19 - 21)

The seven teachers interviewed agreed that a safe environment in the classroom was essential for the development of students’ thinking skills. One stated that achieving ‘safety’ in the classroom was the ‘number one’ condition in the development of thinking skills.

Likewise, one teacher indicated that the key point was giving students the freedom to talk and ask questions and to apply equality between students. This had an influential role in the existence of a safe school environment, which would influence the thinking skills process:

‘I've discovered, after 30 years of service, that the student wants you to open everything to him, … which means these students - if they went to another teacher who might inhibit their thinking freedom - that will lead to stopping their thinking.’ (Case 3, Teach S. int1, p. 1 L. 38- 40)

During lesson observations, it was noted that: The teacher, in many cases, showed awareness of the importance of giving students the freedom to talk when dealing with thinking skills by asking (as I mentioned before) or answering higher-level questions (Case 3, Class Ob 3, p. 9 L. 36-38).

Likewise, regarding the equality finding during lesson observations, it was noted that: The teacher showed his awareness of the importance of equality between students when managing the answering process and choosing who would answer. When he noticed a student who was not happy that he had not been chosen, the teacher justified why he allowed one student to answer rather than another (Case 3, Class Ob 3, p. 9 L. 43-47).
This seemed to be the impact of the safe environment, in that some teachers believed that the safe environment enhanced the development and application of thinking skills and that this allowed the student to be confident and motivated. This enabled them to be thinkers, particularly because in some local cultures it is possible that some students were accustomed to merely listening and were 'afraid to make a mistake'.

5.3.2.2. Students’ views of a safe classroom environment: importance and impact

In the students’ interviews, all students were asked several questions about the importance of a safe environment in the classroom. As with the teachers, they said that a safe environment in the classroom was essential for the development of their thinking skills. One student said:

‘The safe environment is essential to me when I develop my thinking skills. For example, sometimes when I add information about a particular issue in the classroom, I find clashes from some colleagues and then the teacher stops what I intended to say, but if the teacher supports me I will feel safe and then I develop my skills.’ (Case 6, St Trbag, int 1, p.2 L. 7 – 10)

Again, there were matches between teachers’ and students’ conceptions of the ideal safe environment for the building and development of thinking in the classroom, by giving students the freedom to ask and by treating all students equally:

‘The teacher gives me freedom to say anything, gives me freedom to ask any question...The teacher gives me comfort and freedom to say anything, and gives me time to think about it.’ (Case 3, St Khaddiri, Int 1, p.1 L. 19 - p.2 L. 7)

‘He treats all students equally and does not differentiate between us and he does not prefer one over the other.’ (Case 3, St Khaddiri, Int 1, p.3 L. 10 - 25)

By contrast, one of the main perceived challenges facing students when they are learning thinking skills was found to be a lack of freedom and they felt the teacher oppressed their thinking, or that there was a lack of equality between students, as I will discuss later in the Challenges section.

In general, it could be argued that a safe environment in the classroom is one of the most important elements when teaching and learning thinking skills. I noticed in many lessons, in some classrooms especially at ages 10 and 11, the importance of power relations among the students, and at all age levels the teacher’s power in relation to the students. Most of these teachers showed
awareness of the importance of ensuring a suitable classroom climate for the development of students’ thinking skills. One clear example I noticed was in case one when the student 'Abdullah A' suffered from some of his classmates who prevented him contributing his suggestions, but when the teacher noticed his plight he changed Abdullah’s group, resulting in a great improvement in his condition. This was an example of the importance of power relations, as will be mentioned later in the Challenges section. Such features as these contributed to reducing opportunities for the growth and development of students’ thinking skills.

5.3.2.3. Extra-curricular programmes

This section discusses the importance and influence of extra-curricular programmes as one of the factors that increased the opportunities for students to develop their thinking skills. Extra-curricular programmes are particular programmes or activities performed with students by a majority of schools (cases 3, 4, 5, 6, and 7) external to the formal lessons. The majority of these extra-curricular programmes developed thinking skills by applying the infusion approach throughout the program among or after school hours.

A convergence emerged from the three methods of the research, suggesting that participation in extra-curricular programmes or activities enhanced thinking skills development during classroom lessons as well as academic achievement and educational attainment. These extra-curricular programmes also enhanced opportunities to learn thinking skills during exercise activities. One of the key principles was that participants in most extra-curricular activities showed better understanding in tackling the textbook exercises and greater intellectual aptitude.

Through some of the extra-curricular provision, students experienced a variety of programmes such as the Cognitive Research Trust (CoRT), the method of Creative Problem Solving (CPS), and Scamber. Moreover, students learned skills such as information gathering, brainstorming, production of solutions, starting from the most important to the least important, organising their learning by work summaries of lessons and the use of tools to link information, such as linking words. In addition, through some of the extra-curricular programmes, students developed their thinking by solving real problems.
5.3.2.3.1. Teachers’ views of extra-curricular programmes: importance and impact

Through the teachers’ interviews I discovered that two of the teachers had had special experience with extra-curricular activities programmes, and they emphasized that extra-curricular activities had definitely helped the development of students’ thinking skills. Three teachers, who were asked their views of extra-curricular programmes during the interviews, said they believed that the extra-curricular programmes were significant.

‘There is no doubt that an extra-curricular program has a very high impact on students, ... I personally believe that such extra-curricular programmes for the development of skills have certainly had an impact in creating opportunities for the development of thinking skills among students, and I noticed that in the school.’ (Case 3, Teach S, int 2, p. 5 L. 11 - 14)

Two of the teachers compared formal curricular and extra-curricular programmes and, through their experience, they explained how extra-curricular programmes contributed 'indispensably' to the development of thinking skills:

‘I find that many thinking skills exist within the students but these skills are not activated within the official school day, and not exercised, but when looking for these skills and developing them or creating a new way of developing these skills through extra-curricular activities... I find that these skills exist within students... I do not only feel that but - this is for sure - but very very sure - extra-curricular activities do have an impact on the development of thinking skills in students.’ (Case 7, Teach N, Int 4, p. 5 L. 6 - 18)

One of the main reasons behind this teacher’s belief is that attendance at the extra-curricular programmes was voluntary, so the student felt a greater freedom compared with the formal curriculum, that it was not being imposed upon him as a command.

‘If the curriculum demands specific thinking skills, the student is not as receptive to such skills as if he gains them by his own interest.’ (Case 4, Teach R, Int 2, p. 1 L. 18 - 33)

This teacher was surprised that students did not regard these programmes as important, nor were they valued by some teachers in the classroom. He found those students who attended the extra-curricular program to be innovative and interactive and improving their skills. In fact, there were many reasons behind the students’ attitude, which will be discussed next.
5.3.2.3.2. Students’ views of extra-curricular programmes: importance and impact

The students emphasised the ways in which the extra-curricular programmes contributed to the development of their thinking skills. These programmes had an influence on learning and recognising thinking skills in the textbook exercises.

In the student interviews, the nine students who were asked their views on extra-curricular programmes said that they were significant and helpful. In this regard, I discovered that these nine students had special experience with extra-curricular programmes as they were members of activity programmes, either during the school day, in school but outside school time, or outside the school but officially related to the school. All these students, such Ayyaf, Trbag, Khaddiri and Mdevr, emphasized that extra-curricular activities had a strong influence on the development of their thinking skills:

‘Certainly, the extra-curricular program has contributed to the development of my thinking about 60%.... The extra-curricular program taught me how to store and organise information in my memory, and get quick access to it when I need it. Also thinking in a different way when dealing with problems. ... as well as critical thinking. In terms of knowing the negatives and positives, if more negatives were left and if there were more positives, I would try to close the negatives.’ (Case 3, St Khaddiri, Int 1, p.6 L. 25 - p.7 L. 25)

One of the interesting findings to emerge from the student interviews and classroom observations was the difference between students who had experience with extra-curricular activities and those who did not. About half of the interviewees had a knowledge background of thinking skills; when asked about the source of their knowledge, one of them mentioned that he learned it from the extra-curricular program. Students who had worked with the thinking skills extra-curricular programmes were easily able to deal with the exercises in the thinking skills textbook and were easily able to understand, as well as use, the language of thinking. However, two students, who had not worked with the thinking skills extra-curricular program, had no understanding of the term 'thinking skills'.

There were many cases of the transmission of learning from these programmes to the classroom. Some of the students interviewed gave examples of the direct influence on answering the exercise questions, requiring different thinking skills:
'In this exercise we were asked to mention cases of disobedience in dealing with parents and their opposite; such as raising the voice to them. In the extra-curricular program we learn a thing and its opposite or contradiction. Moreover, here is the same thing, and this is its opposite. So the extra-curricular program has developed the way of thinking of the opposite.' (Case 3, St Khaddiri, Int 1, p.6 L. 25 - p.7 L. 25)

Another advantage of the extra-curricular program is that it contributed to facilitating students’ learning of thinking skills by giving them more support about the meaning of the thinking skills perspective and teaching them a variety of programmes, thinking skills and possible strategies for developing thinking skills.

5.3.2.4. Teacher roles

This section examines the role of the teacher as one of the most important factors influencing the development of teaching and learning thinking skills, and as a fundamental element in the present study. This element emerged from the thinking skills procedure for both the teachers and the students, as a key facet of their experience.

In this connection, a number of authors (e.g. Cotton, 1991; Qatami, 2004; Rodrigues, 2005; Adey, 2006 a; Owu-Ewie, 2008) emphasise that teachers play an increasingly salient role in influencing the development of students’ thinking skills. Indeed, a finding of the teachers’ and students’ interviews, classroom observations, and group discussions was that the role of the teacher was extremely important for the development of thinking skills in the classroom. An appropriate role for the teacher could establish the optimum opportunity for promoting students’ thinking skills.

All teachers were asked about the importance of their role in the thinking skills process in the classroom. The teachers emphasised that they had an essential role in the development of the thinking skills of their students. One teacher believed that the teacher was responsible for 80 to 90% of the task of developing thinking skills. In the same vein, some teachers saw their role as that of facilitator and guide to students’ progress, thereby contributing to the promotion of thinking skills.
5.3.2.4.1. Teachers’ beliefs about students: that they all have some thinking skills

A finding to emerge from the teachers’ interviews and classroom observations was that teachers had positive views of their students, believing that every student had a number of thinking skills. This positive belief had a great influence on both teachers and students when dealing with thinking skills:

‘I find that many of these skills exist within the students but they are not aware that they have such skills. I find these skills exist within the student and perhaps they exist strongly; some students did not know the skill of thinking is wealth.’ (Case7, Teach N, Int 4, p. 5 L. 10 - 13)

However, the results also indicate that when this positive view of the student’s skills is absent, there are negative consequences in the process of teaching thinking skills. This will be discussed later in the Challenges’ section.

5.3.2.4.2. Students’ views of the importance of the teacher’s role

Through the students’ interviews, across all seven cases, the findings identify the teacher’s role in the thinking skills process in the classroom as being the most influential factor behind developing students’ thinking skills. This was particularly apparent when some students contrasted how their teacher, who is supposed to develop their thinking skills, can potentially be one of the challenges, as I will discuss later.

For influence, I love the teacher who is trying to accept my views and he develops them, so I love the lesson and the teacher at the same time. (Case 6, St Mdevr, int 3, p.6 L. 19)

Other students emphasised that the teacher’s style of teaching gave them ideas and skills and that this gave them the greatest support when learning thinking skills. On the other hand, some students’ view of the teacher’s role was that the teacher should use the ‘traditional style’ when he taught, and this had a negative influence on the teaching of thinking skills.
5.3.2.4.3. The teacher’s roles

Findings related to 'ground rules for teaching thinking skills' from classroom observations, teachers' and students' interviews, and group discussions indicated that the teacher’s role exerted a great influence on the enhancement of thinking skills and on the performance of students. There were several effective ways to teach thinking skills as discussed in the following:

5.3.2.4.3.1. Giving students adequate opportunity when solving exercises

What was found was that, according to some students, giving students adequate opportunity to solve exercises had a great influence on the thinking skills process. One of the most important sources of motivation for students to develop their thinking skills in the exercises was the teacher giving them the opportunity to solve the exercise themselves. In this regard, some of students distinguished between three kinds of teacher and explained the impact of the teacher’s role on the development of his thinking skills:

**Student (Said):** There are 3 types of teachers. One teacher represses my thinking skills because he does not open the door to any questions. … I never benefit, I am only just a copier and the recipient of information. The second teacher sometimes leaves my way to work out the answer and thinking, but sometimes not; so, sometimes I’m happy, while, sometimes I’m not. In this case, sometimes I feel under pressure and then I get confused and this affects my absence from school. … The third type of teacher is one who helps me in everything, does not hit, allows me to ask any questions without feeling nervous and this develops my thinking skills. … (Case 3, Group D 1, p. 2 L.3-12)

There were many roles that students assumed teachers should play and be competent at while teaching thinking skills in the classroom, such as the role of an asker of questions:

**Student (Shraideh):** There is one teacher who asks questions all the time and then my mind unfolds, in contrast to another teacher who is fighting questions, and my mind starts closing slowly. (Case 3, Group D 1, p. 2 L.3-17)

Another aspect of students’ preference for the role of the teacher was as an answerer of students’ questions:
Student (Khaddiri): When I ask a question, aiming to learn, some teachers say not to ask. When some students ask a question and could tell him the answer.(Case 3, Group D 3, p. 4 L.30-35)

While another important aspect pointed out by students referred to the relationship again:

‘For influence, I love the teacher …Also the teacher speaks with me on an equal footing, so as not to speak with me and treat me as a small child.’ (Case 6, St Mdevr, int 3, p.6 L. 19-20)

Student (Mazide): There are teachers who respect the students, and then I admire and appreciate him and I interact with him. (Case 3, Group D 1, p. 2 L.15-17)

Following from the above, students characterised their experience of the essential role of the teacher and showed that the teacher had a great influence, whether positive or negative, on their mastering thinking skills. The teacher’s positive role rested partly in giving students adequate opportunity when solving exercises; this came out clearly in the classroom observations and group discussions that were discussed in an earlier chapter:

- Answering students ‘questions;
- Giving student space to pose their questions;
- Giving enough time
- Dealing with thinking skills at the same as dealing with the textbook’s academic content;
- Explaining difficult terms arising from students’ questions.

5.3.2.4.3.2. Developing students’ thinking skills

Other aspects of the teacher’s positive role in developing students' thinking skills, as shown through the classroom observations and group discussions detailed earlier, were as follows:

- Creating his own exercises to develop students’ thinking skills;
- Creating a balance between the individual style of learning and a collaborative strategy;
- Allowing for individual differences;
- Encouraging students to think independently;
- Encouraging students to ask or answer higher-level questions;
- Encouraging students to be thinkers.
An example of a relevant lesson observation was that: In the last 12 minutes of this lesson, the teacher introduced an exercise in which animals were to be classified into 7 groups, with justifications for the choice of classification. Each group had about 10 pieces of paper with names of animals on, and they were to collect papers from other groups until they created their own animal kingdoms (Case 6, Class Ob 2, p. 4 L.25 - 29). From another observation: In this regard, the teacher supported the development of thinking skills by encouraging his students to think independently without consulting the textbook. Several times he asked his students to derive their own definitions without looking in the book. Also, he dealt with thinking skills at the same time as dealing with the textbook’s academic content (Case 3, Class Ob 2, p. 3 L. 16- 20). Many other observations were made in the same vein.

5.3.2.5. The relationship between teachers and students

A key principle emerged when six teachers were asked about the importance of the relationship between teachers and students. They believed that the relationship between teachers and students influenced the thinking skills process in lessons, particularly in terms of instituting the optimum environment for promoting students’ thinking skills. In this regard, one of the teachers emphasised that the mutually warm relationship between the student and teacher had a great influence on the development of thinking skills because it was conducive to students’ learning:

‘If the student does not love the teacher, how will he hear him? If the student does not love the teacher, how is the student to emulate the teacher’s ideas that he puts forward? If the student does not love the teacher’s ideas that he puts forward, how will the student start thinking how to apply them? If a student hates the teacher, that means there is a plug and a barrier between the teacher and student. … From my love of the students, I want everything to go properly with him.’  (Case 3, Teach S, Int1, p. 8 L. 21 - 35)

Likewise, one of the teachers emphasised that the role of the teacher was more fundamental than that of the family in the development of the student’s thinking skills, because if the student loves the teacher, the student will accept anything from the teacher.

Supporting this finding during lesson observations, it was noted that a friendly relationship between the student and teacher was significant for the growth and development of students’ thinking skills. During lesson
observations I noticed that, with a friendly relationship, the students felt soft and comfortable when asking questions, they knew that their questions would be answered and they felt that there was respect between themselves and the teacher (Case 3, Class Ob 1, p. 3 L. 13-19).

A friendly relationship not only has influences on the student, but also has influences on the teacher, which affects the quality of the teacher’s output. In this regard, during lesson observations I noticed that, in case 3 where the relations between the students and teacher were friendly, by the time the bell went, the students were still interacting and asking questions while the teacher’s description had not yet finished.

By contrast, in case 2 where the relations between students and teacher were formal, there was less interaction and question asking by the students. I noticed more than once that the teacher finished the lesson and closed the textbook five minutes before the end of the lesson, as will be discussed later in the Challenges’ section.

Some teachers also stated their views on how important such a relationship is in encouraging students to become individual learners and self-directed learners. Because the teacher of the difficult lesson developed their thinking skills and encouraged them, they developed correctly.

It was mentioned more than once that the teacher characteristic that most influences students’ learning and makes them interact and participate in developing their thinking skills was the teacher’s tolerance; he did not use violence:

‘The teacher Saleh did not hit, does not use violence, he is tolerant, he does not raise his voice in anger, while some teachers - I don’t want to mention their names - if I ask a question he tells me “You do not know!” and makes fun of me in front of my classmates. ... If I raise my hand to participate he says “Shut up! You don’t know!” and screams at me.’ (Case 3, St Khaddiri ,Int 1, p.2 L. 19 -28)

This seemed to underline the importance of a good relationship and easy communication between teacher and students, whereby the students had more respect and attention was focused more sharply on the teacher’s fundamental role in the development of students’ thinking skills.
5.3.2.6. The appropriate classroom

With the purpose of teaching thinking skills adequately, the findings showed that a good quality classroom environment not only had influences on the students but also on the teachers, which affected the quality of both student and the teacher output. Among the seven cases, five teachers had their own hall but the other two did not, meaning these two had to move from class to class when teaching. The importance of the hall regarding the teacher was that he felt more comfortable and it saved him time, as one teacher told me. I also noticed that some students came early, even if it was during lunch time, and sat in the hall. In addition, most halls were equipped with teaching and electronic equipment.

5.3.2.6.1. Physical and sensory factors of appropriate classrooms

Two teachers believed that, to have a supportive influence on teaching and learning thinking skills, some physical and sensory factors were required in the classroom. These teachers believed that, as a consequence, these factors would make the students love and enjoy their lessons. These factors make education enjoyable and encourage and prepare the student to receive the information and develop his skills within the lesson. Such factors include comfortable chairs, clean surroundings and fresh smell.

Conversely, according to some students, the lack of suitable facilities was a key factor that restricted their learning of thinking skills in the classroom. In their interviews, students were asked their views of the other challenges facing them when dealing with the textbook exercises. The initial answer given by a student was:

‘A lack of creating conditions and appropriate environment to develop thinking skills. For example, here in classroom, we have not any access to the Internet.’ (Case 3, St Ayyaf, Int 1, p.8 L. 24 - 26)

Findings also related to the classroom building. In one case the classroom was very narrow and uncomfortable with bad lighting and hardly any air; also, the students’ tables were packed closely together. Therefore, classes in rented buildings could have an adverse influence on the development of thinking skills.
Suggestions also indicated that four factors of an appropriate classroom atmosphere were essential elements in developing the level of students’ thinking. One of the teachers believed that the main reason behind their development was:

‘The first point is the comfort of the student when asking the question; and he knows he will not be reprimanded or admonished or mocked, and I really assume the importance of it to be about 60%. The second point: that when the student is asked he will find proper answers between 70 to 90% of their questions. The third point is that the student finds that in the classroom issues are raised which are different to the formal curriculum, to make students think before they ask. The fourth point: the student has good colleagues who ask wonderful questions and the teacher encourages them.’ (Case 3, Teach S, Int2, p. 5 L. 27 - p. 6 L.5)

A further observation, as regards the student having great colleagues who ask excellent questions, was that: In this lesson I counted more than six questions which emerged from the students themselves. I can classify them as very high level questions regarding the age of the students and the contents of the textbook. Also, the students gave excellent justifications and supported their answers with evidence, applying assumptions and making links (Case 3, Class Ob 3, p. 8 L.7-11).

With respect to there being some issues discussed in the classroom which were outside the formal curriculum, throughout the lesson observations it was apparent that this often occurred. In the group discussions, students expressed their view of the importance of doing some exercises that came from outside the formal curriculum:

‘Questions based more on understanding, based on something outside the classroom, outside the curriculum, such as the making of a hypothesis. Yesterday, in the science lesson, we composed a hypothesis that involved concluding, explaining, and so on. I liked it even though I could not solve it. The important thing is that the exercises come from outside the classroom and at the same time encourage me to think bigger and more comprehensively.’ (Case 5, St Mdevr, Int 2, p.1 L. 8-14)

5.3.3. Section summary

This section presented ‘factors’ as one of the three main themes, which were deeply embedded during the data analysis process. The data were obtained
from the thematic findings formed on the ground by the three research instruments related to the experience of learning thinking skills in the KSA context. Two axes were identified. First, the perception of internal influences that were contained in the relationship between thinking skills and beliefs, teacher experience and background, and motivation. Second, the perception of external influences that involved social and cultural factors, a safe classroom environment, extra-curricular programmes, teacher roles, the relationship between teachers and students, and the appropriate classroom. In the following section, the third of the thematic findings will be presented and discussed in relation to the research questions of the present study.
5.4. Challenges: 'Challenges facing the teaching and learning thinking skills process (Related to RQ3)'

This section focuses on the main perceived challenges facing teachers and students in the classrooms as one of the three main thematic findings of the holistic way in order to better understand the dynamics of executing a thinking skills process in classroom in the KSA primary context. This is significant for the understanding of challenges to the development of thinking skills via teachers’ and students’ practices and the implementation of comprehensive thinking skills programmes in the classroom. Furthermore, these challenges were documented through the interview data, the classroom observations and group discussions throughout all seven cases. It was found that eight main challenges faced teachers and students in the classroom when they were teaching or learning thinking skills. In order to organise these challenges, so that they fall into line with what emerged from the data on teachers’ and students’ experience, the challenges will be divided into: teachers’ challenges, students’ challenges, and textbook challenges. However, several common points emerged as challenges for both teachers and students, as I will explain later.

5.4.1. Teachers’ Challenges

5.4.1.1. A lack of time

As previously indicated in the ‘Experience’ section, giving enough time is a key element in the development of thinking skills strategies. Teachers required more time to participate in efforts to improve students’ thinking skills. Also, students needed time to develop sequential thinking skills within integrated curricula. Four out of the seven teachers interviewed mentioned that time was a challenge; one of them even emphasised that time was his only challenge.

A relevant lesson observation was that: When the teacher started answering the textbook exercises – the time given to this exercise was less than five minutes - it was also at the end of the lesson. Three minutes had already gone and the students did not have a clear understanding of a key word in the main question and, just as they started answering, the sound of the bell announced the end of the lesson. So most of the students had not completed
the exercises; some had not written a word in their notebooks (Case 1, Class Ob 1, p. 3 L. 38-46).

From another observation: Firstly, the teacher did not give students an adequate opportunity to solve the exercises, just a minute or two! Secondly, in one question where the teacher extended the time to about four minutes, I noticed that the opportunity for students to answer the exercises was more reasonable, giving each group the chance to present their answer (Case 1, Class Ob 2, p. 4 L. 1-7). Many other observations were made in the same vein.

Therefore, the main negative result of lack of time, according to classroom observations, was that the majority of students were unable to complete their answers to the exercises.

Another negative result was that exercises had to be omitted. One of the teachers, for instance, had to resort to 'jumping exercises':

‘The textbook and its ideas are beautiful … So many ideas need time from the teacher; that means that the plan imposed by the curriculum for each exercise needs two sessions, while, for the teacher, the pressure of the curriculum means leaving things out and jumping exercises.’(Case 6, Teach F, int 1, p. 4 L. 16 - 24)

This latter point could be explained by the fact that nearly all teachers had a positive attitude to thinking skills processes and that the majority of teachers believed that the inclusion of thinking skills in the school curriculum was important and 'an essential part' (as previously explained in the experience section). However, the lack of time had a negative influence on some of the teachers when trying to tackle thinking skills through inclusion within the school curriculum. Two teachers emphasised that they wanted to develop the students' thinking skills but they could not because of the pressure of time. Therefore, time pressure produced some of the features that affected the process of teaching thinking skills, such as giving students too little time and 'jumping exercises'.

One of the main causes of this lack of time to emerge through teachers' interviews and classroom observations was the continuous assessment system (CAS). Four teachers believed that the CAS reflected negatively on the development of thinking skills, in that the CAS consumed time and effort rather than directing this time and effort to developing thinking skills.
‘The CAS is a short exam. … Here it is required that I question all the students. How much time will it take? I mean, if I ask each boy, and discuss with each one, it will take time. So, this will take me a lot of time. This problem is now that the CAS took me half the time’. (Case 3, Teach S, int 1, p. 3 L. 18 - 35)

The CAS consumed two whole lessons in case 5; the teacher’s time and effort were directed as this assessment rather than at developing thinking skills. Consequently, he felt some pressure in getting through the curriculum. Supporting this finding during lesson observations, it was noted that: A large part of the lesson was spent on the continuous assessment process which focused on the students’ mastery of a list of information, knowledge and skills contained in the textbook. This focused on basic knowledge and skills, such as listing, recalling, saving and knowing (Case 5, Class Ob 1, p. 1 L. 9-12).

Another cause of lack of time was found to be the number of students in the class. However, different views emerged on whether the number of students in the class presented a challenge to teaching thinking skills. Four out of the six teachers who were asked about this point said that the number of students did present a challenge; some believed it was an important challenge:

‘Time is an obstacle, especially with the large numbers of students. …I say that because how will the students who I ask and talk with, if, for example, they were 15 students 15 multiplied by 2 minutes makes 30 minutes, but 25 students multiplied by 2 minutes makes 50 minutes - time finished ten minutes ago! And it is still only two minutes for each student.’ (Case 3, Teach S, Int 1, p. 13 L. 26 - p. 14 L. 4)

However, one of the teachers believed that the number of students was not a challenge, while another thought that it was not the number of students, but rather the quality of students that was the challenge.

An additional source of lack of time was found to be the intensity of the academic content in the textbook and its pressure on the teacher:

‘Thinking skills are very beautiful, as they are given to us in the teacher’s book they were quite convincing, but the problem is the intensity of the curriculum. I mean, the teacher loves the benefit his students get from the curriculum; but I cannot benefit my students through two sessions only, possibly even three sessions would be needed.’ (Case 1, Teach A, Int 1, p.6 L. 4 - 8)

In this regard, two teachers felt there was a discrepancy between the textbook’s academic content and its thinking skills. Taken together, time pressure and intensity of academic content had a significant impact on the
operation of learning thinking skills. Some teachers believed that there should be a separation between the academic content and the thinking skills in the textbook, particularly as the curriculum must be covered within the academic year; therefore they linked the infusion approach to the time shortage. This could be why some teachers did not deal with the thinking skills as an essential part of the school curriculum. It may also be a result of teachers’ lack of experience of dealing with thinking skills because the concept of inclusion was not clear to them, due to their lack of training, as will be explained later.

In contrast to the above, two teachers did not see time as a problem. They did not believe that the development of thinking skills needed extra time to teach. They argued that the same lesson could be done differently. For example, case 7’s teacher believed that if an infusion approach was used, time would not be a challenge:

‘I do not separate thinking skills from the textbook. If they became separated, time would be a challenge, but if thinking skills are linked with the information in the textbook, in this case, time would not be a challenge. Therefore, I have time to rest and for extra-curricular discussions.’ (Case7, Teach N, Int 4, p. 3 L. 27 - 30)

Supporting this finding during classroom observations, it was noted that, in case 7, no pressure of time was noticed when teacher and students were dealing with thinking skills. This might be because case 7’s teacher had good experience of dealing with thinking skills, as I noted during all classroom observations. Another teacher, who had previously found that time was a challenge, found that with the introduction of the infusion approach time was no longer a hindrance.

This may well be related to the fact that those teachers had received training regarding thinking skills and so were able to integrate the academic content smoothly with the thinking skills, taking less time. On the other hand, the two teachers who felt a discrepancy between the textbook’s academic content and the thinking skills were among those reporting that lack of time was a challenge.

In summary, time pressures were mentioned to be a major challenge by a majority of teachers. Across all the research methods, factors that exacerbated this challenge for these teachers were found to be: the continuous assessment system, the number of students in the class, intensity of the academic content in the textbook, lack of teachers’ experience of dealing with thinking skills and/or lack of advanced planning for the textbook’s exercises.
5.4.1.2. A lack of professional training

As previously indicated in the exercises section, all teachers believed that their university preparation had been inadequate for the learning and teaching of thinking skills. However, professional in-service training courses were the single most important factor in a teacher’s development in terms of assisting them to gain a better understanding of thinking skills and their importance.

‘Teachers need training courses in order to learn how to deal with the development of thinking skills in students, because few teachers know the skills of thinking.’ (Case 6, Teach F, Int 2, p.1 L. 21-23)

However, findings emerged from the teachers’ interviews and classroom observations, which showed features of the teachers’ lack of experience when dealing with thinking skills, such as a lack of awareness of the importance of thinking skills in the exercises in the textbook, and a lack of clarity when dealing with thinking skills. In this respect, teachers’ interview findings indicate that there were a number of training constraints that contributed to reducing opportunities for the growth of teachers’ skills and their ability to deal with thinking skills in the classroom.

Perhaps the most prominent finding was that, although one of the teachers believed that in-service training courses were the most significant factor in a teacher’s development, other teachers focused on development of skills during and pre-service:

‘The problem is you find that a number of teachers have been teaching for twenty years … and that they depend only on their university preparation, but that university preparation is gone! As well as courses during service, there are many courses taken about these topics, but attendance is not compulsory; therefore, you find no-one involved in these courses.’ (Case 7, Teach N, Int 4, p.6 L. 8-19)

This latter point could be explained by teachers’ unwillingness to participate in the in-service training courses, which were provided by the local Department of the Ministry of Education, which is the official and free organization focussing on the development of teaching performance of teachers. The main reason behind teachers’ unwillingness was that, as one teacher believed, the training courses were ‘very weak’ and he emphasised, in his school, months pass without any teacher going on a course. The major cause behind this problem was the lack of professionalism of the training courses, in that ‘the trainer of the session is not qualified’. In addition, the
conditions of the curriculum, students and school sometimes did not fit and this made it difficult to find a good time for training:

‘I do not share because I do not like to go outside of formal working hours.’
(Case 5, Teach M, Int 1, p.1 L. 19- 22)

Furthermore, some teachers’ sensed that there was no benefit from the training courses and then felt bored:

‘Many of my colleagues said that they went on such a course but we did not feel we benefited from anything new. What the trainer said could be found in books, I mean, people knew some things and started to address them, by means of which there was a lack of professional training or even background references that I could rely on from him. Just a lecture such as what I take in the classroom.’ (Case 7, Teach N, Int 1, p.6 L. 33 - 35)

Therefore, a lack of opportunity for the professional development of teachers’ thinking skills was the main training challenge facing the teacher wanting to develop his thinking skills:

‘However, with all this, in my view there are a number of creative teachers and they have the skills, but are only waiting for someone to extend his hand. The Department of Education officials, Ministry or University should be extending their hands to them. I give you another example: I as a teacher I now have 19 years’ service. Did the Ministry offer me to complete my study by a diploma in the development of thinking skills? No! ... When did one of the Department of Education officials or the University come to the school and set up a workshop or session for us and our students? Never!’ (Case 7, Teach N, Int 1, p.2 L. 20- 25)

This seemed to emphasise that there were teachers ‘waiting for someone to extend his hand’ by establishing professional training courses to contribute to improving their skills in teaching thinking, whether from the Ministry of Education or the local university. The University, some teachers believed, bore part of the responsibility to raise the level of the teacher to be able to teach thinking skills.

5.4.1.3. 'Swimming against the stream'

As previously indicated in the section on experience, nearly all teachers had a positive attitude to the thinking skills process. However, several factors were reported that related to teachers’ feelings of frustration, obtained from teachers’ interviews, which reflected negatively on the thinking skills process.
One such factor was that some teachers felt that they were working alone in their school environment:

‘The most important challenge I face is that I find I am working alone. I ask for mutual visits between teachers within the school to share their experiences, but nothing has happened. .... So, I find myself alone; maybe there are just one or two teachers in among more than forty teachers in this school; How will I cope with such grief and sorrow in myself? I say quite clearly there is frustration!’ (Case 4, Teach R, Int 2, p. 3 L. 15 - 28)

Therefore, the major challenge identified by some teachers was the uncongenial work environment; it had a very negative impact on them in contributing to a feeling of frustration. From the tone of voice of some of the teachers interviewed, a kind of frustration was evident because of the lack of interest of their colleagues in promoting thinking skills.

‘Yes, I am sometimes frustrated. The feeling among teachers is a challenge, and a major challenge for me and I am confident that if another teacher is faced with this mix of teachers he will stop at a certain point. He will say that he doesn’t find anyone to encourage and support him to the development of the students’ thinking skills.’(Case 3, Teach N, Int 2, p. 3 L. 27 - 31)

One teacher felt that, in trying to promote thinking skills, he was like a person 'swimming against the stream':

‘The overall school environment does not help; I am, like, swimming against the stream, and, unfortunately, this is the reality ... Such cases as me are like planting or rooting a small branch in front of a strong gushing stream - this branch may remain or may drift with the tide.’ (Case 7, Teach N, Int 4, p. 4 L. 27 - 32)

I hope that the idea of developing students’ thinking skills does not 'drift with the tide' due to lack of encouragement from the Ministry of Education. Since the teacher who works hard to develop his students’ thinking skills does not receive greater rewards than a teacher who adheres to traditional methods, some teachers might be wondering why they are working hard even though it is not necessary. This could be because some of the teachers resist change if it will benefit their students. Some teachers may be trying to accept the positive change in their teaching style but may also be spreading a tone of frustration among teachers:

‘I say quite clearly there is frustration especially when I sit with some of the teachers and ask them if they will be with the students as well, and I find that the teacher says: “Oh, teacher (R), the Ministry is not interested in your work…”’ (Case 4, Teach R, Int 2, p. 3 L. 15 - 31)
5.4.2. Students' Challenges

5.4.2.1. Weak student literacy

Among lower ability students, one of the key challenges which led to constraints in their interactions and negative attitudes toward learning thinking skills in the classroom was their weakness in literacy. Their weaknesses in writing, spelling and reading had a negative impact on the development of their thinking skills, as seen in cases 1, 2, 4 and 5.

In the students’ interviews, four students were asked about the challenges they faced when dealing with the textbook exercises. They said that weak literacy was sometimes a challenge to the learning of thinking skills:

‘Reading is difficult and it worries me, whereas understanding is easy to me; but reading retards my understanding and finding out what the exercise wants.’ (Case 1, St Aidi, Int 1, p.1 L. 7 – 13)

During lesson observations too, I found that weakness in literacy was a stumbling block for one student in trying to share with his group. When he started to read the main question he found it difficult, and even when he was the writer of the group, he remained nervous. Sometimes when he read he started messing about and annoying some of his colleagues, but when he could read the question, or when he was not the writer, his behaviour changed to that of a helpful student. Sometimes his skills even improved, as I noticed with ‘Solomon’, who suffered from some weaknesses of literacy but when he could read the question he had a good understanding and contributed to the development of the answer, criticizing some of the solutions proposed by his colleagues (Case 1, Class Ob 2, p. 7 L. 2-12).

One of the aspects of weak literacy that had a negative impact was the way that one student focused on the linguistic correctness of his work rather than on the interaction to develop his thinking skills that were the aim of the exercise. This student concentrated on looking at what his colleague had written and copying it. One clear example of this occurred during lesson observations when it was noticed that one of the students had difficulty when he tried answering the second exercise, concerning the righteousness of parents and not cursing others. This involved the development of more than one skill and the transfer of learning to a new context and the creation of a new but related situation. I noticed that this student had stopped answering...
the question. I also noticed that he suffered from really bad spelling. When I questioned him about his difficulty, he said that he knew the answer to the question but he was unable to write the answer: ‘I kiss the head of my mum’. Although I helped him to spell the words he still made many errors. My main note is: this pupil was concentrating on the linguistic correctness of his writing, rather than on the interactive skills that were the aim of the exercise, such as creating a new situation, making a plan and decision-making (Case 2, Class Ob 3, p. 5 L. 13-26).

Another aspect of the negative impact of weak literacy on learning thinking skills processes could be explained by the student suffering from a lack of confidence. This seemed to be an underlying key factor that restrained the development of his thinking skills. In the group upon which I was focusing, I found that a weakness in literacy was an essential challenge for the student ‘Mutairi’; due to his weak literacy he suffered from lack of confidence. This reflected negatively on the development of his thinking skills. I noticed that he always looked at what his classmate had written and copied it. As I mentioned in case 2, the student’s thought was concentrated on writing correct words more than on interacting with the exercises’ thinking skills (Case 4, Class Ob 1, p. 3 L. 4-10).

The group discussions confirmed these findings:

**Student (Aidi):** I do not understand the exercise well; I do not understand the answers. … I do not know how to read it. Reading exercise is difficult for me.

**Student (Muhanad):** I also, like (Aidi), reading exercise is difficult for me. Then it is a hindrance to me when I’m dealing with textbook exercises.

**Student (Aidi):** It’s correct; sometimes when I began reading I could not say the word. Then I start to be afraid and ashamed in front of my colleagues.

**Student (Aqual):** The group says to me “Can you sit down? When your turn comes you will respond”. They do not give me the opportunity to answer; then I feel frustrated. (Case 1, Group D 2, p. 3 L.15-25)

The negative impact of literacy weakness on learning thinking skills processes was manifested in the majority of lower ability students, who focused more on the accuracy of their spelling or reading than on the dialogue with colleagues, being critical of their answers, or answering the textbook exercises. This could be because the student suffered from a lack of confidence that made him ashamed in front of his friends.
5.4.2.2. Power relations

As previously explained, students need to feel safe when they are thinking and learning. Authority is one of the essential elements to learning thinking skills. Concerning the importance of power relations, it was found that the main challenge facing some of students was the power relation.

The power relation, whether coming from the teacher's authority or, in collaborative learning, from power relations between elements of the group, resulted in the lack of a safe classroom environment. Hurt feelings, fear of ridicule and lack of group confidence in the answers of some members, resulted from unequal power relations in the classroom. Each one of these had a negative influence on the thinking skills process.

A clear example of power relations occurred when the teacher asked a question and gave all groups the opportunity to answer. Suddenly student 'Mohammad' shouted: 'Oh teacher my group won’t give me the opportunity to answer!' Then he returned to his chair angry and frustrated. When I asked him what happened, he said his group did not give him an opportunity to share in answering the question (Case 1, Class Ob 2, p. 6 L. 1-6).

Some teachers showed awareness of the importance of having a safe environment for the development of students' thinking skills, and of giving students freedom of expression in the classroom without any aspects of the power relation:

‘The student may know the correct answer but he cannot say it because he is afraid of crushing or ridicule or mockery; because he has previous experience, he might have suffered from ridicule or mockery from his colleagues or the teacher.’ (Case 7, Teach N, Int4, p. 2 L. 11 – 36)

Findings from the students' interviews included one of the students who emphasised that, as a consequence of tensions caused by the teacher's power, he felt that he 'wanted to lie under the table'. This was a serious situation, giving part of the picture of the reality some students were experiencing in the classroom and the unsafe learning environment for the development of thinking skills created by some teachers. A vivid account of the student’s fear of the teacher’s power was given by one student:

‘When the teacher rebukes the student, I feel that the teacher is nervous and angry, and we as students are afraid to deal with the teacher in this case. We’re
afraid that, if we said anything, and then the teacher would be running fire for
us. The teacher gets very angry and we are afraid; there is no dialogue between
us; there is a wall of separation. ... And then, all the students go silent, some go
to sleep, and some of them are painting, writing, absent-mindedness, and some
are here and there, and no-one is with the teacher.’ (Case 6, St Mdevr, int 3, p.5 L.
1-5)

Further, during lesson observations in cases 1, 2, and 4 there were aspects of
‘power relations where an unsafe classroom environment arose from fear
of the teacher or of certain other students. Each one of these had negative
influences on the thinking skills process.

One of the aspects of the teacher’s authority was that some students were
afraid of the teacher, in that the teacher could have a negative perception of
their academic level. One of group’s guides, the student ‘Majid’, told me that
he sometimes did not answer the exercise questions because he was afraid
that the teacher would have a bad perception of his answer as his academic
level was weak (Case 4, Class Ob 1, p. 3 L. 25-27).

On the other hand, one of the findings to emerge from both the group
discussions and classroom observations was that one of the power relation
features that led to tensions between group members and had a negative
influence on the thinking skills process was students’ feelings of rejection
from other students. For example, student (Abdullah A) one of case 1’s
students, was a good student, not suffering from any academic weakness, but
his problem was the power relations:

**Student (Abdullah A):** This group does not give me the opportunity to tell the
answer. Student (…) shouts at me and refuses my answer. I tell him I know the
answer but he refuses to let me answer, but when the teacher moved me to
here, ‘a second group’, they give me the opportunity and it is nicer with them.’
(Case 1, Group D 1, p. 1 L.23-37)

Abdullah A’s account was corroborated by the lesson observation, where I
noticed that he was in an unsympathetic group in the first part of the lesson,
so was suffering from marginalization, but when the teacher changed his
group, moving him from the one on which I was focusing more, I noticed a
significant change in his interaction. He was asking and answering more, as a
creative student, especially answering the difficult question that no other
student could answer (Case 1, Class Ob 2, p. 5 L. 38-45).

This underlined the importance of a safe classroom environment as one of the
most significant resources for learning thinking skills, as was mentioned
before. Conversely, it emphasises the negative influence of features of an
unsafe environment classroom. This may well be related to the finding that power relations were seen to be a key factor which restricted the development of thinking skills in the classroom, whether the student was in fear of rejection from other students or feeling a lack of trust, or unequal power relations between students. These features of power relations seemed to act as hindrances to the creation of opportunities for promoting students’ thinking skills in the classroom.

5.4.2.3. Student perceptions of the teacher as potentially one of the challenges

As mentioned previously in the ‘Influences’ section, the teacher’s role was very significant for the development of thinking skills in the classroom. However, one of the main challenges that emerged from the student interviews, lesson observations and group discussions was that the teacher himself could be the main challenge when students were learning thinking skills. Various aspects emerged where students spoke of the teacher as a challenge due to his manner and teaching methods, in terms of the use of traditional methods, the teacher’s irritability, and the unequal relationships he established in the classroom.

One of interesting findings emerging from the teachers’ interviews relating to the teacher as potentially one of the challenges occurred in one of the teachers’ descriptions of his experience in which he indicated that he believed the teacher was responsible for 80 to 90% of the task of developing thinking skills, and that between 80 and 90% of the challenges come from the teacher:

‘Yes, I think that between 80 or 90% of challenges come from the teacher. ...Imagine a teacher whose only goal is the delivery of information from the textbook to students’ minds. It means that you are like one who has water and pours it in the cups and then wants to go. That means he wants the students to save without thinking, without conviction, and without understanding, just keeping it in order to pass exams and without thinking.’ (Case 3, Teach S, Int 1, p.1 L. 33 - p.2 L. 15)

When eleven students were asked their views of the challenges facing them when dealing with the textbook exercises, the initial answer given by four students was the teacher:

‘Some teachers do not give me the right atmosphere to offer my thoughts and my views, and they often only use the style of explanation. If the teacher only
explains, explains, I feel bored of the lesson, and when the teacher's lesson starts I feel apathy and frustration. This teacher has greatly contributed to my level which seems unusual and less than what is required of me as a student.’(Case 6, St Trbag, Int 1, p.5 L. 1 - 9)

The reason why the teacher emerged as potentially one of the challenges started to emerge during the interview with one student who emphasised that one of the teachers did not leave room for questions; this teacher did not leave room for dialogue with the students. In addition, some students emphasised that some teachers did not give them the right atmosphere to offer their thoughts. Some students emphasised the confused feeling they got from the nervous teacher. One student even compared this teacher to a ‘registrar’:

‘The main challenge is the teacher who may not be able to deliver commentary ... Or he does not answer questions. He is like a registrar who reads from the book only.’(Case 7, St Hammoudi, Int 1, p.2 L. 6 - 8)

Furthermore, the classroom observations and students’ descriptions of their experiences indicated that the reason why some teachers seemed to see challenges were as follows:

- A lack of experience in dealing with thinking skills;
- A lack of awareness of the importance of thinking skills in the exercises in the textbook;
- Not addressing thinking skills at the same as dealing with the textbook’s academic content;
- A lack of advanced planning for the textbook’s exercises;
- Not explaining the exercises;
- Use of traditional methods;
- Moving between exercises too quickly.

A clear example of a teachers’ lack of experience in dealing with thinking skills occurred when, over the course of seven minutes, the teacher went through four exercises. He started reading the first exercise, and at the same time answered the questions without giving students an opportunity to solve them or even to understand what they were all about. This had a negative influence, as I noticed that a large number of students did not write anything in the answer space. When I asked one of those students why he had not written the answer, he told me: ‘I did not understand how I should do it. It is difficult - and then I wasn’t paying attention’(Case 2, Class Ob 3, p. 3 L. 41- p. 4 L. 3).
In general, it could be argued that the teacher as role model is one of the most important elements throughout the thinking skills process; at the same time, it could also be argued that the teacher can be one of the main challenges. The negatives roles played by some teachers seemed to be key factors that restricted the development of students’ thinking skills. Most of the key ideas about teachers’ negative roles could be related to teacher skills and dispositions about how best to deal with teaching thinking skills in the classroom, particularly when using the infusion approach.

5.4.2.4 A lack of time

Findings emerged from both the student interviews and group discussion, where ten students were asked their views of the importance of time when dealing with thinking skills. One response was:

‘Understanding the question takes a long time; this is the problem …. But if I understand the question it's all OK.’ (Case 6, St Mdevr, Int 1, p.13 L. 10 - 14)

They presented shortage of time as a challenge that faced them when learning thinking skills, particularly when answering the exercise questions. They reported that time was sometimes short so they got confused and they ‘can’t think’.

Student (Abdullah H): I cannot focus because of time pressure.

Student (Resheed): Yes, I agree with Abdullah. (Case 1, Group D 1, p. 1 L.8-11)

Student (Abdel-Kurim): The book is full of information and then the book needs time.
Student (Ali): Exercises need more time and this is not done. ... (Case 6, Group D 1, p. 1 L.9-11)

The findings also indicate constraints on the quality of the thinking skills process that occurred when the teacher only allowed a short time. In such cases, the students' benefit from the exercises could be limited.

In addition, some students did not feel the importance of developing their thinking skills because they felt there was pressure and a feeling of conflict when dealing with thinking skills, particularly when they were integrated with the heavy academic content of the textbook:
‘The pressure of information creates a pressure on my mind, then my mind does not understand the information. Much of the information in my mind has not been understood. I mean, if new information comes, it expels the previous information and then there is no time for reflection and thinking.’ (Case 6, St Nassar, Int 2, p.1 L. 5 - 8)

The findings also indicate that another challenge linked with lack of time that occurred with group work was 'pressuring from the group' or 'excessive competition'. For example, in 'competition time' students searched for information by reading through the book and presenting any information, instead of thinking carefully about the information. This disadvantage was also noted during lesson observations: the students are usually under heavy pressure so that they look in the textbook and scan it quickly without in-depth thinking. Also, there was a lack of opportunity for dialogue and developing thinking skills (Case 1, Class Ob 2, p. 6 L. 15-17).

On one occasion the group on which I was focussing told me they did not understand the question. I asked them to put aside the textbook and think without any pressure. By thinking for themselves and trying to understand the question, after less than two minutes they answered it and were the only group to answer this question. Then I asked them how they had answered the question. They said that they had stopped looking in the textbook, and thought for themselves and then they were able to answer the question (Case 1, Class Ob 2, p. 6 L. 22-34). This illustrates the negative influence of scanning the book due to time pressure.

All in all, these findings emphasise the importance of giving enough time when learning thinking skills during the lesson; time pressures were mentioned to be a major challenge by a majority of students, having a negative influence on the development of their thinking skills.

5.4.3. Textbook Challenges

As previously indicated in the ‘Exercises’ section, the majority of teachers and students insisted on the importance of the infusion approach in the textbook and its influence on the development of students’ thinking skills. Nevertheless, one of the main set of challenges to emerge from the interviews, lesson observations and group discussions concerned the textbook.
One of the challenges presented by the textbook was the difficulty in understanding the exercise questions due to the difficult terminology used in some questions. In one observation, I noted that there was a lack of understanding of some of the vocabulary in the exercise questions, namely ‘alternating’ and ‘hypothesis’. When the teacher asked ‘Why is there alternating day and night?’ I noticed confusion on the faces of many students. The teacher asked some groups: ‘Why don’t you answer the question?’ After two minutes, one student asked: ‘Oh teacher, please, what does alternating mean?’ Then the teacher explained what alternating meant and after that I noticed that many of the students who had been confused started to answer the question. The same happened with the term ‘hypothesis’ (Case 1, Class Ob 1, p. 2 L. 14-22).

A similar problem occurred with a question about comparison skills: ‘What is the relationship between a solution and a mixture?’ but he did not explain the meaning of either ‘solution’ or ‘mixture’ so that students did not have a good understanding of the question, resulting in their guessing rather than developing their thinking skills (Case 1, Class Ob 3, p. 7 L. 39- p. 8 L. 4).

Another problem relating to the textbook, found in case 2, was that students lacked familiarity with the type of exercises. One exercise was for developing skills of comparison, but the students were not familiar with such exercises. More than two minutes passed with the students not understanding exactly what the exercise was asking. As the exercise asked, ‘What aspects of the agreement and disagreement’, I noticed many students asking about the meaning of ‘the agreement and disagreement’. This point highlights the importance of the students getting used to the language and terminology of thinking skills (Case 2, Class Ob 3, p. 3 L. 15-21).

The group discussions gave supporting evidence on this, where some students asserted that unfamiliarity with the exercises was one of the difficulties that faced them when dealing with the thinking skills exercises:

**Student (Saleh):** The exercise questions are difficult to understand. ... I ‘m not accustomed to the applications that exist in the exercise, such aspects as assuming within the proposed exercises.

**Student (Ali):** I don’t understand the exercise questions. (Case 2, Group D 1, p. 1 L. 9-16)

This seemed to be one reason for the lack of regular use of the textbook exercises in the classroom, as will be expanded on later when discussing case
2, in Chapter Six, Section 6.3.2.1. Also, the teacher had an incorrect view of the infusion approach, in that some teachers did not have the correct concept about integrating thinking skills within the curriculum, nor did they believe in its importance to the students.

Another challenge of the textbook was that some exercises contained in-depth questions that were difficult for the teacher and that required advanced planning. In one instance, the teacher had to ask me if I knew the answer. He said that 'it is strange and it isn’t clear’(Case 4, Class Ob 1, p. 2 L. 43-45).

Overall, throughout the classroom observations and students’ descriptions of their experiences, it was apparent that there were several challenges to using the textbook, such as students not being given the opportunity to solve the exercises, and the absence of examples and models for solutions within the exercises.

5.4.4. Section summary

This section presented ‘challenges’ as one of three main themes, which were deeply embedded during the data analysis process. The data were obtained from the thematic findings formed on the ground by the three instruments related to the experience of learning thinking skills in the KSA context. Three axes were identified. First, teachers’ challenges included a lack of time, a lack of professional training, and swimming against the stream. Second, students’ challenges involved weak literacy, power relations and the teacher as potentially one of the challenges. Third, challenges were presented by the textbook itself.

5.5. Chapter summary

This chapter considers the analysis of the thematic findings from the instruments of data collection that emerged inductively from the analytic findings. The data analysis process was done in a holistic way to try to provide a rounded perspective on teachers’ and students’ experience within the KSA primary curriculum context. In the following chapter, case studies and interpretation will be presented.
Chapter Six

Case studies and interpretation
6.1. Introduction

In this chapter, the main aim is to achieve an in-depth data analysis regard teachers’ and students’ experiences of teaching and learning thinking skills in the KSA context. A summary of all seven cases will be followed by an in-depth examination of the data collected from two cases selected as particular examples. Throughout the analysis, the findings indicated that the seven cases could be grouped into two patterns: progressive cases and traditional cases.

The progressive tendency was shown more in cases 3, 4, 6 and 7. These four were similar in that they were very good at addressing thinking skills in the classroom and smoothly incorporating thinking skills activities into their lesson practices. Case 3 will be presented as an example of the progressive case group. On the other hand, the traditional tendency was shown to a greater extent in cases 2 and 5. Case 2 will be presented as an example of this group.

The main reason for choosing one particular case as representative of its group was to make use of the rich data which was obtained from this case, whether based on the interviews, classroom observations, or/and group discussions for both teacher and students. This classification enabled me to go in-depth, aiming at a better understanding of thinking skills phenomena in the classroom.

6.2. Overall summary for all seven cases

As discussed earlier, the sample in this study consisted of seven case study classes of male students from the upper years in primary schools in the KSA, aged 10, 11, and 12 years. In two of the case study classes, thinking skills were being taught within the science curriculum, while in the other five case study classes, thinking skills were being taught within the Islamic education curriculum. There was one case teacher for each school. All data were conducted by the researcher himself. The average number of visits by the researcher was approximately three (3) for each case. (More details may be found in Appendix 12).

The cases are listed in the table below:
6.2.1. Brief description of each case

In this section, a summary of all seven cases will be proposed followed by an in-depth examination of two cases selected as particular examples.

6.2.1.1. Case One

Teacher Abdullah received his Bachelor of Science in Primary Education in 2007, and he had been teaching science for 3 years in three different regions. Teacher Abdullah taught in a class with 25 students; the desks were in five main groups and all the students in each group usually worked together when answering the exercises or teacher’s questions. Teacher Abdullah taught in a medium-sized formal school, usually using multimedia presentations by PowerPoint and sometimes using the whiteboard when he taught.

The most salient individual characteristics of case one were the following:

- The teacher regularly used a variety of appropriate techniques and strategies for teaching and learning thinking, such as used collaborative teaching methods in which students worked in groups or pairs for developing their thinking skills and collecting their ideas together by discussion and inquiry.
- The teacher regularly used dialogue through which he described the main points of the lesson, collected students’ ideas and developed their thinking skills by discussion, inquiry and asking high level questions.
• There was evidence of the existence of a friendly relationship between the teacher and students.
• Some conflict existed between the teaching of academic content and the teaching of thinking skills.
• Sometimes the teacher experienced a lack of time for teaching thinking skills.
• There was evidence of the negative impact of weaknesses in writing, spelling and reading on the development of thinking skills.
• One of challenges to the development of thinking within the group was pressure from the group or excessive competition. For example, in competition time students searched for information by reading through the book and presenting any information instead of thinking carefully about the information.

6.2.1.2. Case Two

Teacher Shadi had obtained his Bachelor of Islamic Education in 1996, and he had been teaching Islamic Education for 14 years in three different countries. Teacher Shadi taught in a class of 25 students; the students’ desks were arranged in rows facing the major instructional area. Teacher Shadi taught in a medium-sized formal school building and usually used the board when he taught. The most salient individual characteristics of case two will be discussed later at Section 6.3.2.1 as it constitutes a traditional case example.

6.2.1.3. Case Three

Teacher Saleh received his Bachelor of Islamic Education in Primary Education in 1980, and he had been teaching Islamic Education for 30 years in different countries. Teacher Saleh taught in a class with 25 students; the desks were arranged in a half circle. Teacher Saleh taught in a large formal school building. The characteristics of case three will be discussed later at Section 6.3.1.1as it will be as example of progressive cases.
6.2.1.4. Case Four

Teacher Ryan had obtained his Bachelor of Islamic Education in Primary Education in 2005, and he had been teaching Islamic Education for five years in two different countries. Teacher Ryan taught in a class with 25 students; the desks were usually grouped into five main groups, all the students in each group usually worked together when answering the book's exercises or teacher's questions. Teacher Ryan taught in a large formal school building.

The salient individual characteristics of case four were the following:

- The teacher regularly used a variety of appropriate techniques and strategies for teaching and learning thinking such as used collaborative teaching methods in which students worked in groups or pairs for developing their thinking skills and collecting their ideas together by discussion and inquiry.
- The teacher regularly used dialogue through which he described the main points of the lesson, collected students' ideas and developed their thinking skills by deliberation, inquiry and asking high level questions.
- Teachers directed students to use the language of thinking.
- There was evidence of the negative impact of weaknesses in writing, spelling and reading on the development of thinking skills.
- There was evidence of the existence of a friendly relationship between the teacher and students.

6.2.1.5. Case five

Teacher Mohammad received his Bachelor of Islamic Education in 1995, and he had been teaching Islamic Education for 16 years in different countries. Teacher Mohammad taught in a class with 20 students; the desks were arranged in which rows facing the main instructional area. The majority of students usually worked individually when answering the book's exerciser or teacher's questions. Teacher Mohammad taught in a medium-sized formal school building, usually using the board when he taught.

The most noticeable individual characteristics of case five were the following:
• Collaborative teaching methods were used sometimes, in which students worked in pairs for developing their thinking skills and collecting their ideas by discussion and/or inquiry.
• There is clear evidence of the importance of external motivation.
• There was evidence of the negative impact of weaknesses in writing, spelling and reading on the development of thinking skills.

6.2.1.6. Case six

Teacher Fahd had obtained his Bachelor of Science in Primary Education in 1992, and he had been teaching science for 18 years in different countries. Teacher Fahd taught in a class with 27 students; the desks were arranged in rows facing the main instructional area or sometimes formed into six main groups. Sometimes the students worked individually when answering the book’s exercises or teacher’s questions, at other times they worked together in their group when the style of lesson demanded it. Teacher Fahd taught in a large formal school building, usually using the board when he taught.

The most notable individual characteristics of case six were as follows:

• Collaborative teaching methods were used sometimes, in which students worked in pairs for developing their thinking skills and collecting their ideas by discussion and/or inquiry.
• The teacher regularly used a variety of appropriate techniques and strategies for teaching and learning thinking.
• There was some conflict between the teaching of academic content and the teaching of thinking skills content.
• The teacher always suffered from a lack of time for teaching thinking skills.

6.2.1.7. Case seven

Teacher Nasser received his Bachelor of Islamic Education in 1991, and he had been teaching science for 19 years in different countries. Teacher Nasser taught in a class with 25 students; the desks were arranged in rows facing the main instructional area. The majority of students usually worked together when answering the book’s exercises or teacher’s questions. Teacher Nasser
taught in a medium-sized rented school building, usually using multimedia presentations by PowerPoint and sometimes the board when he taught.

In this case, included the teacher used collaborative learning as the main method throughout all his lessons. Also, dialogue was always used in the classroom, whether between the teacher and a student, students and students, or the teacher and groups of students. There was an interesting interaction when the teacher used collaborative learning in that each group resembled a workshop with students asking his colleagues if they understood, particularly the answer to the teacher's question. In case 7 classes there were four main large desks which covered more than half of the hall and the rest of the space was used for the teacher and the group nominees.

In this connection, case 7 is the one of best cases regarding organization, because this class was more organized compared with other classes in that all groups were fixed throughout the school year, and their seats were also fixed. There was a clear system for all to follow, including the bonus system and the appointment of leader. All these factors contributed to saving time and produced greater group sympathy in the case of collaborative learning.

The most notable individual characteristics of case seven were as follows:

- Collaborative teaching methods were used always, in which students worked in pairs for developing their thinking skills and collecting their ideas by discussion and/or inquiry.
- The teacher regularly used a variety of appropriate techniques and strategies for teaching and learning thinking.
- The teacher did not suffer from a lack of time for teaching thinking skills.

6.3. Case Examples

In this part of the study, a narrative approach is adopted as the framework for the case studies, as a form of analytical theoretical perspective. According to Elliott (2005: 5), since 1993, narrative has become a milestone as part of a methodological toolkit for qualitative researchers. "Narratives can be defined as discourses with a clear sequential order that connects events in a meaningful way for a definite audience" (ibid: 36). A significant relationship with narrative analysis for this study is narrative based on life experiences, as
pointed out by Webster and Mertova (2007: 7) "is based on the respondent's life experiences and entails chosen parts of their lives".

In addition, Webster and Mertova (2007: 3) argue that narrative "provides researchers with a rich framework through which they can investigate the ways humans experience the world depicted through their stories". This is illustrated in this study where the narrative can be seen as the essential framework of analysis for teaching and learning thinking skills in the classroom for these case studies. The aim of selecting two cases from the seven was to enable a more thorough study yielding a better understanding of both teachers’ and students’ experience of teaching and learning thinking skills. As a result, the rationale for adopting a narrative analysis is that narrative is an effective way of gaining an understanding of the participants’ experiences of dealing with thinking skills in the classroom.

In addition, the data analysis process revealed features of the classroom thinking skills practices which were then used to classify the study cases into three groups: traditional, mixed and progressive. The seven cases were analysed in relation to four areas that reside in the classroom and which are essential in the process of teaching and learning thinking skills, obtained from the experiences of both teacher and students. The four overarching themes of this framework of instructional practices include:

- Teachers embracing the infusion approach to thinking skills via textbooks;
- Teachers’ and students’ complementary roles;
- Spiritual/cultural inner motivation;
- The effects of teachers’ and students’ identities on their performance of thinking skills.

In order to categorise the seven cases into ‘progressive’, ‘mixed’ or ‘traditional’, the study used 66% as a ‘cut-off point’. Where 66% or more of the four areas mentioned above were present, the case was described as ‘progressive’; where between 33-66% of these practices were found the case was ‘mixed’; and where only 33% or less, the case was described as ‘traditional’ (see Table 6.2).
The main four themes

<table>
<thead>
<tr>
<th>Number of Case</th>
<th>Teachers embracing the infusion of thinking skills</th>
<th>Teachers’ and students’ complementary roles</th>
<th>Spiritual/cultural inner motivation</th>
<th>The effects of identities on performance of thinking skills</th>
<th>Type of practice (progressive / mixed / traditional)</th>
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<td>Consistency</td>
<td>Consistency</td>
<td>Progressive</td>
</tr>
</tbody>
</table>

Table 6.2: Categorisation of cases by types of practice

After finishing the data analysis, and to be sure about what constituted a progressive case or a traditional case I used a comprehensive approach developed by Beyer (1997) as a framework to describe instruction to improving student thinking. Using Beyer’s approach enabled me to distinguish between traditional cases and progressive cases.

The main themes of this comprehensive approach include:

- Making thinking visible and explicit;
- Providing thoughtful learning environments;
- The teacher’s role in guiding and supporting student thinking;
- Integrating instruction in thinking with subject matter.

The key practices in this approach of instruction in thinking skills include:

- Providing opportunities for student thinking;
- Encouraging student thinking;
- Scaffolds for student thinking;
- Cueing student thinking;
- Process-structured questions.

Observations of each case involved a range of elements which contained practices, thinking skills construction, and thinking skills transmission. The findings of the analysis of the observations show that the cases could be classified into two groups: traditional and progressive (see Figure 6.1).
Types of practices: Traditional          Mix          Progressive

<table>
<thead>
<tr>
<th>Cases:</th>
<th>2</th>
<th>5</th>
<th>1</th>
<th>4</th>
<th>6</th>
<th>7</th>
<th>3</th>
</tr>
</thead>
</table>

Figure 6.1: Types of practice in each case regarding teaching / learning thinking skills

As shown in Figure 6.1, the findings of the observation analysis indicated that the seven cases could be classified into two types: traditional and progressive practices.

6.3.1. Progressive cases

In this category, teachers viewed the teaching and learning of thinking skills as a constructive process in which it was essential to engage the previous experience of the learner. Teachers also encouraged sharing between themselves and their students. Teachers were seen as guides to the learning process in the classroom rather than as the main source of knowledge.

Within case studies 3, 6 and 7, there were many similarities in the application of thinking skills which could be classified as progressive.

6.3.1.1. Case Three

Case 3 school is a primary school, of average size, the building having two floors built in 1997. It serves the district of central Buraidah, the capital of Al-Qassim County in north central of the KSA. Al-Qassim is one of the thirteen administrative counties of the KSA with a population of about one million with more than 50% of the population residing in Buraidah city (2010 census), and with an area of about 65,000 km². The socio-economic background of the school’s intake is mainly middle class with a few upper class children (more detail of the socio-economic background will discussed later, in Chapter Eight Section 8.2.2). It has about 370 boys between the ages of six and 12 years, and 42 teachers. There are no teaching assistants. The weekly timetable includes six lessons per day, on average, with forty-five (45) minutes for each lesson; each subject is taught by a specialist teacher with a Bachelor’s degree. Teachers and students are committed to the school textbook, which is
distributed free to the students by the Ministry of Education, and which is supposed to be completed by the teacher within the specified time during the academic year. Thinking skills are built into the textbooks as an infusion approach.

The school atmosphere in case 3 had a fundamental influence on teacher Saleh’s views and practices of teaching thinking skills in his class, in that a culture of skills development, especially thinking skills, was part of the school atmosphere:

‘...The school began to talk about thinking skills and creativity, as the school environment made new things in myself, in terms of what I could give these students’. (Case 3, Teach S, int 1, p. 9 L. 12 - 14)

It seems to be that the social environment of the classroom is in itself an important aspect. The teacher needs to have good quality opportunities available within his working atmosphere in order to work at the appropriate level.

Supporting this view, one of the most important extra-curricular programmes - relating to thinking skills development- was established in this school, constituting one of the main factors which increased the opportunities for students to develop their thinking skills. Students who worked with thinking skills extra-curricular programmes were easily able to deal with the exercises in the thinking skills textbook and were easily able to understand, as well as use, the language of thinking as was mentioned in the “Factors” section in Chapter Five.

As mentioned earlier, case 3 is presented as an example of a progressive case. The classroom is smaller than the national average, and situated on the ground floor of the school. The classroom benefits from large bay windows providing a good natural light. In case 3 classes students’ desks were arranged in a U-shape or a half circle with one line inside this circle because of the number of students in the class, as shown in Figure 6.2.
This classroom arrangement allowed students to face each other; this seating arrangement helped students to engage in different thinking skills tasks and facilitate student interaction. In particular, teacher Saleh usually applied higher level questioning and dialogue strategy. Students’ desks took up about two-thirds of the classroom size, while the remainder of the area of the classroom was a corridor, and the area available for the movement of the teacher. The teacher’s desk was in the corner of the room. This classroom provided good central air conditioning; both the teacher’s and student’s desks were in good condition. On the walls of the room there were posters quoting sentences about creativity, such as: 'Creativity is a way of thinking differently from the usual', 'Creativity is not limited to creator or talented or top students', 'In order to develop your idea: record and write it' and 'Intellectuals are the real wealth of the nation'.

The number of students in case 3 was 25. Teacher Saleh believed that this large number was an obstacle to the development of thinking skills, and he said:

‘If we want to develop thinking skills the best numbers are between 15 to 20 students at the upper limit. … [25 students] It’s an obstacle to give what I have and I wish, but it will not stand as an obstacle to give them many of the ideas that I want to share with them. But with 15 students I can give most of what I have and I wish, but if you have 20-25 students it will not stop my mind but, I
cannot give them most of what I have.’ (Case 3, Teach S, int 1, p. 13 L. 31 - p. 14 L. 1)

Teacher Saleh emphasized that student numbers imposed a constraint on the interaction between teacher and students, and between students and students. It was also the main reason for the lack of time. In addition, the classroom, which was on the small side, was a hindrance for teacher Saleh, in that he was forced to create a line of desks in the middle of the class:

'I believe that the classroom size is not enough to practice activities and [to do] even a quarter of what I want to do.’ (Case 3, Teach S, int 2, p. 6 L. 21)

A further problem in the classroom was the lack of useful rich material as a resource for learning, in that the teacher only used the textbook as a resource for learning thinking skills. This point was raised by one of the students when he compared the extra-curricular programmes and his classroom, as mentioned previously in the “Factors” section in Chapter Five.

Teacher Saleh had positive views of his students, believing that every student had a number of thinking skills. This optimism and confidence in the ability of his students had a great influence on his interaction with his students and it was reflected in the way he dealt with thinking skills in the classroom. It also contributed to the enjoyment of the lessons:

'Students are creators and I stressed this strongly ...I have a conviction which is that successful lives are the creative ones. So, how can I be successful with these students? I believe that it’s necessary to let students go into a series of creative activities and develop their thinking skills; so I use higher-order questions and answers, which I feel will open the students’ minds. Because the students are creators, so, if I continue to engage in dialogue with them, they will continue. ... Once the student’s thinking starts flowing, the student doesn’t stop!’ (Case 3, Teach S, int 1, p. 6 L. 27 - 38)

Side-by-side with this optimistic view and high expectation of student ability, the teacher always confirmed that he had his own theory which was that: ‘we are equals’. That meant, as he said:

'I want to develop his skills of thinking, so I will tell him “You’re going to university!” If I told him I’d take him to the university, the student feels equal to me. Because my theory - that I apply - is that I tell them “You are equals”. I always tell the students that they equal me. I give you an example of my theory, since you live with us, Did you see one who was reprimanded during the previous lesson?’ (Case 3, Teach S, int 1, p. 3 L. 38 - 45)
This theory encouraged initial student engagement in thinking tasks, and maintained their activity throughout the thinking skills operations. It seems to be that the teacher saw his role as facilitating, guiding, supporting and participating in student thinking tasks, creating the best learning atmosphere possible:

’If the notes of the students give me their answers, my responsibility is to focus on explanation and answers at the same time. I’m sure to take it - answers - from the mouth of a student’. (Case 3, Teach S, int 1, p. 11 L. 15 - 17)

The teacher also had beliefs about individual differences among students when dealing with thinking skills and he addressed these by using a variety of methods, and giving more than one opportunity to rethink. For example, when the teacher saw students raising their hands to answer a question too quickly, and the teacher said: Be patient, give your colleagues a chance to answer, give them more time (Case 3, Class Ob 3, p. 9 L. 21-29).

In light of the above, the teacher’s positive views and his conception of his role as facilitator contributed to students playing active roles in case 3’s classroom.

Teacher Saleh showed enjoyment when he was dealing with thinking skills exercises; he believed that teaching and learning thinking skills were of the utmost importance in the academic context of the classroom:

’I really, really I care a lot for thinking skills - why? Because the curriculum will be lost. How? Because the student, after a month or two months, will forget the information, but the development of his thinking skills will stay and continue with the student.’ (Case 3, Teach S, int1, p. 6 L.24-26)

Teacher Saleh viewed the development of thinking skills as a constructive process:

’Without doubt the process of building and developing the thought processes of the thinking skills is a constructive process and threaded through the cultural and social environment.’ (Case 3, Teach S, int2, p. 5 L.24-25)

This view was reflected in applying a variety of strategies of teaching thinking skills in the classroom, as will be discussed later.

For their part, the students’ view about the thinking skills process was that they enjoyed it when dealing with the thinking exercises. More than once: most of the students were busy answering the exercise questions. They showed more interaction when dealing with thinking skills and were always
asking or answering higher level questions. The most of them loved doing the exercise questions, as many of them told me several times (Case 3, Class Ob 1, p. 1 L. 14-23).

In each lesson throughout all observations of teacher Saleh’s classes, the teacher dealt with the main points regarding the subject of the lesson. Each point involved a different technique or strategy using different thinking skills, by the teacher creating his own questions, as he mentioned in many parts of the lessons, aiming to develop his students’ thinking skills. Also, he used these questions as an introduction to the lesson or as initial points for subsections of the lesson. After each question, a student would answer and then the teacher provided feedback or asked another student to assess that student’s answer.

The teacher applied a variety of techniques and strategies to develop thinking skills, depending on the nature of the topic of the lesson, such as dialogue, collaborative learning, asking or answering higher-level questions and using a variety of means of motivation. Also the teacher often tried to work at guiding and supporting student thinking. Teacher Saleh always strongly supported the use of higher level ‘thoughtful questions’ and dialogue strategy. He believed that higher-order questions and using dialogue were the best methods of developing thinking skills, as expressed in the interview:

‘I believe that dialogue is the best way to develop thinking skills; the student will be very, very open-minded.’ (Case 3, Teach S, int 1, p. 13 L. 30 - 31)

‘I use higher-order questions and answers, which I feel will open the students’ minds. Because the students are creators, so, if I continue to engage in dialogue with them, they will continue.’ (Case 3, Teach S, int 1, p. 6 L. 34 - 36)

At various times he asked students to sit with each other to facilitate collaborative learning, in which students worked in pairs for developing their thinking skills and collecting their ideas. He helped them work with others effectively. I noticed that there was an interesting interaction when the teacher used these strategies.

As mentioned earlier in this section, teacher Saleh used a variety of techniques for teaching thinking skills, such as using scaffolding, cueing, giving enough time, using the language of thinking, giving feedback, competing strategies, and step by step techniques. All of those were discussed in the ‘Experience’ section. However, in this section I will focus more on five techniques which teacher Saleh used regularly: higher-level questioning
strategies, scaffolding, cueing, using the language of thinking and giving enough time.

**Higher-Level Questioning Strategies:** Higher-level questioning was shown to be an essential strategy applied in case 3 which assisted in establishing opportunities for higher-order thinking. In my observations in case 3 I noticed there were waves of questions throughout the lesson; these questions not only came from the teacher (as in some other cases, such as case 2, which will be discussed later) but they came from the students more than the teacher. Good questions coming from the students were dealt with by encouragement and guidance from the teacher and/or leading the students’ waves of questions. These questions involved several thinking skills and they represented the best opportunities for the growth and development of thinking skills. The waves of questions did not subside because they also came from the students themselves, and the teacher used these questions to explain the content of the lesson, as well as to encourage the students to refine and develop their questions (Case 3, Class Ob 2, p. 3 L. 35-40).

Three main techniques were used when the teacher dealt with higher-level questioning, as follows:

- **First phase:** ‘trigger question’ the teacher created his own question, or he chose one of the students to create his own question and ask his classmates regarding the lesson topic, to prompt student thinking.

- **Second phase:** ‘thinking question’ the teacher led the students’ waves of higher-level questions, in that the teacher encouraged students to ask higher-level questions, listened for the students’ ideas and asked and negotiated with them. The teacher, also, in this phase tried to ascertain whether students were aware of the aim of the question or whether there were any misconceptions.

- **Third phase:** ‘thinking about question or answer’ the teacher applied a variety of thinking skills by encouraging students to answer the question without giving the answer himself. Thus the questions in this phase went beyond the recall level, such as asking students to develop their classmates’ questions/answers or even to criticise their questions/answers, asking for evidence to be presented. In addition, teacher Saleh regularly tried to benefit from previous experience by using it to build new knowledge through a variety of thinking skills.

Throughout all phases of questioning, teacher Saleh regularly applied a dialogue strategy, whether it was between the teacher and students or among the students themselves. Furthermore, through the second and third phases,
teacher Saleh used a variety of strategies and techniques, such as scaffolding, cueing and giving enough time. Later in this section, scaffolding and cueing will be discussed further as teacher Saleh used them regularly and they had a positive influence on promoting students’ thinking.

Teacher Saleh’s strategy for selecting students’ questions was that he selected them on the basis of many criteria, such as students’ abilities, in light of individual differences. Also, teacher Saleh regularly encouraged all students to ask questions and tried to take answers equally from all students in different parts of the classroom; he treated all students equally, not preferring one over the other.

Teacher Saleh’s justification for using higher-level questions in his classroom was that they prompted and improved students’ thinking operations:

‘My view is that when I ask the student many, many questions, I’m sharing the movement of his mind. If I begin to send, and send only without dialogue, the student will be tired and his ability in thinking skills will not grow.’ (Case 3, Teach S, int1, p. 12, L. 20 -24)

Applying a variety of techniques and strategies had an influence on students, one of which was to elevate their answers and their learning. One of case 3’s students, “Ayyaf”, on whom I was focusing, when asked about the source of his higher-level questions, said:

‘From the teacher’s method of explanation. The student asks, and I wait and look for his questions and choose the best and I develop it and ask it.’ (Case 3, St Ayyaf, int 1, p.2 L. 16 - 18)

Other students throughout the group discussion emphasised that:

**Student (Shraideh):** There is one teacher who asks questions all the time and then my mind unfolds, in contrast to another teacher who is fighting questions, and my mind starts closing slowly. (Case 3, Group D 1, p. 2 L.15-17)

From the above, it seemed to be the teacher’s application of a variety of techniques and strategies of explaining the subject, by using higher-order thinking skills, that had a large influence on students’ ability to employ thinking skills themselves.

Furthermore, teacher Saleh believed that the students felt relaxed and comfortable when asking questions, and that the teacher answering students’ questions would contribute to increasing the level of student questions:
'The first point is the comfort of the student when asking the question; and he
knows he will not be reprimanded or admonished or mocked, and I really
assume the importance of it to be about 60%; The second point: that when the
student is asked he will find proper answers between 70 to 90% of their
questions;’ (Case 3, Teach S, int 2, p. 5 L. 27 - 34)

This view was applied in case 3’s classroom, as I noticed though classroom
observation: One of students, “Ayyaf”, on whom I was focusing, asked a
question opposed to the teacher's question, and gave his own explanation.
After the teacher had replied to his question, the student was not satisfied,
and responded to answer the teacher using upside down thinking (Case 3,
Class Ob 2, p. 5 L. 42- p. 6 L. 4).

Another element in creating the best atmosphere for students to ask higher-
level questions came from a group discussing findings which it related to the
effect of opening the door to questions on developing the students’ thinking
skills:

Student (Said): … The third type of teacher is one who helps me in everything,
does not hit, allows me to ask any questions without feeling nervous and this
develops my thinking skills. (Case 3, Group D 1, p. 2 L.3-14)

Furthermore, teacher Saleh believed that, to encourage students to present
their answers, it was essential never to say that the answer was wrong, as this
would inhibit students’ thinking skills:

'I’ve discovered, after 30 years of service, that the student wants you to open
everything to him, and when he answers not to say “This is wrong”, instead
say “That’s great but I want the best answer”, so he will be encouraged…which
means these students - if they went to another teacher who might inhibit their
thinking freedom - that will lead to stopping their thinking.' (Case 3, Teach S.
int1, p. 1 L. 38- 42)

'The most important thing I have is what is going on in the mind of the
student, and I try to develop what is going on in his mind, even if it is wrong.
Because it is sometimes 60% of the general answer that is not correct but 40% is
correct. So I cannot say it is wrong or a mistake. This is suppression.' (Case 3,
Teach S. int2, p. 1 L. 23- 25)

The effect of this element is shown in this quote:

'The teacher Saleh says I have all the answers right. For example, if my
colleague’s answer is not complete, he says that this is true, and if another
colleague’s answer is better than the first, he says this is better, and he says that
both are correct. … If there is a question I do not hesitate to answer; I
immediately answer and this gives me the comfort and freedom to say what
comes in my mind. Also it contributes to my thinking and I do not stop.’ (Case 3, St Ayyaf, int 1, p.4 L. 17 - 27)

As a consequence, four elements were applied in case 3’s classroom which had a significant influence on students’ higher-level questioning: opening the door to questions, the student feeling relaxed and comfortable when asking a question, the teacher answering students’ questions, and encouraging students to answer, and never saying that the answer was wrong. These elements applied in case 3’s classroom and they encouraged students to develop their thinking level as a normal element of the learning process.

**Using the scaffolding technique:** Teacher Saleh frequently used particular ways of developing students’ understanding and thinking skills, such as critical thinking, problem solving, classification, justification and elicitation. As mentioned earlier in the ‘Experience’ section, throughout case 3’s lesson observations, the teacher’s ‘five rules strategy’ used scaffolding as the main aspect of mediation. Also, it assisted and prompted students to present the requested information in the lesson.

Teacher Saleh more than once wrote five categories on the blackboard and asked students to classify the topic of the lesson according to the ‘five rules’. The five rules are the principles of jurisprudence in Islamic law:

‘I tell students that the first is Obligation; so this is number one. Then what should be the opposite? This is number two and the opposite is completely prohibited, so that the student knows the definition of obligation and knows the definition of the reverse. Then comes one which is less than Obligation, which is Desirable, and the opposite which is less than prohibited, which is Abomination – dislike to do. Then comes the one in the center, which is permitted – you are free to do. By these five rules, the student will understand, so they are imposed in all places of Islam law; that is to say: prayer is obligation: theft is prohibited…, so that the student relates the rule and actual life.’ (Case 3, Teach S, int1. p. 4, L. 30 - p. 5, L3)

The five rules enable a ‘bridging’, which helps to define and understand the learners’ immediate thinking skills needs and gives them a wide set of dynamic rules that will enable them to identify and apply the law in new situations. Both the teacher and students believed that using the ‘five rules’ techniques had a beneficial influence on the students’ learning skills. Throughout the classroom observations, I noticed that: the teacher made a link between one of the students’ questions and the five rules of the principles of jurisprudence: obligatory, desirable, permitted, prohibited, and abominable. Starting from here, he extended the ideas to various aspects of the development of thinking skills, like classification and decision-making.
Thus, students started trying to classify what they knew about the subject of the lesson and placed it within Islamic law by the use of the five rules. I noticed that the teacher succeeded in establishing a new understanding of a given situation from the old rules and then created several other situations linked with the first ’original’ one (Case 3, Class Ob 2, p. 1 L. 21-29).

Cueing techniques: Cues are “useful for what they help students remember to do” (Beyer, 1997:227). As previously indicated, the importance of using cueing was shown when students were not able to remember what they were supposed to do. When a teacher used cueing, the students were able to begin answering the exercise or question independently. So, cueing serves to ‘trigger’ thinking.

Teacher Saleh often used symbols, that is, hand movements to suggest information relevant to the lesson’s topic, which helped the students to recall the specific information and thus answer the question.

During lesson observations, it was noted that using symbols was useful in that they prompted particular students’ thinking as a step in the teaching and learning of thinking skills. As I wrote in the second classroom observation … The teacher symbolized by specific movements that each movement reflects the requirement to be achieved when worshipping according to Islamic law. If the teacher symbolizes the movement, the students give specific conditions regarding this symbol (Case 3, Class Ob 3, p. 9 L. 9-14).

It seemed to be the teacher was employing cueing as a tool in order to guide and support student thinking. He used cueing to help students in transferring and ‘bridging’ what was stored in their memories, by selecting the relevant information. Supporting this view, during classroom observations, I noted that one of the students in case 3 was asking good questions and making valid assumptions. When asked about this in the interview, he said:

‘The teacher gives me comfort and freedom to say anything, and gives me time to think about it. He uses cueing, symbols, and signs such as that “mind is a condition for the Islam rule”, and he used symbols for it. …He uses the symbol if we can’t answer; the teacher refers to the symbols and then I remember the rule and then I raise my hand and I’ll answer.’ (Case 3, St Khaddiri, int 1, p.1 L. 21 - p.2 L. 7)

It seemed to be that the student responded to this cueing as a tool to develop his thinking skills, and it assisted him in successfully completing his task.
In general, it could be argued that there was a clear impact of internal factors on teacher attitudes when dealing with thinking skills; for example, Saleh’s belief system seemed to have a great influence on his teaching of thinking skills. The system of Islamic law had a strong influence on Saleh’s attitude when teaching Islamic education. This was notable through the interaction between Saleh’s belief system (how he understood Islamic law) and his teaching practices in classroom. This was one of the obvious effects of teachers’ Islamic views on the way they developed thinking skills in their students. This important element was discussed earlier, in the “factors” section in Chapter Five.

**Using the language of thinking:** The teacher often spoke about the importance of developing students’ thinking skills. He also encouraged the use of thinking language by explaining the meaning of certain thinking skills terms, such as critical, creativity, problem-solving skills, by explaining their importance and their role in developing understanding. He then gave examples and explained the reasons, if needed.

**Giving enough time:** Although teacher Saleh mentioned more than once that the most significant obstacle was a lack of time, the students, in general, were given enough time when dealing with thinking skills. It was previously indicated that this element was essential, as reflected in practice earlier in Chapter Five.
Throughout all observations of teacher Saleh’s classes, the teacher applied a variety of thinking skills to the main points regarding the subject of the lesson. During the classroom observations, I noted that the majority of the questions could be classified as using thinking skills. Consequently, many times the teacher asked students to be critical of other groups’ answers, justifying their criticisms, and then presenting their own answers to improve on it. The teacher also asked students to summarise the answers of their colleagues, as well as asking particular students to be critical of other students’ answers, to clarify terms or identify assumptions in a situation.

Other aspects of the application of the thinking skills process were shown when the teacher dealt with thinking skills at the same time as dealing with the textbook’s academic content. At this point I noted that, throughout all observations of teacher Saleh’s classes, he created his own questions which, as he mentioned in the lessons, aimed to develop his students’ understanding and/or to modify any misconceptions of the textbook’s academic content.

The teacher, frequently throughout all observations, strongly supported a safe environment in the classroom for developing students’ thinking skills and
creating the best opportunities for the growth and development of thinking skills. He showed awareness of the importance of ensuring a suitable classroom climate for the development of students’ thinking skills as well as minimizing the negative aspects of “power relations” through engaging in the thinking process.

Furthermore, more than once the teacher showed awareness of the importance of answering students’ questions; so, students usually feel safe and comfortable when asking a question. They also felt they had the freedom to ask any question, even if it looked like criticism. The teacher aimed to help the students to express their ideas openly with free expression:

‘I do not mind that the student is asking or putting anything up even against religion because the student is learning through this class and if he is given complete freedom he will say what he thinks, then I am only required to make corrections to that. So, the teacher of Islamic education in particular must have these pictures.’ (Case 3, Teach S, int 2, p. 4 L. 29-32)

Supporting this finding during lesson observations, it was noted that: The teacher always encouraged students to answer the questions, and he never said that the answer was wrong. On the contrary, he said many times "beautiful answering but we need more than beautiful", or sometimes he said "grateful, excellent, and wonderful". This style of encouraging students had a great influence on them in different ways, one of which was to encourage students to continue thinking. As an example of this, the face of one student, "Muath", when he was trying to think said “a a a” and he bit his lips and at the same time hit his chin slowly with his finger(Case 3, Class Ob 1, p. 1 L. 36-42).

Teacher Saleh believed the teacher’s role was the foundation upon which the students’ thinking skills developed, in that the teacher is responsible for 80 to 90% of the task of developing thinking skills. He saw the role of the teacher as a guide and contributor to the classroom environment to ensure support and promote the development of students’ thinking skills processes. In each lesson throughout all observations of teacher Saleh’s classes, there was a good classroom environment. I noted the following:

- The teacher tried to provide the best kind of learning atmosphere to encourage thinking operations in his classroom.
- The teacher tried developing students’ thinking skills in different ways and most of his questions could be classified under various thinking skills
headings. Also, the teacher sometimes asked students to identify his assumptions or to support their answers with evidence and justification.

- The teacher explained the difficult terms which were involved in some of the teacher's or students' exercises/main questions.
- The teacher always answered students’ questions so that students felt comfortable when asking questions.
- I noticed that there were individual differences between students which the teacher often tried to take into account by asking specific questions, such as to criticise or rearrange.
- The teacher often discussed issues in the classroom which were outside the formal curriculum.
- I noticed that there were many students who evaluated the question or answer of their classmate, then thought up their own issue or question.
- The teacher always encouraged students to be thinkers, and talked more than once about the importance of developing students' thinking skills as this would help them in different aspects of their lives.
- The teacher supported the development of thinking skills by encouraging his students to think independently without consulting the textbook, such as by encouraging students to present a unique definition of a term which was related to the lesson.
- The teacher saw himself as a facilitator and organiser to naturally lead the students to develop their thinking skills.
- The teacher tried to make students the focus of the thinking skills operation, side-by-side with the academic content, using students’ previous experience.
- The teacher tried to assist students in focusing intentionally on how thinking operations work and supporting them structurally.

A friendly relationship between the student and teacher is important for the increase and improvement of students’ thinking skills. Throughout all observations I noticed that, with a friendly relationship, the students felt comfortable when asking questions because of the non-threatening environment. Students knew that their questions would be answered and they felt that there was respect between themselves and the teacher. A friendly relationship not only has effects on the student, but also has effects on the teacher Saleh, which affects the quality of the teacher’s output.

In case 3 there were a number of difficulties that faced both the teacher and students. For the teacher, two main challenges were a lack of time and the continuous assessment system while, for the student, the biggest difficulty facing them was the power relations with the teacher. These were discussed earlier, in the “Challenges” section in Chapter Five.
6.3.2. Traditional cases

In this category, teachers were seen as controllers of the learning process in the classroom and the main source of knowledge, rather than as guides to the learning process. Strategies and techniques for teaching included the use of lecturing as a central method for transmission of knowledge to students, which lacked opportunity for dialogue, for developing thinking skills, or for students to solve the exercises themselves. Within case studies 2 and 5 there were many similarities in the application of thinking skills which could be classified as traditional.

The reason why the narrative of the traditional case is less full than for the progressive cases was to a large extent due to the richness of the teacher’s and/or students’ information. The teacher’s and students’ interaction with me, the time available for the interview and classroom observation, and conditions of the teacher, students and the school, were influential here.

6.3.2.1. Case Two

Case 2 school is an average-sized primary school consisting of three floors. This school covers six grades and has approximately 270 students with 25 classroom teachers. It is situated in a suburban area to the north of Buraidah. The socio-economic background for case 2 students is middle class in general (more details of the socio-economic background will be discussed later in Chapter Eight, Section 8.2.2). The weekly timetable and use of the textbook are like Case 3’s.

The classroom has large bay windows which provide a good natural light, and it also benefits from air conditioning. Both the teacher’s and students’ desks were in good condition. The teacher’s desk was small and situated in a front corner of the room. Students’ desks were arranged in rows in front of the board. Students were facing the whiteboard as shown in Figure 6.4. Mostly teacher Shadi stayed at the front of the class, but he sometimes walked among the students’ desks.
Teacher Shadi was teaching a class with 25 students. As with case 3’s teacher, he believed that the number of students was a challenge to his teaching, and he said:

‘... Now in year fifth, there are 25 students, the class is full, and the students tire me. Honestly, I cannot give every student the right attention.’ (Case 2, Teach SH, int 1, p.6 L. 14 -16)

As mentioned earlier, case 2 will be presented as the example of the traditional case group. In contrast to case 3, a traditional school atmosphere with very formal relations between teachers and students had a huge influence on teacher practices in this class. The whiteboard was full of information written by the teacher, with the students only listening.

‘Explicitly, the pressure on teachers in general, which does not let them give the student the right to participate, is the pressure of the full timetable that makes the teacher exhausted from lesson to lesson. He will be tired; he just wants to finish what he has to do in any manner whatsoever; the important thing is to go to class and keep the time limit. This may differ from teacher to teacher, but in general teachers suffer from timetable pressure; you may find that the teacher has 20-24 classes per week. The pressure sometimes from the school administration, in that relationship between the school and the teacher becomes important, if the administration respects the teacher and gives him his rights, and treats them in a sophisticated and brotherly way, this gives the teacher a great motivation .’ (Case 2, Teach SH, int 1, p.5 L. 18 -21)
Although there were signs of weakness in advance planning, and poor monitoring of teaching thinking skills in the classroom, both the teacher and students believed that applying thinking skills in the classroom is important, 'an essential part' and 'the different levels of thinking should be embedded in the basics of the education process':

'I love it because it helps to increase my information, especially if someone asks me. It means I find many useful things and it helps me to develop my brain and develop my abilities and have new information... So I love the exercises very much.' (Case 2, St Samhan, int 1, p.3 L. 15 - 21)

Teacher Shadi is presented as expressing a traditional case that was mostly consistent with his instructional practices in the classroom. Through teacher Shadi’s practices, it could be argued that he supposed that lecturing is a central method for transmission of knowledge to students and it would be an effective method if students would listen to their teacher and pay attention to him. When asked about this observation, he replied:

'Sometimes I wish that I went on to speak and said my comments regarding the subject matter of the lesson ... it might be that one of students says: Oh teacher, the lesson has finished! Then I tell him: Do not be concerned with the lesson ... I will continue the lesson later.' (Case 2, Teach SH, int 1, p. 3 L.29 - 31)

This seems to be that, although the message of some students means that the teacher should go away, the teacher insisted on continuing. Likewise, in one lesson throughout the classroom observation, about 25 minutes of the lesson was spent with the teacher lecturing on the main title of the lesson with very little questioning or discussion. While, in another lesson he took about 22 minutes lecturing on the main topic. Although the total time spent explaining the lesson was 22 minutes, when the students tried to answer the textbook exercises their lack of understanding of the lesson was revealed, especially when the students had to use higher level thinking skills, such a critical or comparing skills through the textbook’s exerciser (Case 2, Class Ob 3, p. 3 L. 36-39).

It is apparent that this traditional teacher saw learning as a transmission of knowledge, centred round the teacher. Teacher Shadi appeared to believe that using the lecture as the main teaching method was the best way of teaching thinking skills, in that it took more than half the lesson for the teacher’s explanation that the lesson’s subject involved learning thinking skills.

Teacher Shadi used the lecture method in his class, with limited student participation in one part of the lesson where he mixed lecture with a little discussion, though he stressed memorization. These kinds of strategies and
techniques for teaching had limited effects when dealing with thinking skills. There were several limitations to the use of lecturing because this teaching method was based on recitation and just answering the teacher's questions, as result there was a lot of boredom evident among the students. The majority of the students were listening passively: After 10 minutes of the teacher's lecture, the students started to get bored. I noticed more than 5 students, some of them good students, starting to become absent-minded and some of them playing with their pens, and so on (Case 2, Class Ob 3, p. 3 L. 21-23).

A clear result of using the lecture method was widespread boredom among the students, as one of students said:

'Boring! Both lesson and teacher! I am out of the classroom; my body is in the classroom but my mind is outside. It's Boring. ... Bored, because I did not understand the exercises.' (Case 2, St Qaraawi, int 1, p.1 L.10 - 13)

Another result of basing the lesson on recitation regarding learning thinking skills was a lack of opportunity for dialogue and developing thinking skills, as well as a lack of giving students an opportunity to solve the exercise. So the students were not paying attention when the teacher was teaching. During these 7 minutes the teacher went through the 4 exercises. He started reading the first exercise, and at the same time answered the questions without giving students an opportunity to solve them or even to understand what they were all about. This had a negative effect, as I noticed that a large number of students did not write anything in the answer space. When I asked one of those students why he had not written the answer, he told me: “I did not understand how I should do it. It is difficult - and then I wasn’t paying attention” (Case 2, Class Ob 3, p. 3 L. 41- p. 4 L. 3).

In this regard, there may be numerous reasons why he might use the traditional approach when teaching. In an interview, when I asked about his university preparation, he said he had forgotten what they studied during their university preparation; additionally, he had not taken any courses at all during his 15 years of service. Both a lack of university preparation and absence of in-service training had a negative influence on teaching thinking skills for numerous teachers. During some lesson observations, it was noted that there was a lack of teachers’ experience in dealing with thinking skills, one of possibly that since they were not fully conscious of thinking skills benefits: During the lesson, the teacher went through the 4 exercises through just 7 minutes. He started reading the first exercise, and at the same time answered the questions without giving students an opportunity to solve them or even to understand what they were all about (Case 2, Class Ob 3, p. 3 L. 41- p. 4 L. 3).
There were several examples of a lack of teacher’s experience in dealing with thinking skills, particularly when he dealt with the textbook exercises. One example was that the students did not take too much time when starting answer exercise; so, the teacher moved through the exercises quickly. Then the teacher said too quickly which exercises the students should answer, resulting in a large number of students not catching what the teacher said, so they had to ask which questions to answer and some of their colleagues told them. As a result, there was not enough time. The teacher did not give adequate time to students to solve the exercises (Case 2, Class Ob 3, p. 3 L. 8-12).

Another feature of a lack of teacher experience in dealing with thinking skills was that the teacher’s style of teaching might be potentially one of the challenges to learning, in that he did not deal with thinking skills at the same time as dealing with the academic content and there was a lack of awareness of the importance of thinking skills in answering the exercises in the textbook. One of the students asked the teacher: “Oh, teacher, I haven’t finished the second exercise!” Then the teacher said: “Some of your colleagues have answered - that is enough!” (Case 2, Class Ob 3, p. 3 L. 30-32).

In the semi-structured interviews, teacher Shadi indicated that the time available to solve exercises had a direct influence on teaching and learning thinking skills. His view about the time effect was, he said:

’In my view time does not come with me … where there is not enough time even to read the text which interests me. Sometimes there’s no time, the time bothers me.’ (Case 2, Teach SH, int 1, p. 1 L.13 - 15)

However, this view of the time effect was not reflected in the way teacher Shadi applied thinking skills through the textbook exercises in the classroom. Throughout my classroom observations, I noticed that when the teacher finished explaining the lesson, he went on to answer the textbook’s exercises, but he allowed only about 7 minutes for answering 4 exercises. So, there was a lack of time available to solve the exercises; however, there was a bit of a shortage of time. The evidence for that is that the teacher finished the exercises with five minutes of the lesson still to go (Case 2, Class Ob 3, p. 3 L. 28-32).

As a result of the teaching in case two being based on recitation, and the teacher showing a lack of experience when dealing with thinking skills, the students’ learning was through absorbing the explanations of their teacher. Thus, there were challenges that faced students when they were learning thinking skills in this classroom. In addition to the lack of time mentioned
above, there was a lack of familiarity with the exercises, in that I noticed the students’ lack of knowledge of ways of dealing with thinking skills. When students were working on the exercises, I noticed that a number of students were not working on the correct exercise. The teacher had asked them to start with exercise 2 and many of them went to number 1. I interpreted this, as the teacher told me before starting the lesson that he usually did not deal with thinking skills at the same time as dealing with the textbook’s academic content, so his students were not familiar with the exercises (Case 2, Class Ob1, p. 2 L. 2-7).

In light of the above, however, teacher Shadi as a traditional case in this study, suffered a lack of two main elements mentioned earlier which were university preparation and in-service training. He emphasises that he confessed that he somewhat lacked awareness of the importance and usefulness of developing his students’ thinking skills through the textbook exercises. Also, he had not made use of them significantly before the researcher’s presence in his classroom when he noticed that I was interested in the textbook exercises:

‘To be honest, after your presence here in classroom I noticed that you are interested in these exercises; then, after looking into it deeply, explicitly, I find that it has questions which you can say appreciates the heart of the matter, and these exercises help to consolidate the information. In fact, I started dealing with it even in the sixth year... I did not realise it; sometimes one is unaware of something which he does not appreciate the value of. Then, if he tries doing it that he wonders: “Where are we from these exercises? We have wasted a lot of time!” This means that I do not know the significance of the exercise; and I haven’t got awareness of it. ... I tell you that in the past I did not care about the exercises, I was just thinking about the memory questions, but when I saw you looking and focusing on it and saw how the students were dealing with it, I sat pondering and explored it with the students. Then I felt that it would have helped to study and understand it, it is really beautiful. ...’ (Case 2, Teach SH, int 1, p. 1 L.15 - p. 2 L.6)

To me this means that, teacher Shadi in a later part of the study showed awareness and understanding of the effects of thinking skills on his students’ academic achievement and quality of thinking. Therefore, as an example of a teacher in the current study, he needs more professional in-service training aimed at promoting his level of teaching thinking skills effectively.

‘I do not have great interest in thinking skills, but this does not mean that the subject is not important, but there is no culture of this subject. I could be interested in a way that I do not feel it. ... I want my students to benefit from me in any way in the lesson ... The basis of a message that I will perform
As a consequence, teacher Shadi felt that he needed more training/development in order to be more confident/professional when dealing with thinking skills in the classroom.

As previously indicated in case 3, there was a clear impact of internal factors on teachers when dealing with thinking skills. One of the more obvious was the effect of the teachers’ Islamic views on the way of developing thinking skills in their students. This important element was discussed earlier, in the “Factors” section in Chapter Five.

As previously indicated in the “Factors” section in Chapter Five, a friendly relationship has effects on both students and teacher, and may have effects on the quality of teaching and the teacher’s output. However, during lesson observations I noticed that, in case 2 where the relations between students and teacher were formal, there was less interaction and question asking by the students. In this regard, case 2 teacher believed that he was not responsible for any student who had suffered from any weaknesses in the classroom.

In case 2 there were a number of difficulties that faced both the teacher and students. For the teacher, the two main challenges were a lack of time and the pressure of the daily timetable, while, for the student, the biggest difficulties that faced them were the teacher power relations, weak literacy and textbook challenges. These were discussed earlier, in the “Challenges” section in Chapter Five.

6.4. Chapter summary

This chapter presented a brief description of each case class in the study. Also, it showed two key patterns of applying thinking skills in the classroom: traditional and progressive. In addition, the data analysis showed a number of important characteristics that reside in the classroom and which are essential in the process of teaching and learning thinking skills, obtained from the experiences of both teacher and students. In the following chapter, a summary of the main findings of this study will be presented.
Chapter Seven

Summary of the findings
7.1 Introduction

This chapter considers a summary of the most significant findings giving insight into the research questions with reference to the existing literature.

7.2 Summary of the main findings

The previous two chapters offered the major findings of this study, first in full and then giving insight into contrasting cases. In this chapter, a summary of the main findings is now presented, by each research question, with reference to the existing literature, acknowledging the different natures of the studies in that they relate to different societies and cultural backgrounds. The research question one is addressed first within the five main emergent themes presented: teachers’ and students’ views of thinking skills, teachers’ preparedness, strategies and techniques for teaching thinking skills, students’ application of the thinking skills process and the textbook exercises as an infusion approach. Research question two is addressed next within the two main emergent themes presented: the perception of internal factors and the perception of external factors. Finally, research question three is addressed within the three main emergent themes presented: this theme identifies three main themes: teachers’ challenges, students’ challenges and textbook challenges.

7.2.1 Insight into the research question one:

To confirm, the research question one under investigation in this study is as follows:

**RQ1: What are the experiences of male teachers and 10-12 year-old students of teaching and learning thinking skills in the KSA primary curriculum?**

The data analysis generated rich patterns regarding teachers’ and students’ experiences of teaching and learning thinking skills in the classroom. Analysis of the cases’ data, as indicated in Chapters 5 and 6, showed five major themes:
7.2.1.1 Teachers’ and students’ views of thinking skills

Analysis of the lesson observations and interviews reveal that nearly all the teachers and students enjoyed teaching and learning thinking skills through use of the school textbook exercises, and they showed awareness of the importance of thinking skills in different school subjects in that they believed that the inclusion of thinking skills in the school curriculum is an essential part of the education process. The teachers’ and students’ positive feelings towards thinking skills are also significant as indicating a positive attitude to the future of education, in that they regard thinking skills as amenable to instruction.

The data highlighted that teachers felt that the principle of infusion was key in applying the teaching of thinking across the curriculum. Application of the infusion approach is an important element in classroom performance, as will be further discussed in Section: 7.2.1.5 Themes 5. This finding is in agreement with the findings of Al-Qahtani (1995) in which he concluded that all teachers in his sample in the KSA context were aware of the significance of teaching thinking skills in their classrooms, although they were unaware of what that teaching involved.

7.2.1.2 Teachers’ preparedness

The analysis of teachers’ interviews indicates teachers’ university was in general perceived by them to be inadequate preparedness for teaching thinking skills. There was a lack of knowledge of thinking skills and some had only been taught traditional theory. This lack of a clear knowledge of dealing with thinking skills affected teachers’ implementation of thinking skills in the classroom. Case 2 in particular, highlighted the problems of inadequate teachers’ preparedness and the gap between theory and practice in university preparation. The findings of this study agree with those of Mansour (2008a), who found that the effect of the gap between theory (through in-service and pre-service programmes) and practice had a strong negative influence on teacher education in Egypt, where these programmes were taught in a highly theoretical way.

Continuing professional development (CPD) or in-service training was the most-mentioned single element in developing teachers’ knowledge of teaching thinking skills in light of the inadequacy of their university preparation. Teachers who had experienced CPD felt it was invaluable in
filling the gaps from their university preparedness and that this was reflected in their classroom performance. They argued that CPD contributed to increasing opportunities for growth of teachers' skills and in their ability to develop thinking skills in the classroom. Conversely, teachers who had not taken any courses regarding thinking skills taught their lessons in a more traditional manner.

This finding concurs with Rodrigues (2005) who concluded that adequate and continuous training of teachers is a vital and essential element for improved teacher performance and attitudes toward teaching thinking skills in both England and Portugal, as change was mostly prompted by training. Furthermore, this finding concurs with that of Jones (2008) who found that there was an interesting correlation between the length of training received and the use of thinking strategies in England. Training in Thinking for Learning had a strong impact on teachers’ practice, in that 46% of respondents reported a great influence on their classroom practice as a result of this training (Jones, 2008). In addition, Barak and Shakhman (2008 a) concluded their research in Israel by stating that substantial work was required for teachers’ pre-service and in-service training programmes within the present educational system if they were to enable teachers to develop higher-order thinking as a regular feature in the classroom.

Rodrigues (2005): adequate training and the acquisition of practical and useful strategies to deliver thinking skills interventions in the classroom are paramount parameters that can further foment teachers' understanding and professional development. It is imperative that teachers continuously endeavour to perfect their teaching skills, so that teaching and learning become a permanent successful experience.

**7.2.1.3 Strategies and techniques for teaching thinking skills**

The study has argued that there is not one particular strategy that is appropriate all the time for all types of thinking skills. Despite the fact that there was a spectrum of approaches to teaching thinking as indicated in the last chapters, the majority of the case teachers consistently and continuously applied a range of mediational pedagogic strategies and techniques for teaching thinking skills throughout their lessons. These were: collaborative learning, dialogue, higher-level questions, scaffolding, cueing, giving enough time, the use of the language of thinking, feedback, and other individual techniques.
7.2.1.3.1 Collaborative learning

The majority of teachers used collaborative learning in teaching viewing this as a more helpful and effective means of developing students’ thinking skills, yet ensuring balance between individual learning and collaborative work. Reflecting teachers’ views and practices, the majority of the students (all of whom had experienced both individualized and collaborative approaches) reported interactive collaborative learning as the best way to develop thinking skills. The analysis revealed that some students believed that collaborative learning supported and encouraged their thinking skills, developed a way to extract ideas and benefit from each other and, because it allowed a greater response, was more motivating and more active and vital in allowing students to be more dynamic and facilitates collect their ideas together throughout the thinking skills process in comparison to traditional (individualised) methods.

This finding of the study is in agreement with the findings of many studies (e.g. Denis and Hubert, 2001; Rodrigues, 2005; Larkin, 2006; Schraw et al, 2006; Burke, 2007; Wix and Steiner 2008) to the effect that collaborative learning is one of the most effective strategies for teaching thinking skills. For example, the finding of the current study is in agreement with the finding of the Scottish study by Burke and Williams (2008) to the effect that collaborative learning is one of three intervention conditions to learning thinking skills in that it offers the opportunity for study and facilitates the path to learning. Furthermore, this finding concurs with that of Adey et al (2007) whose action plan for raising general cognitive ability emphasised that learning thinking skills should be collaborative, as this helps students learn to justify their arguments, listen to one another, and become more willing to change their opinions. Moreover, McGregor (2003, cited in McGregor, 2007) found from a survey of approximately 900 students that mediating by working together in small groups encouraged development of a variety of thinking skills, such as comparative thinking, analytical thinking, reasoned solutions, rationalization and many other cognitive functions, also assisting in collective decision-making skills.

7.2.1.3.2 Dialogue strategies

Six out of seven teachers and nine out of 24 students highlighted the strategy of dialogue as one of the most essential dynamic pedagogic methods for the development of thinking skills whether between teacher and student, student
and student, or teacher and group because dialogue assists students to be open-minded. This finding concurs with those of Wix and Steiner (2008), who concluded that dialogical peer inquiry strategies contribute to students’ development of perspectives which support them in taking the risk of discovery and in sharing ways of thinking. In the same vein, in a U.K. based study, Barrow (2010) found that dialogue strategies contributed exciting possibilities to provide a way beyond the improvement of students’ learning experiences. In the same context, one of the key findings of the study of Taggart et al (2005) regarding thinking skills in the early years was the significance of creating opportunities for dialogue. They stressed that, in both the infused and discrete approaches, dialogue can play a central role in the process of developing young children’s thinking skills.

7.2.1.3.3 Higher-level questioning strategies

Higher-level or ‘thoughtful questioning’, “a questioning that stimulates or encourages student thinking beyond the level of recall or translation” (Beyer, 1997: 30), was shown to be important in encouraging the growth and development of thinking skills (see Chapter Five, Section: 5.2.3.3; Chapter Six, Section: 6.3.1.1). One of the teachers explained that the reason for using higher-level questions was because he was aiming to stimulate students’ minds and raise their thinking, as well as helping stimulate students’ thinking skills through such techniques as comparing and contrasting, and critical thinking, and so saw himself as equipping students with new methods of finding and developing information through higher-level questions. Some students, whom I noticed always asked intelligent questions and made good assumptions (see Chapter Five, Section: 5.2.3.3; Chapter Six, Section: 6.3.1.1), emphasized that the teacher’s method of explaining the subject by applying higher-order questioning strategies had a great influence on them in terms of their ability to utilize clear thinking skills, and they thought their questions were influenced closely by this strategy. This finding concurs with Beyer (1997) who argued that asking higher-level questions improves the quality of students’ thinking through repeated opportunities to engage in the classroom context. Taggart et al (2005), also, concluded that questioning plays a central part in developing young children’s thinking skills.

McGuinness (1999) argued, classrooms which are characterised by talk and discussion and by questions and questioning need to be managed and orchestrated yet remain clearly focused on learning objectives. Teachers’ existing craft knowledge can be threatened as they struggle to implement this more constructivist environment.
7.2.1.3.4 Scaffolding strategies

Using scaffolding as one of the strategies for teaching and learning thinking skills supported students’ focus on their task which they were not able to do alone, and thereby helped them develop their understanding and thinking skills (see Chapter Five, Section: 5.2.3.4; Chapter Six, Section: 6.3.1.1). This finding corroborates that of many other researchers (e.g. Rosenshine and Meister, 1992; Beyer, 1997, 2008b; Hartnett, 2008) who argued that scaffolding is an influential strategy for developing learners’ cognitive skills and can be applied as structured support in a range of contexts.

7.2.1.3.5 Cueing strategies

Cueing strategies were used when students were finding difficulty in dealing with thinking skills, whether when they were not able to answer the question because they did not understand exactly what they should do or how they should do it, or, in the textbook exercises, by giving a key word or clue to the answer. In light of that, cueing strategies allow students to generate new information out of previously known examples relevant to the lesson topic. This finding of the study also corroborates Beyer’s argument (1997, 2008b) that cueing is a helpful strategy for improving learners’ thinking skills, because it supports and guides students’ application of almost any thinking process.

7.2.1.3.6 Giving enough time

Time was a key element in teaching and learning thinking skills. The analysis indicated that giving students enough time was reflected in the better development of thinking skills. In five out of seven cases, the teacher showed awareness of the significance of giving enough time to students when dealing with thinking skills in the textbook exercises. The findings of the current study are in agreement with the findings of many researchers (e.g. Cotton, 1991; Beyer, 1997; McGuinness, 1999), that giving learners enough time to think is one of the most crucial because it allows them to reflect on their thinking strategies and thus gain more self-control.

Indeed, other studies have concluded that time is a major barrier to the educational change process, which evolves around teacher training and
school change efforts (Little, 1992; Collinson and Cook, 2001; Rodrigues, 2005).

7.2.1.3.7 The use of the language of thinking in the classroom

Vocabulary and terminology (the language of thinking) indicate the elements of the thinking processes in the textbook exercises, such as ‘alternatives’, ‘critical’ or ‘summarise’ were beneficial in helping students to understand their own thinking and that of others as well as assisting students facing linguistic challenges when they were learning thinking skills. Taggart et al (2005) made a similar finding which brought to light the significance of children acquiring the specific vocabulary for communication with others regarding their thoughts. In addition, according to Beyer (1997, 2008b), the language of thinking helps students develop the quality and level of their thinking.

7.2.1.3.8 Feedback strategies

Feedback techniques engaged students over the key points of the cognitive processes that had been carried out, in order that the students were able to understand the exercises or higher-level questions, and which the students could then use in their thinking skills processes. The findings of the current study are in agreement with the findings of many researchers (e.g. Wegerif, 2002; Beyer, 1997, 2008b; Dewey and Bento, 2009), that giving learners evaluative feedback helps to enable them to take decisions through the activity and to enable them to think in a more structured way.

7.2.1.3.9 Individual techniques

Tables of self-assessment, concept maps, drawing, students as peer teachers, and step-by-step techniques were examples of techniques adopted by individual teachers. Such individual techniques played a great role in developing student thinking skills whether directly from the textbook exercises, or as part of a ‘strategy for thought’ taken from the textbook or invented by the teacher.
7.2.1.4 Students’ application of thinking skills

Findings from lesson observations and interviews indicate the majority of teachers addressed the development of different levels of thinking skills by using a wide range of such skills throughout the lessons, whether these were built into the textbook exercises or invented by the teacher himself. The following range of thinking skills was consistently and continuously applied throughout the lesson: critical thinking, creative thinking, problem solving, brainstorming, linking, comparing, summarising, justifying, imagining, decision-making, classifying, identifying assumptions, and thinking upside-down. In a U.K. based study by Dewey and Bento (2009), a similar finding was made where, following intervention, students were able to identify the wide range of thinking skills they had learnt throughout the year.

7.2.1.5 The textbook exercises as an infusion approach

Both science and Islamic education textbooks have adopted an infusion approach, (see Chapter Five, Section: 5.2.5), i.e. nearly all teachers believed that the infusion approach adopted by textbook exercises has an influence in that it encourages the development of students’ thinking skills in context. Application of the infusion approach is an important element in classroom performance in that it encourages the teacher to move away from traditional methods towards a strategy that assists the development of students’ thinking skills. For example:

Teacher (R): Before the current curricular development… the process of thinking was limited. Also, the usual method was to lecture. But the current curriculum has helped me to develop students’ capacities and skills, because that the current curriculum contains a wider range of thinking skills. (Case 4, Teach R, int 1, p.5 L. 26- 31)

With regard to students, all students reported that they enjoyed the thinking skills exercises, except for one student who said that: 'the activity is a difficult thing’. Students also believed that the infusion approach played a key role in developing their thinking skills. However, findings emerging from the classroom observations indicated that there were disadvantages of applying the infusion approach in that some teachers and students experienced tension between the textbook’s academic content and the teaching of thinking skills, particularly if a lesson’s topic was difficult. This finding is in agreement with the findings of many studies (e.g. Venville et al, 2003; Burke and Williams, 2008; Dewey and Bento, 2009; Aizikovitsh and Ami, 2010) to the effect that
embracing the infusion approach is one of the most effective approaches to increasing students’ thinking skills, as will be discussed in more detail later in Chapter Eight.

7.2.2 Insight into the questions two:

RQ2: What factors appear to guide teachers’ and students’ experiences of thinking skills?

The analysis revealed a wide range of influences on teachers’ and students’ experiences of teaching and learning thinking skills in the KSA context. The coding distinguished between two types of influences: internal and external:

7.2.2.1 Influence type 1: personal or 'internal' influences

The findings showed that personal or ‘internal’ influences were very important for teachers. The relationship between thinking skills and beliefs (religion) was the most influential element of teachers' internal influences; nearly all teachers believed religion had a powerful influence on practices of thinking skills in the classroom. This occurred through (1) the Islamic view of thinking which clearly affected and motivated them when teaching thinking skills, (2) the effects of the holy text encouraging being a thinker; (3) the influence of the biography of the Prophet Muhammad (peace be upon him) regarding the development of thinking; (4) Islam’s’ view of asking remuneration ‘Wages’ from Allah "God", meaning that religion has an impact on teachers looking for rewards from Allah rather than worldly rewards. Furthermore, teachers’ positive views of their students, believing that every student is able to develop their thinking skills, also had a great influence on both teachers and students in the thinking skills process. This finding is in accord with the findings of many studies (e.g. Pajares, 1992; Schraw et al, 2006; Barak and Shakhman, 2008 a, b; Mansour, 2008a, 2010) which concluded that teachers’ beliefs reflect on their own performance and are an important element in their professional development.

In addition, motivation was other major internal or personal factor in the teachers' perspectives and students’. There were many sources of motivation for both teachers and students. Teaching and learning of thinking skills seemed to be a dynamic process between the teachers and students in that
when the teacher saw the students developing and benefiting from learning thinking skills, it encouraged him to further present lessons in a lively manner and to encourage the development of his students’ thinking skills. This finding also corroborates Day et al’s study (2006) in which they mentioned that motivation is one of the key influencing factors on teachers’ sense of motivation which can influence their practice either positively or negatively. In addition, this finding concurs with Jones’s study (2008) which concluded that teachers’ motivation had a range of positive effects on their pupils, including pupil motivation. Rodrigues (2005) made a similar finding, that pupils’ progress was one of the main sources of change and motivation to teachers when teaching thinking skills.

7.2.2.2 Influence type 2: external influences

The findings obtained from the teachers’ and students’ interviews and classroom observations and group discussions revealed external influences, i.e. institutional and wider aspects which had a significant influence on the preparation of thinking skills in the classroom.

7.2.2.2.1 Social and cultural context

The surrounding social environment, particularly family background and local community culture, significantly affected the development of thinking skills. This environment exerted either a negative or a positive influence on teachers and students in that it may or may not be supportive of the development of thinking skills. In addition, one of the findings from the classroom observations was that a dimension of the wider socio-cultural context was evident in encouraging students to apply their thinking skills within textbook exercises through examples reflecting the reality of social life. This finding concurs with Jones (2008) which concluded that social factors could have a range of positive effects on pupils, including empathy and interaction aspects via communication.

7.2.2.2.2 A safe classroom environment

The results illustrate that both teachers and students emphasized a safe environment in the classroom as one of the most prominent elements
allowing for the development of students’ thinking skills. Most of the teachers showed awareness of the importance of ensuring a suitable classroom climate, as one of the teachers believed that achieving safety in the classroom was the ‘number one’ condition for the development of thinking skills. There were matches between some teachers’ and students’ views of the characteristics of the ideal safe environment in terms of giving students freedom to talk and ask questions and to apply equality between students for building and development of thinking in the classroom. The safe environment gained importance in light of the existence of power relations in some of the classrooms; power relations will be discussed more fully in the next chapter in Section 8.2.2. Many other studies (e.g. Adey et al, 2007; Beyer, 2008b; Utito and Syrjala, 2008; Owu-Ewie, 2008) have reached a similar conclusion that it is important to make classrooms personally safe, where it is natural to engage with others, and where students feel comfortable about opening their minds without feeling concern about others’ reactions and the possibility of being ‘wrong’.

7.2.2.2.3 Extra-curricular programmes

A convergence emerged from the three research methods that participation in extra-curricular programmes had a great influence both on students’ dispositions (such as positive attitudes) and their learning of thinking skills in the classroom. Such participation contributed to the improvement of thinking skills through classroom lessons, and to raising academic achievement by improving understanding of the textbook exercises and generally enhancing intellectual aptitude. One of the main reasons behind this view is that the students felt freer when doing thinking skills exercises among the different activities of the extra-curricular program compared to when engaged with the formal curriculum and were able to understand and use the language of thinking when undertaking the exercises. Also, extra-curricular programmes allowed those students involved in them to apply strategies and knowledge from the extra-curricular program to the textbook exercises. Eccles et al (2003), who reviewed a number of different studies which presented converging evidence that involvement in extra-curricular programmes, even non-academic ones, had positive effects on children’s development and facilitated academic achievement, would agree with this. Furthermore, this finding is in line with the findings of Fujita (2005) which emphasised that students’ participation in extra-curricular activities has a positive influence on academic performance.
7.2.2.2.4 Teacher roles

Findings from lesson observations and interviews indicate that teachers play a crucial role in promoting or hindering development of various thinking skills in the classroom. Also, it was found that there were two types of teacher role: progressive and traditional (see Chapter Six, Section: 6.3.1.1; 6.3.2.1). The progressive teacher role is the cornerstone in the thinking skills process because he establishes the best opportunity for promoting students’ thinking skills. This finding is in agreement with many researchers’ comments (e.g. Beyer, 1997; McGuinness, 1999; Al-bakr, 2004; Taggart et al, 2005; Barak and Shakhman, 2008 a; Owu-Ewie, 2008) on the significance of the teacher’s role in supporting the successful implementation of thinking skills in the classroom through prompting students’ curiosity, applying a wide range of strategies for teaching thinking skills, and creating an appropriate classroom environment. As can be seen, some of these strategies clearly promote thinking skills. Teachers should be conscious of these processes because they may produce some new understandings when they teach. Similarly, students need clear guidance when learning complex processes.

7.2.2.2.5 The relationship between teachers and students

A friendly relationship had an effects on the student by instituting a positive atmosphere for promoting their thinking skills. A good relationship between teachers and students offers easy communication between teacher and students, whereby students have more respect and pay greater attention to thinking skills operations. The relationship between teachers and students will be discussed more fully in the next chapter in Section 8.2.2. The finding of this part of the study corroborates previous research on the role of a friendly relationship (e.g. Eteläpelto and Lahti, 2008; Uitto and Syrjala, 2008; Burnard and Swann, 2010), in that a friendly relationship with pupils inspires learning.

7.2.2.2.6 The appropriate classroom

The analysis revealed a range of physical and emotional factors of appropriate classrooms which affect teaching and learning thinking skills. Such factors can make education enjoyable and encourage and prepare the student to receive the information and develop his skills within the lesson. If the student feels
relaxed and comfortable when learning, then the classroom is likely to have an appropriate emotional climate. Furthermore, a suitable physical environment, including comfortable chairs, clean surroundings and a fresh smell, was an important element in setting the scene for learning thinking skills in the classroom. Owu-Ewie (2008), also, found that both the intellectual and physical classroom environments could have the effect of promoting or of inhibiting the development of thinking skills. Also, this finding also is in agreement with the findings of Al-sughayer (2007) in which the effect of a suitable physical environment was one of the most serious hindrances to the development of critical thinking skills in the KSA context, particularly as some the KSA classrooms suffer from a lack of necessary material resources such as effective libraries, computers rooms and laboratories.

7.2.3 Insight into the research question three:

RQ3: What are the main perceived challenges facing teachers and students when they are teaching/learning thinking skills?

Findings which emerged from the teachers' and students' interviews and classroom observations and group discussions showed that eight main challenges faced teachers and students in the classroom when they were teaching or learning thinking skills. The challenges divided into those experienced by teachers, those experienced by students and those associated with the textbook.

7.2.3.1 Teachers' challenges

There were three main challenges experienced by teachers, as follows.

7.2.3.1.1 A lack of time

The findings indicated that one of the commonest challenges to the majority of teachers was a lack of time. Two teachers emphasized that they were trying to tackle thinking skills through inclusion within the school curriculum but
they could not because of the pressure of time. On the other hand, two teachers who had received training regarding thinking skills believed the development of thinking skills did not require any extra time to teach. Classroom observations revealed the lack of time had a negative impact on the thinking skills process, giving students inadequate time to think and causing them to miss out some exercises. One of the main causes of lack of time that emerged through the teachers’ interviews and classroom observations was the continuous assessment system (CAS). The CAS is a short exam requiring that the teacher almost daily asks all the students about pre-defined points. Another cause of lack of time was found to be the number of students in the class, while a further source was found the intensity of the academic content in the textbook and its pressure on the teacher, particularly as the curriculum must be covered within the academic year.

This finding is in agreement with the findings of Al-Qahtani (1995) in which the effect of a perceived lack of time by teachers was one of the most serious hindrances to the teaching of thinking skills, particularly in the already overburdened KSA syllabus. In addition, this finding concurs with Jones (2008) who emphasised that a lack of time, whether in the timetable or for planning and/or developing resources in the English context, was reported to be a major challenge by most respondents, in light of the inherent difficulties in the teaching of thinking.

7.2.3.1.2 A lack of professional training

“Teachers need training courses in order to learn how to deal with the development of thinking skills in students, because few teachers know the skills of thinking …” (Case 6. Teach F, int 2. p.1 L. 21-23). However, findings emerged from the teachers' interviews and classroom observations, which showed features of the teachers’ lack of experience when dealing with thinking skills. Teachers' interview findings indicated that some teachers were unwilling to participate in the in-service training courses because they perceived a lack of professionalism in such courses, particularly those provided by the Local Department of the Ministry of Education. Consequently, some teachers sensed that they would derive little benefit from the training courses. In addition, school timetable demands made it difficult to find a good time for training. Similarly, Rodrigues (2005) found that limitations in the quality and quantity of training courses affected the implementation of the infusion approach in the classroom.
7.2.3.1.3 Swimming against the stream

The findings obtained from teachers' interviews revealed that the major challenge identified by some teachers was teachers’ feelings of frustration which reflected negatively on the thinking skills process. Various teachers reported feelings of frustration with a variety of sources. Some teachers felt that they were working alone in their school environment, where they felt like a person ‘swimming against the stream’ (Case 7, Teach N, int 4, p. 4 L. 27) as far as teaching thinking skills was concerned. A lack of encouragement from the Ministry of Education, which provided no incentive system for the teacher who worked hard to develop his students’ thinking skills, who therefore did not receive greater rewards than the teacher who adhered to traditional methods, was felt to be de-motivating. The findings of the current study reflect the findings of other researchers (e.g. Cotton, 1991; Jerwan, 1999) who concluded that administrative support and school commitment are essential for the achievement of thinking skills instruction in the classroom.

7.2.3.2 Students' challenges

There were four main challenges experienced by students, as follows.

7.2.3.2.1 Weak student literacy

The findings indicated that one of the key student challenges which led to constraints in students’ interactions and attitudes toward learning thinking skills in the classroom was their weakness in literacy. Lesson observation findings indicated that weakness in literacy was a key factor restraining the development of the thinking skills of certain students; such a student focused on the linguistic correctness of his work rather than on the interaction to develop his thinking skills. The student concentrated on looking at what his classmate had written and copying it rather than on developing his thinking skills via interaction with the textbook exercise. As mentioned previously, there are a lack of studies about students’ learning of thinking skills in the KSA context; therefore weak student literacy and the language of thinking are gaps which require further research.
7.2.3.2.2 Power relations

Power relations, whether coming from the teacher's authority or between members of the group, resulted in the lack of a safe classroom environment. Where the student was in fear of rejection from other students, or felt a lack of trust or inequality, these feelings had a negative effect which restricted the development of thinking skills in the classroom. Some students were afraid that the teacher would have a negative perception of their academic level. Power relations thus seemed to be a challenge for creating the best opportunity for enhancing students' thinking skills in the classroom. This is in line with the findings of many studies on the role of power relations between elements of a group within a context of collaboration (e.g. Littleton and Miell, 2004; Eteläpelto and Lahti, 2008). They concluded that power relations within the community were the most significant challenges for creative collaboration where there could be tensions between group members.

7.2.3.2.3 Student perceptions of the teacher as potentially one of the challenges

Building on the point above but narrowing specifically to the reader, a finding which emerged from student interviews, lesson observations and group discussions was that that the teacher himself could be the main challenge when students were learning thinking skills. He might use traditional methods, be irritable, and assert his power in the classroom. Through analysis of the student interviews, about half emphasized that the teacher was one of the challenges facing them when they were learning thinking skills. For example: (1) some teachers did not leave room for questions or for dialogue with the students; (2) some teachers did not offer a conducive atmosphere for students to offer their thoughts; (3) some teachers seemed to be challenged by their lack of experience in dealing with thinking skills. Teacher dispositions were, similarly, found by Jones (2008) to be one of five main challenges related to teaching thinking skills, in that it may be difficult to adapt lessons to incorporate thinking strategies, especially in light of the diversity of students.

7.2.3.2.4 A lack of time

The findings indicated that, as with teachers, a lack of time was mentioned as one of the commonest challenges to the majority of students. One of the main
aspects of a lack of time regarding students was when the teacher only allowed a short time to deal with the exercises. There were further negative aspects as constraints on the quality of the thinking skills process, such as some students feeling there was pressure and a feeling of conflict when dealing with thinking skills through textbook exercises. Therefore, the students’ benefit from the exercises could be limited. According to my knowledge, there are no studies about the effective time for students in the KSA context; this is also one of the gaps in the area of teaching and learning thinking skills in the KSA context which needs to be further explored.

7.2.3.3 Textbook Challenges

The textbook exercises include a number of thinking skills. However, the findings revealed that one of the main sets of challenges concerned some of the textbook exercises. Some questions included vocabulary and terminology that was difficult to understand. In addition, some exercises involved in-depth questions that required advanced planning by the teacher, and some teachers found this difficult. As previously mentioned, the infusion approach was only recently introduced (in 2007). Therefore, according to my knowledge, there are no studies about applying the infusion approach in the KSA context. This is also one of the gaps in the area of teaching and learning thinking skills in the KSA context which needs to be explored further.

7.3 Chapter summary

This chapter focused, firstly, on presenting a summary of the most significant findings aimed at answering the research questions with reference to the existing literature. The next chapters will address the main overarching thematic findings that emerged from the qualitative data analysis in relation to the existing literature.
Chapter Eight

Discussion of the main findings
8.1 Introduction

This chapter addresses the main thematic findings that emerged from the qualitative data analysis in relation to the existing literature. The discussion takes into account the research questions and allows insight into the findings from the semi-structured interviews, classroom observations and group discussions.

8.2 The overarching thematic finding of the study

Synthesising the answers to the research questions, analysis revealed four overarching thematic findings related to the experience of teaching thinking skills in the KSA context which have not been mentioned before which are of particular significance to teaching and learning thinking skills in the KSA context. These overarching thematic topics are now discussed here with reference to a wider literature and can be summarised as follows:

- Overarching theme one: Teachers embracing the infusion approach to thinking skills via textbooks;
- Overarching theme two: Teachers’ and students’ complementary roles;
- Overarching theme three: Spiritual/cultural inner motivation;
- Overarching theme four: The effects of teachers’ and students’ identities on teachers’ and students’ performance of thinking skills.

8.2.1 Overarching theme one: Teachers embracing the infusion approach to thinking skills via textbooks

The findings indicate that teaching and learning thinking skills was a natural part of the subject matter in curricular areas which were applied through the infusion approach. All teachers in this study insisted on the powerful effect of the infusion approach in the textbook as a source of thinking skills on both teachers and students because they believed that it encouraged the creation of the best opportunity for promoting students’ thinking skills (see Chapter Five, section: 5.2.5). These findings concur with other studies (e.g. Venville et al, 2003; Burke and Williams, 2008; Dewey and Bento, 2009; Aizikovitsh and Ami, 2010) which argued that the infusion approach increased students’ thinking skills. In addition, participants in the current study emphasised that
the infusion approach, encourages the teacher to move away from traditional methods towards techniques that help develop students’ thinking skills.

The study revealed that various kinds of thinking skills were suitable for both the science and the Islamic curricula, whilst others were more suitable for some subjects than others. In this regard, the findings indicated that teaching and learning thinking skills through both science and Islamic education contributed towards the development of students’ thinking skills.

Cases 1 and 6 offered examples of embedding thinking skills through the science curriculum. Some of these thinking skills may be suitably shared between all areas of the curriculum, or particular kinds of thinking skills may more appropriate for science education. Scientific inquiry skills are examples of thinking skills that could be more developed within the science curriculum. This finding is parallel to that of previous studies (e.g. Zimmerman, 2007; Simuček and Kabap꾼ar, 2010) which concluded that using skills of scientific procedure such as designing experiments, assessing and/or revising evidence and creating inferences from the phenomenon under examination enhanced students’ understanding of science concepts.

Cases 3, 4 and 7 offered examples of embedding thinking skills through the Islamic education curriculum. Some of these thinking skills may be common to all areas of the curriculum, while others may be more suitable for Islamic education. Inferring and reasoning skills are examples of thinking skills that may be more developed within Islamic education. Reviewing evidence and drawing inferences to try to understand and interpret causal relationships would help to support reasoning about the phenomenon under study.

Another example of a thinking skill that is of crucial importance and which may be enhanced within both the science and Islamic education curricula is critical thinking. This finding of the study corroborates other studies (e.g. Malamitsa et al, 2009; Barak and Dori, 2009; Qing et al, 2010 a; Qing et al, 2010 b; AktamὍύ and Yenice’, 2010) which concluded that science education may be more successful where students have developed critical thinking skills and, conversely, critical thinking skills may be enhanced through science education. Likewise the present study revealed how the Islamic education curriculum reasoning thinking is important in understanding the logical connections between ideas within Islam and to identify the relevance and meaning of rules in Islamic law. These findings of the study corroborate studies which concluded that teaching of Islamic education develops reasoning thinking to a high level because Islamic education is based on
the Qur’an and/or the Sunnah texts and involves enquiring into the validity of texts and of inferences drawn from them (Al-bakr, 2004).

This is not to deny the existence of scientific thinking in Islamic education or inference and reasoning skills in science education. On the contrary, a number of scholars argue that scientific thinking exists in Islamic education, for example, Al-Haidari (2003) identified seven types of scientific thinking in the sources of Islamic education. In the same respect, (Zimmerman, 2007) emphasised that reasoning skills exist in science education. As found in the present study, both science and Islamic education as subjects in primary curricula contributed to developing several thinking skills through the infusion approach (see Chapter Five, Section: 5.2.5). However, the study’s findings strongly support the idea of adopting the infusion approach only by subject matter in that printed materials (such as the textbook) themselves will not be sufficient to bring about a shift in beliefs about the nature of teaching and learning thinking (Adey, 2006 b).

The data provides evidence that interaction in the classroom, a main aspect of the sociocultural approach, played a key role for many students in developing their thinking skills. The role of the interactive relationship between teachers and students and/or among students has been one of the significant findings of the current study that has reflected positively or negatively on the thinking skills process in the classroom. Recognising the sociocultural framing of the classroom experience provides a depth of understanding of thinking skills processes in classroom contexts, and the following two themes will clarify and explain these dimensions.

8.2.2 Overarching theme two: The teacher’s and students’ complementary roles

The current study seeks to understand interactions within a socio-cultural context and how they affect thinking skills processes in classroom contexts. Therefore, it is important to recognize that understanding the processes of teaching and learning thinking skills, in large part, is a social construction process. In this regard, the findings of the current study indicate the sociocultural framing of the school organization have great influence and a powerful effects on the classroom context. Moreover, it revealed how the actual dynamics of interactions in classroom contexts was a very important part of the development of thinking skills. These interactions are immersed in
the school and can be categorized into the social contexts related to teachers and students living in society and cannot be separated from it. The sociocultural approach suggests that personal interaction cannot be separated from the larger mediation and interaction context that influences the development of the thinking skills process. Mediation is a dynamic phenomenon which assumes that human beings and the environment cannot be considered in isolation.

The study thus revealed that it is impossible to discuss the experience of teaching and learning thinking skills without talking about the effect of the social environment. The influence on thinking skills of the teacher and students interacting with each other, forming the context and relationships within the classroom, whether between teacher and student, student and student, or teacher and group, is powerful.

Mutual relationships within the classroom have been discussed as features of classroom interaction and embedded naturally within the teaching process and continually constructed in daily situations between teacher–students or student–student. The understanding of the nature of relationships between the teacher and students is important for this study in that it yields insights which can provide a new starting point for understanding how the teaching and learning of thinking skills operates. Relationships have already been mentioned where a majority of the teachers and students used the terms “relationships and power” when explaining their experience of learning thinking skills operations. An example of the use of the term ‘relationships’ is:

‘Student relationships are sometimes an obstacle to the development of thinking skills; often some students do not like the student who participates... the student does not work when he is inactive or repressed sometimes. And sometimes some students feel ashamed.’ (Case 1, Teach A, Int 1, p.11 L. 6-9)

An example of the use of the term ‘power’ is:

‘First feature of power: insulting the students in front of the teacher; second feature of power, ridicule. He ridicules any student making fun of him..., like you say... I feel frustrated... I cannot think...' (Case 3, St Mazide, Int 1, p.6 L. 5-15)

As discussed already, the potential of the concept “power” in teacher–students relationships began to emerge from the findings, since power seemed to be a component rooted in thinking skills practice by teachers and students. There were several reasons for this. Firstly, a safe classroom atmosphere was an essential element repeated regularly by students when
they mentioned their experience of their teachers. Thus, this illustrates how power can be understood as an indispensable element in teaching and learning thinking skills in the classroom. Secondly, the thinking process needs more freedom to think and say within a secure atmosphere than other learning processes; so a secure classroom atmosphere assists in developing these thinking skills. Thirdly, educators realise that an understanding of the reciprocal power relations in the classroom contributes to a better understanding of classroom practices (Cothran and Ennis, 1997). Consequently, the attempt to understand the term ‘power’ is significant in itself and obviously meaningful, in that the different understandings of ‘power’ can be viewed as indispensable elements in teaching and learning thinking skills in the classroom.

The teacher–student relationship always includes power. Power is a constant in teaching where context plays an essential role and every new learning situation entails a new relationship (Uitto and Syrjala, 2008). The view of power in the teacher/student relationship requires an understanding of the social context; it provides a framework within which to interpret the profession in its social context (Edwards, 2006). The concept ‘power’ is a depiction an imbalance of teacher–student relationships, whether coming from the teacher’s authority, or between teacher and students, or from power relations among elements of the student group which controls others’ actions. These require an understanding of the social context, and its direct or indirect influence on the development of thinking skills processes in the classroom.

The issue of relationships has been discussed by various scholars, such as Bourdieu (1986, 1992, 1993). He argues that relationships can help us to understand the social context within which we live. For Bourdieu, social fields involve several socially effective dimensions or resources. He uses the concept of ‘capital’ in describing dimensions of class: cultural capital, social capital, and economic capital. Social relations can be articulated by these types of capital which seem to act in the reproduction of social domination, used for the reproduction of inequality. Also, each individual occupies positions in social networks, which seems to be a formula legitimized by symbolic capital mediation. In addition, within the social capital concept, a practice occurs in a particular social relation that gives agency to those who invest in it by engagement in everyday practice and which develops some of their position. Ownership of this social capital produces and reproduces social domination which is used to obtain functions of power. A main advantage of Bourdieu’s ‘social fields’ theory is his stress on dynamic and relational features and the positions and explained relation of the actors to each other as explained by
amounts of capital (Ihlen, 2005). This applies also to the current study as will be discussed later in this chapter at Section 8.3.

In this regard, Ihlen (2005) argues that the concept of social capital helps to explain the resources of a community and the level of value which an individual’s networks share within it and which agents use to pursue their interests. Consequently, there are clearly risks, such as conflicts and the power function, involved in investment in social capital.

Social capital invested in social institutions could reinforce the symbolic capital constitution (Bourdieu, 1986). From this perspective, Edwards (2009) emphasised that symbolic capital becomes valued more than its material features imply, and when connected with a person has an influence on ‘whether they dominate or are dominated’. In this regard, Siisiäinen (2000) argues that Bourdieu’s idea of social capital becomes meaningful only by the process of symbolism, in that symbolic capital gives legitimation for the division of social resources. This is because symbolic capital identifies the forms of distinction used as bases for the legitimation of social positions in a particular community, resulting in symbolic power. Bourdieu’s concept of symbolic power is “generated by dominant groups misrepresenting their interests to the public, thereby normalizing social structures and habitus that support their position” (Edwards, 2006:230).

In Ihlen’s (2005) view, the spirit of public relationships seems to be social capital, and during it, symbolic capital. He argues that “relationships can be called the social capital of an organization, and that this concept has greater explanatory strength than relationship management because it engages more directly with issues of power” (P. 492). In this position, Ihlen argues that organizational power positions ‘must be understood’ through all different types of capital. On the other hand, practices within dominant organizations must be dynamic or will be overpowered by opposition (Roper, 2005).

In light of the aforementioned review, the finding of the current study regarding the process of classroom relationships revealed that the teacher and the students form an asymmetry in classroom relations. This was demonstrated by a comparison of the cases of the current study, in that those relationships could be divided into two fundamental and opposing types of classroom relationships. Both fundamental relationships involved actors acting towards each other, such as between teacher and students, as meaningful interaction within the organization, which here is ‘a classroom’. This finding concurs with other educational research (e.g. Noblit, 1993; Cothran and Ennis, 1997; Uitto and Syrjala, 2008) which distinguishes
between power that is used for the sake of hegemony - maintaining the interests of a particular group - and power that aims to serve people morally. Hegemony can be defined as “domination without physical coercion through the widespread acceptance of particular ideologies and consent to the practices associated with those ideologies” (Roper, 2005:70).

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Figure 8.1: Types of classroom relationships in each case

In two of the case study classes, thinking skills were being taught within the science curriculum, while in the other five case study classes, thinking skills were being taught within the Islamic education curriculum.

The first type of classroom relationship is the traditional one. Uitto and Syrjala (2008) use the metaphor of ‘non-encounters’ in describing this kind of traditional relationship. Case 2 offered an example of a traditional relationship, which involves conflicts of power practices in the process of engaging in the context of the classroom (see Chapter Six, Section 6.3.2.1). From this perspective, as described earlier, the position of power practices flows from the organization’s role in supporting the state, so the power in the class is held by the teacher. This may come from a view of the school as a community organization which contributes to the reproduction of power relations to create good citizens who do what the community wants, based on the school’s social legitimacy (Buzzelli and Johnston, 2001).

In the traditional classroom relationship, the students described how they faced power and hegemony whether it came from the teacher or among the students themselves. In this regard, Uitto and Syrjala (2008) argue that the teacher–students relationship is fundamentally asymmetric because it is a relationship between an adult and a child. Thus, within traditional relationships, where hegemony is established within social fields, it is maintained by struggles of power among the main actors of society (Roper, 2005). Use of power in these classroom relationships depends on the cultural expectations of the teacher, of what he should be doing according to different rules and regulations (Uitto and Syrjala, 2008). In classroom relationship terms, this point has been made clearly by Buzzelli and Johnston (2001), who
discuss the term ‘authority’ as involving both the teacher possessing authority and having the power to direct classroom activities. This power sometimes has the effect of weakening or disrupting the application of thinking skills within the classroom (see Chapter Six, Section: 6.3.2.1).

The traditional classroom relationship was revealed through some teachers’ behaviour or characteristics, such as, applying penalties, unfair treatment, uncaring treatment and a failure to see from the students’ point of view. It also appeared when students and teachers referred to conflict and tensions, related to differences between their values in that, in the traditional classroom, the teachers exert control over students in the learning process. This may be one of the reasons behind some teachers preferring to teach the textbook’s academic content rather than the textbook’s thinking skills exercises because the former is easier to control compared with the latter. This is in line with the findings of Al-Quhtani’s (1995) study that traditional teachers are most comfortable with being able to dominate their presentation by determining what, when, where, how and why a thinking skill process would be used.

The findings revealed consistency between traditional classroom relationships and teaching traditional practices, resulting in minimising opportunities for the development of thinking skills, and focussing on basic thinking skills. This occurred even when thinking skills were infused throughout the textbook, whether in the science case, such as in case 1, or in the Islamic education case, as in case 2 (see Chapter Six, Section: 6.3.2.1). This finding concurs with that of Al-Qahtani (1995) who concluded that traditional teaching practices in the KSA context, such as the passivity of the student’s role, the examination orientation of the programme lead to a focus on simple recall rather than on encouraging students to do integrative thinking. These traditional practices have resulted in minimum attention being paid to the teaching of basic thinking skills, for example summarizing or identifying main ideas, and even less to the teaching of higher order thinking skills.

A variety of causes contributed to the existence of traditional relationships in the classroom. One of the main causes that emerged through teachers’ interviews and classroom observations might be related to the fact that all teachers believed that their university preparedness had been inadequate, as well as there being a lack of formal in-service training courses (see Chapter Five, Section: 5.2.2, 5.4.1.2) . This view matches Kwo and Intrator’s (2004) view that teachers who conform with the dominant teaching culture hinder the learning of their students.
However, as Cothran and Ennis (1997) emphasised, having traditional classroom relationships does not mean that students do not have aspects of power. Nevertheless, the teachers have the formal power or authority in the class, leading to the teacher needing the students’ compliance. In this study, one of the teachers’ key frustrations is the low level of student compliance and their non-participation in class activities.

The traditional view of the teacher is as the main power holder in the classroom (Cothran and Ennis, 1997, Uitto and Syrjala, 2008); however, there are also other power holders in the classroom, power among students themselves or ‘personality power’. These power relations among students often appear within the group learning situation and take different aspects throughout thinking skills collaborative tasks, such as unequal power relations, ridicule and devaluation from a powerful student.

These embody the power scene in the classroom context as features of tensions and power within the group, and are particularly felt by students who themselves are powerless (see Chapter Five, Section: 5.4.2.2). This is in line with prior research on the role of power relations and emotional climates between elements of a group within a context of collaboration (e.g. Littleton and Miell, 2004; Eteläpelto and Lahti, 2008). They concluded that power relations and individual participants’ deep emotional participation within the community are the most important challenges for creative collaboration where there were significant tensions between group members.

From the students’ experience, these traditional classroom relationships were described (whether between teacher and student or among the students themselves) as an insurmountable obstacle and as one of the most influential factors when learning thinking skills, even in a progressive classroom (see Chapter Five, Section: 5.4.2.2). This finding concurs with that of Uitto and Syrjala, (2008) who characterised the students’ point of view of the relationship between teacher and student as one where the teacher is not interested in the students as individual human beings. This concept of teachers’ power may have some negative implications on thinking skills in the classroom.

‘Traditional’ cultural capitals of the classroom could contribute to the existence of a traditional relationship in the classroom which has effects on teaching and learning of thinking. The cultural capital concept encompasses schools’, teachers’, and students’ views and values and these influence their classroom interactions. Case 2 offered an example of ‘traditional’ cultural
capital in which the students had difficulty accessing thinking skills in the curriculum (see Chapter Six, Section 6.3.2.1).

The second type of classroom relationship revealed by this study is the progressive classroom relationship. Uitto and Syrjala (2008) use the metaphor of ‘encounters’ in describing progressive relations as a sense of humane service as an element of the teacher–student relationship. In this perspective, teacher and students are together constructing their mutual moral relationship. Teacher cases 3, 4, 5, and 7 offered notable examples of progressive classroom relationships, in that they believed that the relationship between teacher and students should be reciprocal.

In progressive teacher/student relationships, the teacher establishes a mutual relationship between himself and his students, characterised by closeness, intimacy, encouragement, safety, equality, caring for the students individually, learning and responding to the students’ needs and making students eager to learn. All of these are significant for thinking skills processes in that students not only did what the teacher told them to do but also constructed new ideas of their own (see Chapter Five, Section: 5.3.2.5). The findings of this part of the study corroborates previous research on the role of the classroom environment, which needs to be emotionally positive (e.g. Littleton and Miell, 2004; Eteläpelto and Lahti, 2008; Uitto and Syrjala, 2008) and caring for the students in body and spirit. Furthermore, Beyer (1997) calls these ‘thoughtful classrooms’ which provide a suitable learning environment for fostering, stimulating and protecting thinking. These classrooms, as Beyer emphasised, encourage student engagement in increasingly higher-order thinking rather than merely reproducing knowledge.

However, this does not mean that in the progressive relationship perspective there are not aspects of a power relationship or tensions, rather that the teacher invested this power as reciprocal power to develop students’ thinking skills. As many researchers (Buzzelli and Johnston, 2001; Eteläpelto and Lahti, 2008) have emphasised, tensions are always present in the learning relationship and cannot necessarily be resolved. The teacher–student relationship always includes power, which requires one to be present in time with one’s body and soul (Uitto and Syrjala, 2008). This finding of the study also corroborates Cothran and Ennis’s study (1997) in which both teachers and students recognise that they have sources of classroom power and that they use it to influence the class. In this connection, the findings of the current study revealed that students repeatedly talked of their experience about how
the progressive relationship really enables them to develop their thinking skills in class.

One of the essential findings regarding requirements for the thinking skills process which have to be in place for thinking skills to occur is security. Students must feel a sense of safety and trust in the group, which can function as a significant resource. A necessary condition is commitment to the group when students are thinking and learning (see Chapter Five, Section: 5.4.2.2). Provision of safety and trust in classroom contexts allows a progressive relationship to exist. This permits true sharing in learning and the development of thinking skills. This is in line with previous studies (Moran and John-Steiner, 2004; Searle, 2004; Eteläpelto and Lahti, 2008) which examined the role of safety and trust aspects for the development of thinking skills, finding that when students feel safe they will mutually assist each other.

These findings suggest that, with a progressive relationship, the teacher invests his meaningful power for developing his students’ skills through sharing power and responsibility with them. The basis of the teacher–student relationship is as ‘person to person’ (Uitto and Syrjala, 2008). In addition, the teacher has to have minimal authority and power in classroom (Cothran and Ennis, 1997). The progressive relationship leaves a mark on the student during the development of thinking skills which is then reflected in higher academic achievement.

A variety of reasons contributed to the existence of a progressive relationship in the classroom. One of the main factors that emerged related to the fact that all teachers who applied progressive relationships in their classrooms had undertaken in-service professional training courses and these contributed to establishing and refreshing this progressive educational perspective (see Chapter Five, Section: 5.2.2). This view matches with Cothran and Ennis’ (1997) and Kwo and Intrator’s (2004) views that every teacher should have continuous professional development which aims to enhance both the quality of the education system and the students’ learning. In my study, this training gave valuable input to change the power relationship between teachers and students from one of conflict to one of consent and mutual participation in an educational purpose.

The findings of the study showed that teachers’ professionalism plays an especially significant part in the progressive relationship perspective, and successful teaching and learning of thinking skills in the classroom hinges, in large part, on such a progressive relationship. However, as Kwo and Intrator
(2004: 282) emphasised, “how teachers react to the environment reveals the core of this learning that cannot be understood without addressing their inner lives”. This will be addressed in the next theme which is “spiritual/cultural inner motivation”.

Analysis of the data showed that teachers within the progressive classroom created and maintained progressive student-student relationships via their strategies for teaching thinking skills, for example, they were able to change student-student relationships to ones of consent rather than conflict. Also the teachers produced minimal conflict in student-student relationships through treating all students equally, not preferring one over the other. This is shown in an example from the classroom observations: The teacher showed his awareness of the importance of equality between students when managing the answering process and choosing who would answer. When he noticed a student who was not happy that he had not been chosen, the teacher justified why he allowed one student to answer rather than another (Case 3, Class Ob 3, p. 9 L. 43-47). (See Chapter Six, Section: 6.3.1.1). Also, creating progressive student-student relationships contributed to the development of students’ thinking skills by supporting them in sharing ways of thinking. This allowed them to improve their understanding of the textbook exercises and thereby to raise their academic achievement and generally enhance their intellectual aptitude. One of students presented this observation:

‘... [T]he communication between me and other students gets better and better. Also I understand my colleagues and the lesson in a larger way; ... encourages me to think. ...the answering of questions was approximately 90% ...’ (Case 6, St Trbag, int 1, p.3 L. 31 – 35)

Another significant reason that may have contributed to the existence of a progressive relationship in the classroom is the cultural capital of the classroom. Cultural capital within the progressive classroom has effects on the teaching and learning of thinking. This cultural capital consists of the cultural capital of the students, formed particularly in the home and from prior experiences; it also involves the school’s values, views and facilities such as extra-curricular programmes (See Chapter Five, Section 5.3.2.3). The cultural capital concept applies not just to students, but also to their parents and teachers, and to the school’s values and ways of knowing (Stewart, 2010). Case 3 offered an example of ‘progressive’ cultural capital of the classroom (see Chapter Six, Section 6.3.1.1).
Overarching theme three: Spiritual/cultural inner motivation

The term ‘spiritual/cultural inner motivation’ includes elements such as personal beliefs, personal views on thinking, life experience, background and human factors in the classroom. Each one of these elements is perceived to lead to a direct or indirect positive or negative attitude towards the thinking skills process. The findings of the analysis indicated that the teachers’ personal religious beliefs about the thinking process and its purpose within the context of Islam were a very important factor as a core of ‘spiritual/cultural inner motivation’ for all case teachers. This perspective permits a fundamental understanding of teaching and learning thinking skills in the KSA context. Moreover, teachers’ personal religious beliefs were rooted in the culture of the social context as one of the strongest influences on teachers’ identities. These beliefs related to the teachers as individuals living in a society in which they interacted on a daily basis and which was then reflected in their performance within the educational context.

The findings of the present study also indicate that teachers’ personal beliefs have a significant positive impact, particularly in the case of some progressive teachers. When they faced certain challenges in their schools which were steeped in a traditional mindset, they obtained great support from their belief in the Islamic view of asking for ‘wages’ from Allah "God". As one of the teachers described, if rewards from Allah did not exist ‘the candle of effort would be extinguished’ (Case 4, Teach R, Int1, p. 10 L. 10). In addition, teachers hold the Islamic perspective on the significance of thinking taken from several holy texts (the Qur’an and the Sunnah) which encourage Muslims to ijtihad, which means the realization of the mind through a number of higher analytical skills. The aim of ijtihad is to reach a particular result linked to Islamic legislation. These texts inspire and encourage the development of thinking skills and so exert a powerful influence on teachers’ views. In this respect, moreover, the biography of the prophet Mohammad (peace be upon him) regarding the development of thinking has a huge influence on teachers when teaching thinking skills (see Chapter Five, Section: 5.3.1.1).

The current study clearly shows that all the science and Islamic education teachers, both traditional and progressive, argued that Islam as their personal religious belief supported thinking. This understanding of the support for thinking in Islam is based on their belief that there is no contradiction between revelation in Islam and rational thinking. They did not sense any kind of contradiction in believing that deep thinking would guide to the truth.
of revelation, on the assumption that, if there was any conflict, revelation should take priority, emphasising that they believed that there was no contradiction.

In this study, the reason for teachers’ personal beliefs having such a significant positive impact could be that Islam has a wide influence on social and cultural life in the KSA because the country is rooted in the depths of Islamic history. Because the education system is a part of the socio-cultural context, it emphasizes the Islamic view at all levels of subject matter in the KSA education system. This cultural heritage has been highlighted as a powerful source providing moral guidance for teachers’ work in the classroom and thereby informing their actions.

The impact of religion is significant as spiritual/cultural inner motivation contributes to a deep understanding of the practices of teaching thinking skills, especially when teachers face the challenges in the traditional school and classroom contexts. This finding matches Kwo and Intrator’s (2004) who argued that improvement initiatives which fail to strengthen the inner power of teachers’ lives would be limited to superficial service and, consequently, sustainable changes in education could only be achieved by affording teachers the opportunity for dynamic interaction between their inner lives of the spirit and emotions and the outer lives of their work in schools.

The findings of the current study concur with those of Mansour (2008a, 2010), concluding his research in Egypt as a country of similar background to the KSA, who found that teachers’ beliefs on their practices were influenced by the wider social and cultural context. Mansour (2008a) distinguished between the situation of teachers’ identity with particular personal religious beliefs and teachers without these beliefs. However, the current study adds more description of this identity regarding the development of thinking in terms of the impact of the holy texts (the Qur’an and the Sunnah), the biography of the prophet Mohammad (peace be upon him) and asking remuneration ‘Wages’ from Allah "God". Therefore teachers’ religious beliefs influenced their roles, their attitudes towards their students, their pedagogical strategies and how they dealt with their sense of frustration (See Chapter Five, Section: 5.3.1.1).

Data analysis findings also indicated that it was not just the accumulation of personal religious beliefs that had a significant impact on teacher identity when teaching thinking skills in the classroom; the study also found that combinations of many different agents contributed to determining their ‘spiritual/cultural inner motivation’, such as the teacher’s life, experience,
background and motivation, which were reflected in the teacher’s way of teaching thinking skills in the classroom. Also, the level influence of each element of spiritual/cultural inner motivation was different (see Chapter Five, Section: 5.3.1.1, 5.3.1.2 and 5.3.1.3). This finding concurred with Mansour (2008a), who claimed that past experiences and the background of the teacher, in conjunction with their personal religious beliefs, were formative influences on teacher identity. In this respect, Day et al (2006) elaborated further on the idea that teachers’ lives, experiences, beliefs and practices are integral to one another and, consequently, are influenced positively or negatively by the contexts in which these occur and which then affect their teaching practices. Theme Four elaborates these dimensions.

8.2.4 Overarching theme four: The effects of teachers’ and students’ identities on teachers’ and students’ performance of thinking skills

Much research has demonstrated the significance of an understanding of teacher identity, and consequently the effects of these on their performance (Day et al, 2006). The findings of the current study clearly demonstrate that the teachers’ identities are a crucial part of the way teachers’ thinking skills pedagogy operates in the classroom. Teacher identity in the current study results from the dynamic interaction of social, cultural and emotional factors and this identity contributes to moulding teachers’ performance. This study’s findings concur with the argument of Day et al (2006) that the interrelationships between professional and personal identities are ‘unavoidable’, and teachers’ professional identities are influenced by how teachers feel about both themselves and their students.

The findings of the study showed that some teachers held positive attitudes and a sense of identity with their job, their roles, and their relationships with their students, which constitute a crucial element for thinking skills processes in the classroom. This positive attitude and sense of identity could be called a “progressive identity”, which indicates a positive personal reflection on teachers’ professional performance. Cases 3, 4, 7 and 6 teachers respectively offer examples of a progressive identity in their classrooms in which they have self-awareness of their role as well as strong interrelationships with their students (see Chapter Six, Section: 6.3.1.1).

The findings also indicate that for progressive teachers their identity had a particular influence on teachers’ positioning in nurturing thinking skills. This progressive identity defines their attempts to translate their personal and
professional identity into classroom performance which promotes their students’ thinking skills. For example, the findings indicate that those progressive identity teachers, in general, seem more willing to apply strategies for teaching and learning thinking skills and for developing their students’ thinking skills (see Chapter Five, Section: 5.2.3; Chapter Six, Section: 6.3.1.1). This study’s findings concur with those of Day (2004, 2006), concluding that a positive sense of identity with their subject, roles and relationships with pupils is significant in maintaining motivation, self-esteem, commitment and satisfaction in teaching.

However, this research emphasizes that teachers’ progressive identity could not be applied in their professional practice in some cases because a variety of powerful challenges faced them, such as lack of time and the number of students in the class. This had an influence on the teachers’ performance in that it pressured them to re-form their identity into one which may not be to their liking (see Chapter Five, Section: 5.4.1). This study’s findings concur with those of Mansour (2008a: 203), concluding that ‘constraints enable traditional practices and restrict the constructivist practices’.

From this perspective, the findings above lead to the argument that teachers’ progressive identity is not constant and uniform, but that it is constructed and modified within a variety of interactions between the social and cultural resources, university preparedness and physical circumstances surrounding them. This study’s findings concur with those concluded by Cooper and Olson (1996) Day et al (2006), and Mansour (2008a). Day et al (2006: 613) concluded that ‘teachers’ professional identity is not always a stable entity, therefore, teachers want support from various organisation in the community to deal with the demands of the large and great mission entrusted to him’. Furthermore, to Cooper and Olson (1996: 80), teacher identity is ‘continually being informed, formed, and reformed as individuals develop over time and through interaction with others’.

On the other hand, the findings of the study showed that there were other teachers who held a negative identity, whether in attitudes, sense of identity with their job, their roles, or relationships with their students. These kinds of identity which tend to be more traditional are extremely powerful in constraining the thinking skills process in the classroom. Case 2 and 5 teachers offered examples of such a negative identity causing their students to suffer from a number of constraints in their classroom (see Chapter Six, Section: 6.3.2.1).
Interaction within and between the external and internal influences (see Chapter Five, Section: 5.3.1 and 5.3.2), in agreement with Mansour (2008a), can have profoundly positive or negative effects on the teachers’ professional identity which is then reflected in the teachers’ performance of the thinking skills process in the classroom. Furthermore, Rodrigues (2005) made a similar finding which brought to light the significance of teacher training on pupils’ progress. Feedback from learning improvements, practice and classroom experience prompted change in the teachers’ professional identities when teaching thinking skills.

Analysis of the data showed that, not only are teachers’ identities not always stable, but that this applied to students’ identities as well. Students in cases 3 and 6 were clear examples of this (see Chapter Five, Section: 5.3.2.5; 5.4.2.2). The data analysis showed that the teacher, as a social and physical agency within the environment, had a high degree of influence on (re)forming students’ identities in the classroom, whether as a positive or a negative identity towards the learning of thinking skills.

Finally, teaching and learning thinking is a unique case of teacher and students. It requires different sorts of pedagogic skills from those required in other types of teaching and is based on a fundamental shift in beliefs about the nature of teaching and learning. It is therefore essential to implement effective strategies for the professional development of teachers (Adey, 2006 a).

8.3 Chapter summary

This chapter focused on the main thematic findings that emerged from the qualitative data analysis in relation to the existing literature. The next chapter will conclude the current study.
Chapter Nine

Conclusion
9.1 Introduction

This chapter considers an overview of the study design outlining its aims and how these were met. It considers some of the study’s limitations, followed by implications for policy makers, teachers and students which could lead to promoting teaching and learning thinking skills in the KSA. The chapter concludes with suggestions for future research in the area of thinking skills.

9.2 Overview of the study

This study was carried out to gain a deeper understanding of teachers’ and students’ experience of teaching and learning thinking skills throughout parts of the national curriculum (science and Islamic education) for primary schools recently published by the MOE. The study’s aims were:

- To explore teachers’ and students’ experience of teaching and learning thinking skills in the KSA primary curriculum;
- To investigate the impact of the factors which appear to guide teachers’ and students’ experiences of thinking skills in the classroom;
- To identify possible challenges that may face teachers and students in teaching and learning thinking skills.

In order to pursue these aims, the research questions were formulated as follows:

1) What are the experiences of male teachers and 10-12 year-old students of teaching and learning thinking skills in the KSA primary curriculum?
2) What factors appear to guide teachers’ and students’ experiences of thinking skills?
3) What are the main perceived challenges facing teachers and students when they are teaching/learning thinking skills?

To answer the research questions, the interpretive paradigm was used and this was appropriate for the aims of the study. In order to investigate the phenomenon through a range of sources within its natural environment, as
well as to relate it to the interpretivist, social-constructivist framework, the current study used a case study approach method to give in-depth, detailed and illuminating understanding of the issue of the study. Three instruments were used for collecting data: semi-structured interview, classroom observation, and group discussion. These supplied a rich variety of data regarding teaching and learning thinking skills, permitting triangulation which strengthened the findings (see Chapter Four, Tables 4.4).

Ultimately, four overarching themes related to the experience of teaching thinking skills in the KSA context emerged through the data analysis processes. These are of particular significance to teaching and learning thinking skills in the KSA context. These were discussed further with reference to a wider literature (see Chapter Eight, Section: 8.2):

- Overarching theme one: Teachers embracing the infusion approach to thinking skills via textbooks;
- Overarching theme two: Teachers’ and students’ complementary roles;
- Overarching theme three: Spiritual/cultural inner motivation;
- Overarching theme four: The effects of teachers’ and students’ identities on teachers’ and students’ performance of thinking skills.

The most significant contributions of the study to new knowledge were drawn from these four thematic topics as dynamic interdependent processes, in order to extend beyond the conceptual domain to the practical domain when linked to pedagogic implications and to provide a basis from a socio-cultural perspective which would assist in developing both the theoretical and practical aspects of teaching/learning thinking skills in the KSA context. Offering a picture of thinking processes in the classroom can elucidate the structural and technical aspects of teaching and learning thinking skills.

9.3 Limitations of the study

The current study has several limitations. Due to constraints on time and resources, three main issues could not be explored. One of these limitations is geographic as the study is confined to one specific region of the KSA. The seven case schools which participated in the study were all located within one city in the Central Region of the KSA. This presents possible limitations to any transferability of the findings to other areas. However, it may be possible,
if there were more time and resources available to extend the study to other regions, to explore the replicability of the findings across the country.

Another limitation is related to the gender of the sample, in that all participants were male, because the educational system in the KSA segregates schools according to gender. Thus, I was barred from female primary schools and was unable to develop this study with female primary teachers or students. This limits the possibility of extending the findings to female primary schools in the KSA.

Another limitation is related to the rich data which was obtained from the seven cases regarding teaching and learning thinking skills. There was richness to the material and multiple data sources, in addition to multiple interpretations of experiences of the teaching/learning thinking processes. Thus, the wide research environment was made visible and open to challenge but, at the same time, it formed a limitation of the study in terms of the richness of the material and multiple data sources which highlighted the existence of a number of gaps which needed filling. In order to get a more comprehensive perspective on the teaching of thinking in the classroom in the KSA context would take a long time and official effort. Some of these gaps will be suggested as future research as will be mentioned later in this chapter at Section 9.5. In addition, the context of the current study was in a state of social and political change, forming another limitation. Thus the picture is changing over time, especially in light of the Arab Spring in 2011 and what has followed, so it is a very rich capture of a crucial historical point. There is a lot here that can inform what happens next, to make a historically important study.

9.4 Implications of the study

The findings of the study may have a variety of significant practical implications which could improve teaching and learning of thinking skills in the classroom in the KSA primary context. Identifying these implications could assist in creating/improving the successful dynamic teaching and learning of thinking skills. These implications are described below.
9.4.1 Implications for policy makers and the curriculum

Policy makers have realized the importance of developing students’ thinking skills in the education system. However, it could be argued that the current Ministry of Education (MOE) efforts have focused more on providing resources to inform thinking skills by embracing the infusion approach to integrating thinking skills within textbooks, to the neglect of other essential elements in the successful development of thinking skills, for instance teachers’ preparation for acceptance of the infusion approach. Such a partial application of thinking skills in the education system raises some challenges to achieving the objectives of policy makers. This study revealed that various challenges faced both teachers and students when dealing with thinking skills in the classroom (see Chapter Five, Section 5.4). Thinking skills are processes which develop progressively.

Despite the importance at the time of the KSA official policy documents issued in 1970 as guidance to the KSA educational system, these were designed to meet the needs of society in the international context of that time, but the local and international contexts have changed and there have been no subsequent amendments to these documents. Thus, I could argue that it is time for the policymakers to re-think, reorganize and renew the policy documents. Policies should be altered to reflect recent changes in the international political and economic climates and the circumstances surrounding the KSA, particularly in light of the Arab Spring. It is necessary to ensure the continuing suitability of policy documents as guidance for the future of the KSA educational system. Especially in regard to the development of thinking skills, which are not clearly addressed in the recent policy document, it is important to ensure a better conceptualisation so that future educational policy can proceed from a clear vision which is relevant to the KSA context.

The study indicated that there was a lack of awareness at the MOE of the significance of integration between successful dynamic elements of teaching and learning thinking skills in the classroom. The Ministry had focused on the infusion of thinking skills into the textbook content without addressing other essential elements, including teachers’ university preparation and professional training courses for teachers. There may be two reasons for this. One is a lack of communication between the MOE and the Ministry of Higher Education (MOHE). Thus the intellectual needs of teachers when attempting to teach thinking skills in schools may not have been brought to the attention of universities who train teachers for this role. This follows from the finding
of this study that the lack of university preparation presented a serious challenge to those teaching thinking skills in the classroom. A second reason is the lack of communication between the MOE and teachers. To develop teachers’ ability to teach thinking skills requires the MOE to work in partnership with teachers, take into consideration teachers’ views, and engage them in any change in the curriculum process. For example, when the MOE introduced the infusion approach in the textbook, teachers should have been prepared for this change through meetings, workshops and dialogue between themselves and the MOE to ensure that educational changes match educational needs. Bearing in mind that schools’ source of financing in the KSA is mainly the MOE, these sort of professional training courses should have been provided instead of just giving teachers booklets on teaching thinking skills. Therefore, clear communication channels, whether between the MOE and the MOHE or between the MOE and teachers, could assist in bridging the gap between them. Also, such communication channels would help teach student teachers at the university the skills they will need when teaching in school and thereby take the KSA education forward to better serve the next generation. In this respect, adapting programmes to e-learning such as ‘the development of open and distance learning’ could help to achieve high quality outcomes from initial teacher education programmes, particularly if the school experience and school staffs (such as mentors) act in support of such trainee development programmes (Burgess and Shelton Mayes, 2010).

In the KSA, the MOE is responsible for planning, organisation and guidance of the education system. It has the ultimate control to influence teaching and learning thinking skills in the classroom as part of the education system, as set out in the education policy of the KSA. If they want reform and reconstruction of thinking instruction in schools, they need to start with the teachers, helping them to be effective in teaching thinking skills. To this end, the MOE should increase awareness of the significance of thinking skills among educationalists, especially among such teachers as those who were reported as ‘traditional’ cases in this study. Furthermore, I would argue that the main challenge facing the MOE to enhance the quality of thinking instruction is the level of teacher professionalism, especially in light of the lack of understanding of thinking instruction culture in the KSA context, as discussed in the previous chapter. The quality of teaching remains a major international challenge (Burgess and Shelton Mayes, 2010).

Therefore, the MOE is responsible for providing adequate professional training courses for all teachers, as the teachers in the study expressed the desire for help in understanding their proper roles so that they could succeed in their task of teaching thinking skills correctly. Teachers need materials
based on adequate theoretical frameworks which provide them with a deeper understanding of the nature of the infusion approach, the knowledge and skills to successfully implement thinking skills in the classroom, and strategies for addressing issues, problems and difficulties which may arise. This type of training course is not available in the KSA according to the local Ministry of Education’s plan of training programmes for the second term, 2009-2010 (See Appendix 10). However, according to some interviewees, the quality and quantity of the training courses presented by the MOE was limited. Therefore, suggestions indicated that training courses should be practical and appealing, and that they should build relationships and exchange of expertise between private and public (the MOE) institutions. If the MOE could raise the level of its professional training courses this would encourage teachers to engage with its courses. In this regard, some interviewees suggested the MOE should make it compulsory for teachers to participate in training courses, because, at this moment in time, participation for training courses is not obligatory.

Textbook exercises are considered one of the principle resources for students, and are influential in encouraging the development of students’ capacities and skills. However, the study brings to the attention of decision makers and curriculum developers that some of the exercises are too challenging, as was shown from the data collection (see Chapter Five, Section 5.4.3). Supporting the exercises by different designs such as pictures and websites, and clarifying some thinking skills terms in the exercises by brief explanations will make textbook exercises more engaging. This would be beneficial both as scaffolding and for sharing responsibility between the teacher and the learner to ensure that the textbook exercises are interesting and meaningful to students. In this regard, some examples and models of solutions at the beginning of the textbook exercises would help students become more competent at answering exercises. These prompts to learning could be gradually withdrawn so that learners could eventually reach the answers to the exercises by themselves. In addition, guidance for the teacher in using the textbook as the key object in the lesson would also be helpful. Advice such as giving enough time, applying suitable strategies when tackling the exercises, and explaining the objectives of the exercise, would help teachers to be successful in their job of teaching thinking skills.

The findings indicated that physical aspects of the classroom, including its setting and physical atmosphere, influenced what was taught. It is recommended that provision be made of a good quality physical classroom environment and creation of appropriate conditions for the development of thinking skills for both teachers and students. These could include classroom
access to the Internet as one of the main resources. In this respect, Beyer (1997) emphasised that utilizing multiple resources for information plays a major role in increasing students’ thinking skills and achieving a thoughtful classroom.

9.4.2 Implications for the teacher

The study’s finding regarding teachers’ experience of teaching thinking skills carried the potential for improving classroom practices in teaching thinking skills in several ways, as summarised in the following points:

The study provides a comparison between the most extreme traditional classrooms at one end of the continuum, to the extreme progressive classrooms at the other. A comparison between these cases would be informative in terms of understanding the characteristics of both progressive and traditional classroom environments within the KSA sociocultural setting. Such a comparison would provide teachers with insights on how to develop their performance which would enable them to attempt to modify their professional roles through putting the characteristics of progressive teaching into practice. Therefore, it is recommended that the MOE should establish local programmes, such as peer support and workshops for teachers, as an embedded part of the school environment. Teachers within each school or between schools could ‘blend teachers’ experiences’ aiming to facilitate the successful teaching of thinking skills by changing teachers’ understanding of the theoretical and practical aspects of thinking in classrooms and to share teachers’ knowledge and experience of teaching thinking skills among those who participate. Through peer support and workshops, teachers’ experience could be transmitted. Teachers have be able to assimilate the principles underlying their role as guide and facilitator of thinking operations in the learning environment, addressing thinking skills in the classroom and smoothly incorporating thinking skills activities into their lesson practices, within innovative teaching strategies and with techniques for organizing thinking skills.

The findings of the study indicate that teaching and learning thinking skills cannot be understood in an isolated way, that a large range of internal factors relating to teachers’ beliefs had significant consequences for teacher effectiveness in many aspects of daily life; their culture and social environment had shaped teachers’ performance when developing their
students’ thinking skills in the KSA context. It is found that teachers’ cultural and religious background may drive and promote their attitudes and stimulate their teaching of thinking skills. Therefore, investment in and support for teachers’ beliefs, particularly those teachers who suffered from a lack of motivation or support from their school environment, or who were frustrated with their colleagues, would be useful in many cases.

In addition, it is important to take into account teacher motivation as one of the features of the perceived internal factors. According to some interviewees, the MOE and local school should support teachers who could be classified as active ‘progressive’ teachers, especially in light of the lack of financial incentives for teachers, whether traditional or progressive. It is recommended that, to urge teachers to teach thinking skills, the MOE should review teachers’ incentives and distinguish between progressive and traditional teachers; this should improve their performance in the classroom regarding thinking skills.

This study stressed that there was a dynamic interaction between different elements which, when embedded in the progressive cases, were effective in bringing about the successful dynamic teaching and learning of thinking skills in the classroom. It is hoped that these components will provide a framework which may lead to an understanding of the nature of teaching and learning thinking skills processes in classrooms within this particular sociocultural context. In addition, these four dynamic components could assist shape teachers’ orientations and practices of teaching thinking skills and open the door for different views and different interpretations of the best ways to achieve the successful dynamic teaching and learning of thinking skills in the classroom and develop teaching plans and practice.

The study found a number of challenges facing teachers’ practices in the classroom when they were teaching thinking skills. Teachers identified these challenges as obstacles or barriers to teaching thinking skills as effectively as they had hoped. I suggest that it is the responsibility of the MOE to assist teachers in finding ways of minimizing these challenges. One of the evident challenges was a lack of training. Teachers emphasised that they had requested in-service professional development courses to give them better understanding of the nature of thinking skills and how to teach them. They wanted guidance on strategies to improve their classroom performance in this area. They also wanted clarification of their roles, in light of the change from the teacher’s traditional role as controller to produce highly professional teachers’ complementary roles in their classrooms. Clarification of teachers’
roles, and consciousness of the challenges that students may face throughout the process of learning thinking skills, will be reflected in their application of thinking skills to help them to overcome those challenges and provide an appropriate interactive environment for teaching thinking skills in their classrooms.

9.4.3 Implications for students

The study’s findings concerning students’ experience of learning thinking skills showed that there were many ways in which this learning could be improved:

One of the main contributions of the current study is that there is not one teaching strategy that fits all thinking skills in the classroom. Therefore, learning thinking skills requires diverse strategies that will help teachers to move away from the traditional strategy and help students to become more interactive. In this regard, one finding was that collaborative learning was one teaching strategy that had a significant influence when dealing with thinking skills. The majority of the students emphasised collaborative learning as ‘the best’ way to develop their thinking skills. As McGregor (2007: 271) has pointed out, “tactically supporting peer collaboration can support development of pupils’ thinking”. In discussion, students expressed the view that collaborative learning allowed them to be more dynamic throughout the thinking skills process; and that collaborative learning allowed them to benefit from each other and collect their ideas together.

This study stressed that the relationships between teacher and students, or between students themselves, were features of classroom interaction which could institute either a positive or a negative atmosphere for promoting their thinking skills. Therefore, it is recommended that the MOE should address these issues by supporting the existence of complementary relationships between teachers and students in the classroom, retaining the minimum requirements of a formal relationship for the efficient working of the class. The school culture and values should promote a safe environment as a right for every student in the classroom, particularly in light of the Arab Spring and looking to the spread of citizens’ rights.
The findings of the study indicate that students require knowledge and skills to know how to apply thinking skills to the textbook exercises. Therefore, it is highly recommended that the spread of a ‘thinking culture’ among students be encouraged by providing adequate frameworks and activities. For example, the advantages of the extra-curricular program, as a framework which had a great influence on participants by contributing to the development of their thinking skills and urging them to think and create new things outside the official school curriculum, is undeniable. It is recommended that extra-curricular programmes be extended to all schools. This would facilitate students’ learning of thinking skills by giving them a better understanding of the meaning of the thinking skills perspective and teaching them a variety of strategies for developing thinking skills. Students would also acquire a variety of thinking tools and knowledge of a wide range of thinking skills which would help them to be more interactive when dealing with thinking skills exercises in the classroom.

The findings of the study indicate that there were a number of challenges facing students in the classroom when they were learning thinking skills. This highlights the need for all teachers, educationalists, partners and decision makers to clarify their roles and find ways for minimizing these challenges and reduce the effects of obstacles. Also, to help bring into existence all the requirements of the actual dynamic interactions of thinking skills in a classroom environment in order to support students’ thinking.

9.5 Suggestions for Future Research

In light of the study findings, I hope that this study will encourage and lead other researchers to pursue points raised here to extend their scope and depth. The following points can be summarized:

The current study was conducted in primary schools; another study could be conducted in the intermediate and secondary schools because there is a different context between primary schools and the intermediate and secondary schools, particularly with regard to the nature of interaction between students. Therefore, a survey examining teachers’ and students’ experience in the intermediate and secondary schools would be useful. Longitudinal psychological development studies across all school ages would deepen our understanding of the successful teaching and learning of thinking.
skills in the classroom, showing how practices in earlier years affected learning in later years.

The study indicated that lack of professional knowledge was a challenge facing teachers, in that their university preparation had been inadequate for the learning and teaching of thinking skills, as their ‘university preparation was just information and traditional theory’. Findings such as these raised questions about teachers’ university preparation in terms of developing their knowledge and practice. There is a need for research on teachers’ university preparation regarding the application of thinking skills in the classroom, and its various aspects such as use of the textbook. Therefore, developing such pre-service programmes would be useful for both the MOE and the MOHE as they are responsible for pre-service and in-service teacher training. Studies such as this one could assist in opening up communication channels between these institutions.

The findings also revealed the importance of professional in-service training courses in filling the gaps from teachers’ university education in terms of helping them to gain an improved understanding of thinking skills processes. In this regard, the local department of the MOE had provided some in-service training (see Chapter Five, Section 5.2.2) but the findings revealed an unwillingness to participate in these courses. A research study could be implemented to explore the reasons behind teachers’ unwillingness to participate in the in-service training courses, and to identify the real needs of teachers which could be met by professional in-service training courses regarding teaching thinking skills. Such a study would be useful for the MOE as it is responsible for planning and organising professional in-service training programmes.

This study highlighted the role of religious motivation among teachers when teaching thinking skills. It was found that the Islamic view of thinking had a significant influence on teachers’ motivation. However, a deeper understanding is still needed of how the Islamic holy texts influence teachers when teaching thinking skills. It would also be useful to explore how personal religious beliefs help teachers when facing challenges in the classroom when teaching thinking skills, such as by Islam’s view of asking remuneration ‘Wages’ from Allah "God".

The findings of the research indicated that teacher’s positive identity plays a major part in teaching and learning thinking skills. Therefore, it is necessary to examine the nature of teacher’s identity to show how it informs the teacher’s performance regarding teaching thinking skills in the classroom.
Moreover, there is also a need for research on how educationalists support and maintain teachers’ positive identity.

The findings revealed that having insufficient lesson time was one of the main problems facing teachers and students in the classroom when teaching learning and thinking skills. However, the findings indicated that teachers had differing views about the adequacy of lesson time even in the progressive cases. Therefore, a study could be conducted to reveal the reasons behind the different views and the best ways for teachers and students to cope with the pressure of time and the density of the curriculum.

The study showed evidence of the transfer of thinking skills to new contexts, at least by some students, while acknowledging that this transfer was not an easy or automatic process. However, this issue was not pursued in any depth. Therefore, there is still a need for future researchers to investigate the factors that may assist the transfer of thinking skills, such as the thinking skills exercises and extra-curricular programmes.

9.6 Final Comments

The current study has addressed issues related to the KSA experience of teaching and learning thinking skills in primary schools within a specific social-cultural context and how these experiences affected thinking skills processes in classroom contexts. The study yielded several findings about factors and challenges that influence teaching and learning thinking skills. Four significant outcomes are highlighted. The first is that teachers embracing the infusion approach to thinking skills as a natural part of the subject matter in textbooks was one of the most influential elements. The textbook is a key source of thinking skills for both teachers and students and the infusion approach created regular opportunities for promoting and practising these skills.

Secondly, the study has highlighted the importance of the actual dynamics of interactions in classroom contexts via teacher’s and students’ complementary roles. The creation of a safe classroom atmosphere where issues of power are addressed and where teacher and students play complementary roles were found to be indispensable elements in the successful teaching and learning of thinking skills. Thirdly, spiritual/cultural inner motivation greatly influenced and shaped teachers’ and students’ practices of teaching and learning.
thinking skills. This spiritual/cultural inner motivation included, most notably, the teacher’s personal religious beliefs, the teacher’s life experiences from their own background and past school experiences, and teacher’s and students’ motivation. This outcome emphasises the importance of the dynamic interaction and integration within and between internally influenced power and externally influenced power in creating a classroom where thinking skills can flourish. Fourthly, the study has shown the crucial importance of teachers’ and students’ identities on their performance of thinking skills.

These four elements work together in a dynamic relationship in the particular socio-cultural context. In the end, teaching and learning thinking is a unique case for both teacher and students, when they are teaching and learning thinking skills in the classroom, so understanding these components may be central in contributing to the successful dynamic teaching and learning of thinking skills in the KSA classroom.

At the end of this research journey, I find that my knowledge of and attitude toward the issue of research has changed immensely; it has become wider and more holistic. My belief in the significance of establishing an optimum classroom atmosphere for the teaching and learning of thinking skills has also been strengthened. I believe that it is necessary to move beyond a narrow focus on the teaching and learning processes, to create and support characteristics of the classroom in which successful teaching and learning of thinking skills can occur. This involves the development of individuals’ knowledge and attitudes in order to generate the best possible environment and to avoid the pitfalls; together these should result in the successful teaching and learning of thinking skills in the KSA classroom, which should produce skills which can be developed throughout life in a learning society.
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Appendices
Appendix 1

An example of a textbook exercise

This Appendix shows a unit from a textbook as an example of how teaching and learning thinking skills are incorporated within a textbook exercise from Islamic Education in the primary education curriculum in the KSA for 2009-2010. The Module is Alhadith (Year Six) and this particular unit is entitled ‘Compassion to people’. All units in the textbook begin with a brief text from the special holy book (Sunnah) in which Mohammed (peace be upon him) said his words of wisdom. This is followed by a biographical outline of the person who is telling this text because, for every holy text of the sayings of Mohammed (peace be upon him), we must know who is actually telling it. This gives greater reliability. Then a brief summary is given of the good personal qualities exemplified for the students, followed by a statement of the meanings of the words in the text, and then followed by the directives and the benefits to be derived from this text, and lastly some exercises which involve thinking skills regarding the subject of the unit.

The reason for choosing this unit is that some students’ interviews emphasized that this exercise had a great effect on them, particularly exercise number two. Also, some of the issues raised by participants were chosen from this unit, such as the transfer of thinking skills to real life situations. Finally, I would like to acknowledge that this unit has been translated from Arabic into English.
Mercy is one of the attributes of God; and God loves the merciful; and God punishes those who do not have mercy, as related in the holy Sunnah text below:

Narrated by Jarirbin Abdullah (may Allah be pleased with him), who said: The messenger of Allah (peace and blessings of Allah be upon him) said: “God is not merciful to one who is not merciful to people”.

Biography of the Narrator who tells this text

The narrator’s name is Jundub bin Abdullah Al-Bajali (may Allah be pleased with him).
His attributes: He was one of the famous knights, and he said that the Messenger of Allah (peace be upon him) did not prevent him from entering to him since he became Muslim, and he always had a great smile on his face when he met me.
He died in 50 A.H/672 CE.

The directives and the benefits derived from the subject of the text.

1. Being merciful to people calls for a Merciful God.
2. Being merciful to people is one of attributes of true believers.
3. Being respectful to people, helping them, and caring about them are characteristics of mercy.
4. Maids, drivers and workers should be well treated and not harmed; this is showing mercy to them.
5. Being heavy-handed, cold and cruel is not being merciful to people.
6. Caring for orphans, giving them money and meeting their needs is being merciful to them.
An Exercise

1. Suggest examples of merciful behaviour with maids, drivers and workers which others which show unmerciful behaviour.

<table>
<thead>
<tr>
<th>Examples of merciful behaviour</th>
<th>Examples of unmerciful behaviour</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Think of the opposites to these types of behaviour (ethics) towards others

<table>
<thead>
<tr>
<th>Behaviour (ethics)</th>
<th>Opposite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mercy</td>
<td></td>
</tr>
<tr>
<td>Compassion</td>
<td></td>
</tr>
<tr>
<td>Arrogance</td>
<td></td>
</tr>
<tr>
<td>Cruelty</td>
<td></td>
</tr>
</tbody>
</table>

3. Compare merciful people and unmerciful people in the following table:

<table>
<thead>
<tr>
<th></th>
<th>Merciful</th>
<th>Unmerciful</th>
</tr>
</thead>
<tbody>
<tr>
<td>Their Style of speech</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Their behaviour</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Their relationship with God</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Their relationship with people</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Evaluation

1. Choose the correct answer:
One of characteristics of mercy towards animals is:

- Pulling the animal forcefully
- Feeding the animal carefully
- Keeping the animal in the sun

2. How can we ensure that the elderly receive the right of mercy?

3. Can you remember the most important attributes of the person who tells this text?

Information enrichment

Narrator Hadrat Abu Hurayrah (may Allah be pleased with him), who said: The messenger of Allah (peace and blessings of Allah be upon him) said: "While a man was walking he became very thirsty, so he descended into a well and drank from it. When he came out he found a dog panting and eating the soil due to thirst. He said, 'This creature is suffering what I suffered,' so he went down again, filled his shoe and climbed up holding it in his mouth to give drink to the dog. Allah appreciated that from him and forgave his sin." His companions asked, "O Messenger of Allah, is there a reward in [kindness to] animals?" He replied, "In every living creature there is reward." (Muslim 1761/4 2244)
Appendix 2

Teachers’ semi-structured interview schedule

Teachers’ preparation

1. **Teachers’ mean of thinking skills:**
   - What is your concept of the term “thinking skills”?

2. **Preparation / In-service training**
   - How well prepared do you think you are for teaching thinking skills?

   Responses may enable exploration of:
   - What kind of preparation related to thinking skills did you experience during your first degree at University / College?
   - Have you had in-service training / short courses/ workshops about thinking skills after you became a teacher? If not, do you feel it is important ; and for those for whom it is relevant:
   - In your opinion, how do short courses such as these across in-service training influence teachers’ individual professional experience?

3. **Importance and impact of thinking skills**
   - What do you see as being the point of teaching thinking skills?

   Responses may enable exploration of:
   - Are thinking skills useful for our society? How?
   - What do you think the place of thinking skills is in teaching and learning?
   - What do you think about the inclusion of thinking skills in textbooks?
   - In your opinion, Do you think development of students’ thinking skills reflected in determining your actions in the classroom?

Application of teaching thinking skills:

1. **The strategies and techniques used when teaching thinking skills:**

4. What do you see strategies and techniques as being the point of teaching thinking skills?
Responses may enable exploration of:

- How do the thinking skills strategies fit with your usual practices?
- What strategies do you use to teach thinking skills?
- Through the application of strategies and techniques of thinking skills in your classroom, what have been students’ reactions? -I mean by this question, asking teachers for their perceptions of their students’ reactions NO for the teachers to comment on the strategies they use-.
- How do you know when learning of thinking skills is occurring in your classroom?
- In your opinion, why some students are reluctant to participate and experience difficulties during thinking skills lessons?
- Have you observed any changes in thinking skills in your students since they were exposed to thinking skills in the classroom?
- Is there any visible evidence for transfer of thinking skills in your classroom? What are some examples of this?

The influences which appear to guide teachers’ experiences of thinking skills:

First, the perception of the internal influences:

- Relationship between thinking skills and beliefs:

5. What do you see relationship between thinking skills and beliefs an essential influence for the point of teaching thinking skills?

Responses may enable exploration of:

- Have you thought about the relationship between thinking skills and religion before? What do you think about this relationship?
- Do you think Islam supports the learning of thinking skills? Is Islam’s’ view of learning thinking an essential influence for you?

- Beliefs about teaching controversial issues:

The debate about Islam and thought extends to a debate about the relationship between Islam and the intellectual domain; particularly, what are the sources from which knowledge is derived? Then, how is it to be understood and explained? There are controversial issues within thinking skills education, for example, a view that sees equality between reason and revelation, evidence and sources, or even supremacy of reason over revelation in some areas of knowledge or morality.
6. What do you see teaching controversial issues?

Responses may enable exploration of:

- What do you think teaching controversial issues in Islamic culture - a debate about the relationship between Islam and the intellectual domain -?
- Do you think the teacher should engage with this issue in the classroom?
- Do you have confidence to teach such issues?
- In your opinion, what are the key factors that can help you to teach such issues well - a debate about the relationship between Islam and the intellectual domain and a view that sees equality between reason and revelation -?

Other, Potential influencing factors:

7. From your point of view, what do feel about the intellectual level of your students’? Did you have any previous perspective on students’ intellectual levels? If yes, what is it? And why?

Second, the perception of the external factors:

8. What do you see the perception of the external influences may have influence for the teaching of thinking skills?

Responses enable exploration of:

- Are there any potential influences of local cultural factors that may influence the way you teach thinking skills?
- In your opinion, what the key factors into school environment that may influence the way you teach thinking skills?
- In your opinion, what role should the teacher adopt when dealing with the thinking skills process?
- In your opinion, how parents can play an essential part of thinking skills process that their efforts may integrate with your teaching thinking skills?
- What do you think should be the primary role of the textbook regarding thinking skills education?
- In your opinion, what do you think the textbook should do to make it easy for you to apply thinking skills in your classroom instruction?
9. What do you see the perception of the obstacles may have influence for the teaching of thinking skills?

**Responses may enable exploration of:**

- Are there any obstacles to the application of thinking skills in your classroom?
- How would you describe the student population? Do you feel the students present obstacles?
- In your opinion, what are the most serious obstacles in school that form barriers when you teach thinking skills?
- How do student-student and students-teacher relationships affect the teaching of thinking skills?
- Do you think that weakness in literacy constitutes an obstacle to learning thinking skills, because the student focuses on correcting his mistakes rather than learning the skills of thinking?
Appendix 3

Students’ semi-structured interview schedule

In this interview, I am interested in what you think about learning thinking skills, if you don’t understand any questions please ask me to clarify them. You do not have to answer the questions but please tell me if you don’t want to answer any specific question.

- **The student’s enjoyment:**
  1. What subjects do you like in school?
  2. Do you ever get taught thinking skills? What is that like?

- **Importance and impact of thinking skills**
  3. What do you think about learning thinking skills?
  4. How do you find learning thinking skills?
  5. Do you like talking about your ideas /thinking/feelings with the other boys within collaboration process in class?

- **Application of teaching thinking skills:**
  6. Do you think that thinking skills into exercises in textbooks is useful for you?
  7. When you go home in the afternoon, do you tell anyone in your family about it?
  8. Do you try to copy/imitation what you learned in into exercises in textbooks in your daily life?
  9. Do you feel confidence when learning thinking skills?
 10. What things make learning thinking skills difficult?
 11. What do you think about weakness in literacy skills that it may be difficulty to learning thinking skills?
Appendix 4

The consent forms for all participants involved in the study

Dear Parent/teacher/head of teacher

Researcher Abdulrahman M Alnesyan will be working in the school over the coming few months, Aiming to explore teachers’ and children’s perspectives on and current approaches to the teaching and learning of thinking skills in the KSA primary curriculum; and to identify how these teaching and learning processes work in actual classrooms; and to identify possible obstacles that would face both teachers and children in developing these skills.

Over twelve weeks the researcher will make visits to the classroom to observer both teachers and children, also, the current study will support via five pupils chosen as volunteers to interview and be interviewed by the researcher, from Y5 or 6, in documenting and reflecting on their own learning (and the learning of one another), also, the learning of others in their year.

The project is being carried out as a PhD study. It adheres to the British Educational Research Association ethical guidelines and I have an Enhanced Criminal Record Bureau Check in the UK and an Enhanced Criminal Check in the KSA.

Please read the enclosed information and when you are happy, complete the Informed Consent form, and return it to your child’s class teacher.

If you have any questions about the research, please get in touch with me via the school.

Yours sincerely

Abdulrahman M Alnesyan

Doctorate of Education Candidate in Thinking Skills.
Graduate School of Education
University of Exeter
Informed Consent Form for students

I agree to take part in the teaching and learning thinking skills research project. I understand that agreeing to take part means that I am willing:

- For the researcher to observe teaching and learning situations in my classroom;
- For the researcher to video record lessons which (like the field notes) will be arranged throughout the lessons;
- For the researcher to interview me during the research period;
- To approach the research with a respectful attitude towards all those involved.

I give permission for data about me to be stored securely, analysed and published, as part of the research and also for this information to be used within future online publications, written reports, presentations and journal articles which make reference to this research on the understanding that real names and contact information will not be used, unless otherwise agreed.

I understand that my participation is voluntary, that I can choose not to participate in part or all of the project, and that I can withdraw at any stage of the project without being penalized or disadvantaged in any way. Consent can be withdrawn by contacting Abdulrahman Alnesyan: aa313@exeter.ac.uk or abomoath2002@yahoo.com and simply requesting withdrawal.

My Name.................................................................................................................. (Please print)

My Signature: ....................................................................................................Date: ..................................
Informed Consent Form for Parents

I agree that my child can take part in the teaching and learning thinking skills research project. I have read the Information Sheet. I understand that agreeing to take part means that I am willing for:

- My child to be observed by the researcher in teaching situations;
- My child to be filmed;
- My child to be interviewed by the researcher;
- My child to approach the research with a respectful attitude towards all those involved.

I give permission for data about my child to be stored securely, analysed and published, as part of the research and also for this information to be used within future online publications, written reports, presentations and journal articles which make reference to this research on the understanding that real names and contact information will not be used, unless otherwise agreed.

I understand that my child’s participation is voluntary, that I or my child can choose for them not to participate in part or all of the project, and that I can withdraw them at any stage of the project without being penalized or disadvantaged in any way. Consent can be withdrawn by contacting Abdulrahman Alnesyan: or abomoath2002@yahoo.com and simply requesting withdrawal.

Name of child (referred to as ‘my child’ in this document)

............................................................................................................... (Please print)

Name of parent or carer............................................................................. (Please print)

Signature of parent or carer: ............................................. Date: .......................

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Informed Consent Form for teachers

I agree to take part in the teaching and learning thinking skills research project. I understand that agreeing to take part means that I am willing:

- For the researcher to observe teaching and learning situations in my classroom;
- For the researcher to video record lessons which (like the field notes) will be arranged throughout the lessons;
- For the researcher to interview me during the research period;
- To approach the research with a respectful attitude towards all those involved.

I give permission for data about me to be stored securely, analysed and published, as part of the research and also for this information to be used within future online publications, written reports, presentations and journal articles which make reference to this research on the understanding that real names and contact information will not be used, unless otherwise agreed.

I understand that my participation is voluntary, that I can choose not to participate in part or all of the project, and that I can withdraw at any stage of the project without being penalized or disadvantaged in any way. Consent can be withdrawn by contacting Abdulrahman Alnesyan: aa313@exeter.ac.uk or abomoath2002@yahoo.com and simply requesting withdrawal.

My Name
................................................................................................................. (Please print)

My Signature: ...........................................................………Date: .............................
Informed Consent Form for head of teachers

I agree for the school which I supervise to take part in the teaching and learning thinking skills research project. I understand that agreeing to take part means that I am willing:

- For the researcher to observe teaching and learning situations in classrooms;
- For the researcher to video record lessons which (like the field notes) will be arranged throughout the lessons;
- To allow interviews to be arranged throughout the research period;
- To approach the research with a respectful attitude towards all those involved.

I give permission for data about our to be stored securely, analysed and published, as part of the research and also for this information to be used within future online publications, written reports, presentations and journal articles which make reference to this research on the understanding that real names and contact information will not be used, unless otherwise agreed.

I understand that our participation is voluntary, that they can choose not to participate in part or all of the project, and that they can withdraw at any stage of the project without being penalized or disadvantaged in any way. Consent can be withdrawn by contacting Abdulrahman Alnesyan: aa313@exeter.ac.uk or abomoath2002@yahoo.com and simply requesting withdrawal.

My Name …................................................................. (Please print)

My Signature: ...........................................................………..Date: ................................
Appendix 5

The overall themes from analysis of students' interviews

Experience:

1. Views of Thinking skills:
   1.1. Personal views of thinking skills
   1.2. Attitude towards thinking skills process
       1.2.1. The student's attitude towards thinking skills process
       1.2.2. Preference part of the activity within each chapter that it is concentrated thinking skills development activities, and why?

2. Strategies and techniques for learning thinking skills:
   2.1. Collaborative
       2.1.1. Students' view for collaborative: importance and impact
   2.2. Dialogue
       2.2.1. Students view of dialogue: importance and impact
   2.3. Repetition
   2.4. Cueing skill practice
   2.5. Using Scaffolding
   2.6. Ask or answer high questions
   2.7. Giving enough time
   2.8. The use of the language of thinking throughout classroom

3. Students' application of the thinking skills process:
   3.1. Critical thinking
   3.2. Brainstorming
   3.3. Produces a links
   3.4. Produces a summary "abbreviation"
   3.5. Thinking upside down
   3.6. Conceptual maps
   3.7. Classify
   3.8. Matrix Standards
   3.9. Management thinking
   3.10. Comparison
   3.11. Creative thinking
   3.12. Problem solving

4. Students' notes for the development and growth of thinking skills and how:
   4.1. The teacher should teach step by step
4.2. A safe classroom environment
4.3. The importance of friendly relationship between the student and teacher
4.4. The teacher's explain method and student's inquiry
4.5. Dialogue
4.6. Collaborative learning
4.7. Enough time
4.8. Create a conditions and appropriate environment to develop thinking skills
4.9. Teacher's strategy for developing answers
4.10. The extra-curricular program
4.11. Answering strategies are included in some of the textbooks

5. Students’ experience with the exercises:

5.1. The Students’ views for exerciser: importance and impact
5.2. Students’ reflection and interaction towards the processes of developing thinking skills within the exercises
5.3. Transmission of the impact of education
5.4. The role of the curriculum
   5.4.1. The curriculum contains pictures and exerciser that it supports the teacher in his task to develop thinking skills

Factors:

1. The perception of internal influences:
   1.1. Self-confidence

   1.2. Motivation
       1.2.1. Teacher rewards
       1.2.2. Students’ motivation
           1.2.2.1. Consent of parents
           1.2.2.2. Admire the teacher
           1.2.2.3. Stimulation and encouragement from the teacher
           1.2.2.4. The teacher uses the language of thinking
           1.2.2.5. Self development
           1.2.2.6. Thinking about the future
           1.2.2.7. Extra-curricular programmes
           1.2.2.8. Competition among students
2. **The perception of external influences:**
   
   2.1. **Social and cultural factors:**
      
      2.1.1. The family role
   
   3. **A safe classroom environment: importance and impact:**
      
      3.1. Freedom
         
         3.1.1. Giving students the freedom to talk
      
      3.2. Equality
      
      3.3. The Student’s views of the characteristics of the ideal safe environment for the building and development of thinking in the classroom
   
   4. **The relationship between students and teachers: importance and impact:**
   
   5. **Extra-curricular programmes:**
      
      5.1. The teachers’ views of extra-curricular programmes: importance and impact
      
      5.2. What is going on during the extra-curricular programmes regarding thinking skills?
      
      5.3. Comparing formal curricular and extra-curricular programmes
   
   6. **The teachers' positive role:**
      
      6.1. Given adequate opportunity to students when solving exercises;
      
      6.2. Tolerant, he’s does not use violence
   
   7. **A classroom environment friendly in order to support students:**
      
      7.1. Sensory factors of an appropriate classroom environment
         
         7.1.1. The student feels that there are some issues discussed in the classroom which are outside the formal curriculum
   
   **Challenges:**
   
   1. Weaknesses in literacy
   2. Students’ difficulty when dealing with some of the thinking skills
   3. A lack of group sympathy in the case of collaborative learning
   4. A lack of confidence
   5. A lack of understanding of the academic subject or its unfamiliarity
   6. Intensity of the academic content and the teacher explaining it too quickly
   7. Absent-mindedness
   8. Teacher penalties
   9. A lack of understanding of the exercises
   10. A lack of understanding of the vocabulary in the exercise questions
   11. Student’s feeling of frustration: causes and consequences
   12. A lack of time available to solve exercises
   13. Power relations
      
      13.1. An unsafe environment classroom
13.2. Fear of ridicule from some students
13.3. Fear of ridicule from the teacher

14. Nervous teacher
15. Teacher as potentially one of the obstacles
16. Use of traditional methods
17. The sense of inequality
18. A lack of a suitable environment for developing thinking skills
19. A lack of opportunities for dialogue
20. The absence of examples and models for solutions within the exercises
21. Teacher does not explain the exercises
22. Classes in rented buildings
23. The students’ pressure and feeling of conflict when dealing with thinking skills when they are integrated with the heavy academic content of the textbook
24. Dealing with thinking skills at the end of a school day
25. Sequence of the main academic subjects in a school day
26. The number of students in the class
27. Longer elaborating and explaining by the teacher
28. Difficult to understand the exercise questions
29. Continuous assessment system
30. Excessive cueing
31. A lack of familiarity with the exercises
32. A lack of opportunities for the development of students’ thinking skills
33. A lack of encouragement from some teachers
34. An unfriendly family environment
35. Problems of students with each other
Appendix 6

The overall themes from analysis of teachers' interviews

Experience:

1. Views of Thinking skills:
   1.1. Personal view of thinking skills
   1.2. Attitude towards thinking skills process
   1.3. Preparation for the lesson
       1.3.1. Attitude towards preparation for the lesson.
   1.4. The teachers’ views of the teaching thinking skills: importance and implications
       1.4.1. The teachers’ views of the teaching thinking skills: importance and implications
       1.4.2. Positive teachers’ views of his student that every student has a number of thinking skills
       1.4.3. Dealing with thinking skills at the same as dealing with the textbook’s academic content
       1.4.4. The teachers’ views for exerciser: importance and impact;
       1.4.5. The teachers’ views of the integration thinking skills within the textbook
       1.4.6. Conviction of the importance of exerciser within the textbook
       1.4.7. Since when has the teacher begun to be interested in teaching thinking skills?

2. Teacher’s preparation:
   2.1. Teacher’s background and preparation
       2.1.1. University preparation or not
   2.2. Teacher’s professional development
       2.2.1. In-service training
       2.2.2. Professional training courses
       2.2.3. Self-development

3. Strategies and techniques for teaching and learning thinking skills:
   3.1.1. Collaborative
       3.1.1.1. Teachers’ view for collaborative: importance and impact
   3.1.2. Ask or answer high questions
   3.1.3. Giving enough time
   3.1.4. Cueing skill practice
   3.1.5. Drawing as a creative method
   3.1.6. Using Scaffolding
   3.1.7. Dialogue
       3.1.7.1. Teachers’ view of dialogue: importance and impact
3.1.8. Using links
   Linking thinking skills to the curriculum
3.1.9. Using a substitute teacher
3.1.10. Feedback
3.1.11. Working in groups or pairs for developing thinking skills
3.1.12. Competing
3.1.13. Repetition
   3.1.14.1. Explore ideas
3.1.15. Make Brochures work "table self-esteem"
3.1.16. Conceptual maps

4. Actual case of teacher's experience for thinking skills development:
   4.1. Teacher's notes for the development and growth of thinking skills and how

5. Students' application of the thinking skills process:
   5.1. Correct the error
   5.2. Criticizes - critical thinking
   5.3. Problem solving

6. The Textbook exerciser:
   6.1. The current textbook “in general”
   6.2. The old curricula “in general”
   6.3. Textbook: A teacher expected to the best textbook for the application of thinking skills
   6.4. The role of the Textbook
      6.4.1.1. The curriculum contains pictures and exerciser that it supports the teacher in his task to develop thinking skills

7. Use technology to develop thinking skills

Factors:
1. Perception of internal influences:
   1.1. Relationship between thinking skills and beliefs (religion)
      1.1.1. Islamic views "background" about thinking
         1.1.1.1. Teacher views' for the Islamic views of thinking
      1.1.2. The effects of the holy text which encourages being a thinker
      1.1.2. The influence for biography of the Prophet Muhammad (Peace and Blessings of Allah be upon Him) regarding developing thinking;
      1.1.3. Wages from "Allah" (God)
1.1.4. A debate about the relationship between Islam and the intellectual domain
   1.1.4.1. Teacher dealing with such issues

1.2. Teacher experience and background

1.3. Human influence factors
   1.3.1. Human mercy factors

1.4. Motivation
   1.4.1. Intrinsic motivation
   1.4.2. Extrinsic motivation
   1.4.3. Teachers’ view for motivation: importance and impact
   1.4.4. Teachers’ motivation
      1.4.4.1. See the students’ development
      1.4.4.2. The teachers’ sense he’s producing
      1.4.4.3. The teacher see the capacity and quality of his students
      1.4.4.4. See students relieved and happy
      1.4.4.5. See the smile on the lips of students
      1.4.4.6. Development thinking culture and realize of the student

2. Perception of external influences:

2.1. Social and cultural factors:
   2.1.1. The social culture
   2.1.2. The social environment
   2.1.3. The social environment and media
   2.1.4. The family role
      2.1.4.1. The effects of family background in the development of thinking skills

2.2. A safe classroom environment: importance and impact:
   2.2.1. Freedom
      2.2.1.1. Giving student the freedom to talking
   2.2.2. Equality
   2.2.3. The teachers’ views of the ideal safe environment characteristics for building and development of thinking in the classroom
   2.2.4. How teacher see his self as a teacher when he develop the capacities and skills of the students
   2.2.5. The student feels soft and comfortable when asking a question
   2.2.6. Answering students ‘questions

2.3. The relationship between teachers and students: importance and impact:

2.4. The role and influential teacher:
   2.4.1. The teachers’ views of the importance of the his role
   2.4.2. The impact of some students’ view of the teacher role

2.4.3. The school environment:
   2.4.3.1. The schools’ support
      2.4.3.1.1. Appropriate classroom
2.5. **Extra-curricular programmes:**
   2.5.1. The teachers’ views of extra-curricular programmes: importance and impact
   2.5.2. Comparing formal curricular and extra-curricular programmes
   2.5.3. What is going on during the extra-curricular programmes regarding thinking skills?

2.6. **A classroom environment friendly in order to support students. (An appropriate classroom)**
   2.6.1. **A physical factors of appropriate classroom environment**
      2.6.1.1. Clean place
      2.6.1.2. Smelling smart
      2.6.1.3. Comfortable chairs
      2.6.1.4. Comfortable
      2.6.1.5. Appropriate classroom environment factors
      2.6.1.6. The classroom contain facility
   2.6.2. **A sensory factors of appropriate classroom environment**
      2.6.2.1. The student has great colleagues who ask excellent questions
      2.6.2.2. There are some issues discussed in the classroom which are outside the formal curriculum

**Challenges:**

1. The teacher's university preparation
2. Used traditional methods, and Why?
   2.1. A traditional school environment
   2.2. Student familiar with the indoctrination
3. Teacher's frustration feeling: causes and consequences
   3.1. An uncomfortable work environment
   3.2. Feeling works alone
   3.3. Feeling the frustration
   3.4. Teacher frustrations about the student level
4. An uncomfortable school building; “rented building”
5. A lack of appropriate school environment -classroom size-.
6. Individual differences
7. An unfriendly family environment
8. A lack of thinking skills process
9. A lack of time
10. The number of students in the class
11. Continuous assessment system
12. A lack of advance planning for the lesson
13. Not to deal with thinking skills at the same as dealing with the textbook’s academic content and why
14. A lack of awareness of the importance of thinking skills into exercises with the textbook
15. A lack of the teachers’ development during and pre-service
16. A lack of opportunities for the development of students’ thinking skills
17. A lack of preparation of teachers and students for the new science curriculum.
18. Teacher as a potentially one of the obstacles
19. Intensity of the academic content in the textbook and its pressure on the teacher
20. A lack of teachers’ experience in dealing with thinking skills
21. A lack of clarity when dealing with thinking skills
22. Feeling discrepancy between with the textbook’s academic content and thinking skills within the textbook
23. The student’s frustrate for social conditions surrounding
24. The students are feeling boring for teaching method
25. Students’ lack of knowledge of ways of dealing with thinking skills
26. A lack of professional development centers for the development of thinking skills for both student and teacher
27. A lack of opportunities for the professional development of teachers’ thinking skills
28. A lack of good time for training
29. A lack of professional courses for teachers in order to improve dealing with the development of thinking skills
30. Power relations
   30.1. Group pressure on the individual because the enthusiasm
   30.2. An unsafe environment classroom
   30.3. The use of ridicule from some students
31. Some exercises contain in-depth questions
32. The traditional mentality
33. Weaknesses in literacy
34. Pressure of the daily timetable for the teacher
35. Not to deal with the thinking skills as essential part in the school curriculum
36. Different cultural backgrounds of students in one classroom
Appendix 7

The overall themes from analysis of group discussions

Experience:

1. **Attitude towards the thinking skills process:**
   1.1. The students’ attitudes towards thinking skills process

2. **Strategies and techniques for learning thinking skills:**
   2.1. Collaboration
      2.1.1. Students’ views on collaboration: importance and impact
   2.2. Ask or answer high-level questions
   2.3. Using Scaffolding

3. **Students’ application of the thinking skills process:**
   3.1. Matrix Standards

4. **Students’ experience with the textbooks’ exercises:**
   4.1. The students’ views of the exercises: importance and impact
   4.2. Students’ notes on the development and growth of thinking skills within exercises
   4.3. The role of the exercises
      4.3.1. The exercises contain pictures and exercises that support the teacher in his task of developing thinking skills

Influences:

1. **The perception of external influences:**
   1.1. Motivation
      1.1.1. Students’ motivation
         1.1.1.1. The teacher asks questions outside the official school curriculum.

2. **Extra-curricular programmes:**
   2.1. The students’ views of extra-curricular programmes: importance and impact
      2.1.1. Lead to novelty and be able to generality
      2.1.2. Guidance framework
      2.1.3. Skills and capability
      2.1.4. Rise attainment of academic achievement
      2.1.5. Know how to evaluation answer / owning learning
2.2. What is going on during the extra-curricular programmes regarding thinking skills?

3. The teacher’s positive role:
   3.1.1. The teacher’s positive role
   3.1.2. Giving adequate opportunity to students when solving exercises;
   3.1.3. Tolerant, he does not use violence
   3.1.4. Asking questions
   3.1.5. Respect the students
   3.1.6. Space for students to pose questions; openness of teacher to students

4. The relationship between students and teachers: importance and impact

Challenges:

1. Weaknesses in literacy
2. Exercises
   2.1. Difficult to understand the exercise questions
   2.2. A lack of understanding of the exercises
   2.3. A lack of familiarity with the exercises
   2.4. A lack of confidence
   2.5. A lack of time available to solve exercises
   2.6. A lack of group sympathy in the case of collaborative learning
3. Power relations
   3.1. Fear of some students
   3.2. Fear of the teacher
4. Teacher
   4.1. Teacher penalties
   4.2. Teacher as potentially one of the obstacles
   4.3. Nervous teacher
### Appendix 8

**The observation schedule**

Date: /  /2010. Number of group -Case study- : ( ). Context: Thinking skills in .......... Page number ( )

<table>
<thead>
<tr>
<th>Time</th>
<th>Category</th>
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Appendix 9

The overall themes from analysis of classroom observation

Experience:

1. Techniques and strategies for teaching and learning thinking skills:
   1.1. Collaborative
   1.2. Dialogue
   1.3. Asking or answering higher level questions
   1.4. Feedback
   1.5. Competing
   1.6. The use of the language of thinking throughout classroom
   1.7. Using the Scaffolding
   1.8. Giving enough time
   1.9. Using Cueing

2. Attitude towards the thinking skills process:
   2.1. The students’ attitudes towards thinking skills process
   2.2. The teachers’ attitudes towards thinking skills process

3. Students’ application of the thinking skills process:
   3.1. critical thinking
   3.2. Brainstorming
   3.3. produces a links
   3.4. produces a summary "abbreviation"
   3.5. Thinking upside down
   3.6. Comparison
   3.7. Creative thinking
   3.8. justification
   3.9. imagining
   3.10. spotting the difference
   3.11. issuing the verdict
   3.12. decision-making
   3.13. problem solving
   3.14. classification
   3.15. produces a assumptions

4. The role of the curriculum:
   4.1. The curriculum contains pictures and exerciser that it supports the teacher
       in his task to develop thinking skills
   4.2. Exercises
       4.3. The role of the teacher’s own exercises
       4.4. The role of the textbook Exercises
4.4.1. The textbook contains pictures and exercises that it supports the teacher in his task to develop thinking skills

4.5. The role of the textbook Exercises
The textbook contains pictures and exercises that it supports the teacher in his task to develop thinking skills

5. Use of technology to develop thinking skills

Factors:

1. The perception of the external influences:
   1.1. Motivation
       1.1.1. Teacher motivation
           1.1.1.1. Intrinsic motivation
           1.1.1.2. Extrinsic motivation
           1.1.1.2.1. Teacher rewards

2. Social and cultural factors:
   2.1. The social culture

3. A safe classroom environment: importance and impact:
   3.1. Giving students the freedom to asking
   3.2. Equality

4. The role of the teacher:
   4.1. Asking questions
   4.2. Space for students to pose questions; openness of teacher to students
   4.3. Giving enough time
   4.4. The teacher explained a difficult term which arose from one of the student's questions.
   4.5. Develop students' thinking skills
   4.6. Encouraged students to thinking independently
   4.7. Encouraged students to asking or answering higher-level
   4.8. Application of a variety of tools and ways to develop thinking skills;
   4.9. Encouraged students to be thinkers
   4.10. Created his own exercise to develop students' thinking skills
   4.11. Create a balance between the individual style of learning and a collaborative strategy
   4.12. Individual differences
   4.13. Dealing with thinking skills at the same as dealing with the textbook's academic content
   4.14. Positive teachers’ views of his student that every student has a number of thinking skills
5. Extra-curricular programmes:
   5.1.1. Lead to novelty and the ability to generalise
   5.1.2. Guidance framework
   5.1.3. Raise academic achievement
   5.1.4. Know how to evaluate one’s own answer / owning one’s learning

6. The relationship between teachers and students: importance and impact:

7. A good classroom environment:
   7.1. A sensory factors of appropriate classroom environment
      7.1.1. Answering students’ questions
      7.1.2. The student has great colleagues who ask excellent questions
      7.1.3. There are some issues discussed in the classroom which are outside the formal curriculum

Challenges:

- A lack of time:
  - A lack of time available to solve exercises

- Exercises:
  - Not dealing with thinking skills at the same time as dealing with the textbook's academic content.
  - Difficulty understanding the exercise questions.
  - The difficult terminology used in the questions
  - A lack of understanding of some the vocabulary in the exercise questions;
  - A lack of familiarity with the exercises (4 quotations)
  - A lack of giving students an opportunity to solve the exercise
  - The absence of examples and models for solutions within the exercises.
  - Students’ lack of knowledge of ways of dealing with thinking skills
  - Teacher does not explain the exercises

- Power relations:
  - Fear of the teacher
  - Suffering from group pressure
    - Fear of harm from the student
    - A lack of group confidence in the answers of some members.

- A lack of group sympathy in the case of collaborative learning
- A lack of opportunity for dialogue and developing thinking skills
- Weaknesses in literacy
- Use of traditional methods
  - The students' traditional mentality
  - Worked on the level of memorization
- Absent-minded
- Students wasn’t paying attention
- A lack of teachers’ experience in dealing with thinking skills.
- A lack of awareness of the importance of thinking skills into exercises with the textbook.
- The teacher moved exercises quickly
- The teacher’s lack of experience in dealing with thinking skills
- Some exercises contain in-depth questions
- A lack of self confidence
- Continuous assessment system
- Teacher
  - Teacher as potentially one of the obstacles.
- Individual differences.
- A lack of advanced planning for the textbook's exercises.
- The students are feeling boring for teaching method.
- Students’ lack of knowledge of ways of dealing with thinking skills
## Appendix 10

The local Ministry of Education plan of training programmes for the second term, 2009-2010.

<table>
<thead>
<tr>
<th>Title of course</th>
<th>Duration/ hours</th>
<th>Number per term</th>
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<tbody>
<tr>
<td>1. An introduction to thinking skills</td>
<td>6</td>
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<tr>
<td>2. Creative thinking</td>
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<td>3. Integration of thinking skills in teaching</td>
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<td>4</td>
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<tr>
<td>4. CoRT 1</td>
<td>12</td>
<td>1</td>
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<td>5. The development of creative thinking in the young</td>
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</tr>
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<td>6. Brainstorming applications in teaching</td>
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</tr>
<tr>
<td>7. Critical thinking skills</td>
<td>9</td>
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<tr>
<td>8. The development of thinking skills</td>
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<tr>
<td>9. Multiple intelligences in the classroom</td>
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<tr>
<td>10. Creative thinking skills</td>
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<tr>
<td>11. Organizing thinking</td>
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<td>12. CoRT 2</td>
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<tr>
<td>13. Methods of motivating thinking in the classroom</td>
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Table 5.1: Plan of training programmes on thinking skills for the second term, 2009-2010.
### Appendix 11

**Example of observation lesson**

**Date:** 29/3/2010. **Number of group -Case study- : (3).**  
**Context:** Thinking skills in Islamic Education (jurisprudence)  
**Page number:** (1)

<table>
<thead>
<tr>
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<th>Reflection and What I Thinking</th>
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<tr>
<td>8:05</td>
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<td>TR, ATS, C, S&amp;T, II, &amp; EI</td>
<td>T Input  - The teacher had asked several questions from the beginning of the lesson started from it to explain the contact of the textbook (fasting) and (things which invalidate the fast).  -The teacher encouraging his student to thinking and create their question about the subject of lesson and then he some time asking who know the answer of the student's question.  -Most questions can classify underneath thinking skills such &quot;asking justification, critical, imagination and what difference&quot; and some of them regarding 'issues the verdict'.  - Those questions have directly positive effect such I noted that some students' evaluated the question or the answer of their colleague then establish won issues or question;</td>
<td></td>
</tr>
<tr>
<td>8:06</td>
<td></td>
<td>TR, ATS, C, S&amp;T, II, &amp; EI</td>
<td>S Input  -The waves of questions do not subsided whereas it come from students themselves about (fasting) and (things which invalidate the fast).</td>
<td></td>
</tr>
<tr>
<td>8:09</td>
<td></td>
<td>TR, ATS, C, S&amp;T, II, &amp; EI</td>
<td>T Input  -The teacher's principles in his class as he mentioned it more than time which is there is not wrong answer in the class even question. I counts three time some students when their colleague answering or create their own question said to them: No it's wrong, then the teacher said: Oh students I said there does not any wrong answering here, he one time said I said million time there does not wrong answer.  -From this base, the thinking of student did not has some obstacle which I noted in difference case such safety classroom</td>
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<tr>
<td>8:09</td>
<td></td>
<td>TR, ATS, C, S&amp;T, II, &amp; EI</td>
<td>S Input  - One of students assumes the assumption then he asking a very high question, so, the teacher as usual asking students: Who can answer this good question? I counted more then ten times of student's try to answering to their difficult colleague's question, until one of them answering for it.  - The teacher in many cases shows awareness of the importance of giving enough time to students when they dealing with thinking skills.</td>
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335
<table>
<thead>
<tr>
<th>T Input</th>
<th>S Input</th>
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<tbody>
<tr>
<td>The teacher in many time supported the development of thinking skills by encourage his student thinking independently without any link of the textbook that shows through he in many time asking students mention they won definition of some terms without go back and look to the textbook. - The teacher always encourage students thinking to answering the question by stimulate them as he said in many times &quot;beautiful answering but we need more&quot; or sometime he said &quot;grateful, excellent&quot;;</td>
<td>in some question, the teacher when fast students raising their hand to answering the question the teacher saw to them: be patient, gives your colleague chance to answer, give them more time.</td>
</tr>
<tr>
<td>- This style of encouraging student answer have positive effect of student in different aspects, one of them, I noted two student their asking high level question then I focused on them more.</td>
<td>- The teacher shows awareness of the importance of giving enough time to students when they dealing with thinking skills.</td>
</tr>
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### The observation schedule

**Date:** 29/3/2010  
**Number of group -Case study- : (3).**  
**Context:** Thinking skills in Islamic Education (jurisprudence)  
Page number (2)

<table>
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<th>Input</th>
<th>What I Seeing</th>
<th>Reflection and What I Thinking</th>
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</thead>
</table>
| 8:10 | TR, ATS, C, S&T, II, & EI | T Input | -The teacher tried developing thinking skills in different ways one of them, the teacher always encourages students to present a unique definition of a term which related the lesson, and he encourages him to be creator student and he mentioned definitions and meaning of creative  
-Other, the teacher draw schedule contain twice parts, and then asking students make brainstorming related with what he written. | -All those have a positive effective when the students learning thinking skills as well it supports thinking language. |
| 8:15 | TR, ATS, C, S&T, II, & EI | S Input | -Throughout this lesson, I often noticed that the students on whom I was focusing, "Ayyaf, Khaddiri and Mazide", showed more interaction when dealing with thinking skills and they were always asking or answering higher level questions.  
-They sometimes said "it like what we have studied in the enrichment programs".  
- Also, they showed know how to evaluate their colleagues' answers, create their own original answers and sometimes generalise their solutions by asking the teacher. | -Extra-curricular activities had a strong influence on the development of their thinking skills and it may contributed to facilitating students’ learning of thinking skills by giving them more support about the meaning of the thinking skills perspective. |
| 8:16 | TR, ATS, C, S&T, II, & EI | T Input | -The teacher some time assumes some of the assumptions and asking students to solve it, and sometimes asking students to support their answer by evidence. | -In this lesson there was a good classroom environment, and ask or answer high questions had good positive effective when the teacher as well students teaching/learning thinking skills. |
| 8:20 | TR, ATS, C, S&T, II, & EI | S Input | -One of students which I focused on them more when the teacher asking question about the subject of the lesson the student "Ayyaf" derived from the teacher's question, and then he ask a question oppose to the teacher's question, and stated explanation for Why? After the teacher said he replied to his question, but the student | -The importance of giving students the freedom to talk when they are dealing with thinking skills by feeling safe to ask any question, even if it looks like criticism of teacher. |
is not satisfied, and responded to answer the teacher using inverted thinking.

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<td>TR, ATS, C, S&amp;T, II, &amp; EI</td>
<td>T Input</td>
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<tr>
<td>S Input</td>
<td>- Through the teacher dialogue he always asking students to justification and/or presented distinguishes and/or linking whey they make decision and some time asking presented some evidence.</td>
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<td>- All of these means had a positive effect on the students’ learning of thinking skills as well as supporting the language of thinking.</td>
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## The observation schedule

**Date: 29/3/2010. Number of group -Case study- : (3).**  
**Context: Thinking skills in Islamic Education (jurisprudence)   **

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<td>• TR, • ATS, • C, • S&amp;T, • II, &amp; • EI</td>
<td>T Input</td>
<td>-The teacher made linking between one of students’ question with five rules as the principles of jurisprudence to started from it to variety aspects of the development thinking skills such classification, make decision and so on; thus, students starts trying to classify what he knows about the subject of the lesson (fasting) and (things which invalidate the fast) and places it on Islam law by five rules.</td>
<td>- I noted that, the teacher was succeed to established a now understating of assume situation from old rules and then as I noted created numbers of situation linking with the first 'original'.</td>
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<tr>
<td>8:24</td>
<td>• TR, • ATS, • C, • S&amp;T, • II, &amp; • EI</td>
<td>S Input</td>
<td>-Throughout this observations I noticed that, with a friendly relationship, the students felt comfortable when asking questions because of the non-threatening environment.</td>
<td>- A friendly relationship between the student and teacher is important for the increase and improvement of students’ thinking skills.</td>
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<td>8:25</td>
<td>• TR, • ATS, • C, • S&amp;T, • II, &amp; • EI</td>
<td>T Input</td>
<td>-The teacher used cueing and giving a model answer when students were unable to understand what the exercise was asking them to do. This enabled them to proceed.</td>
<td>It seemed to be that the student responded to this cueing as a tool to develop his thinking skills, and it assisted him in successfully completing his task.</td>
</tr>
<tr>
<td>8:30</td>
<td>• TR, • ATS, • C, • S&amp;T, • II, &amp; • EI</td>
<td>S Input</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8:31</td>
<td>• TR, • ATS, • C, • S&amp;T, • II, &amp; • EI</td>
<td>T Input</td>
<td>The teacher talked more than once about the importance of developing students’ thinking skills as this would help them in different aspects of their lives.</td>
<td>-Time pressures were noticed to be a major challenge by a majority of students, having a negative influence on the development of their thinking skills.</td>
</tr>
<tr>
<td>8:32</td>
<td>• TR, • ATS, • C, • S&amp;T, • II, &amp; • EI</td>
<td>S Input</td>
<td>Throughout this observations I noticed that, one of difficulties that faced both the teacher and students. For the teacher, two main challenges were a lack of time and the continuous assessment system</td>
<td></td>
</tr>
</tbody>
</table>
## The observation schedule

Date: 29/ 3 /2010. Number of group -Case study- : (3). Context: Thinking skills in Islamic Education (jurisprudence)  

<table>
<thead>
<tr>
<th>Time</th>
<th>Category</th>
<th>Input</th>
<th>What I Seeing</th>
<th>Reflection and What I Thinking</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:35</td>
<td>T Input</td>
<td>-Throughout this lesson I noticed that the teacher frequently made a link between the socio-culture context and the textbook exerciser by giving examples from the current socio-culture context, aimed at developing his students’ understanding.</td>
<td>-This seemed to be the importance of the student's background in that it had an influential role in supporting children and encouraging them to develop their thinking skills.</td>
<td></td>
</tr>
</tbody>
</table>
| 8:40 | S Input  | -The textbook contains pictures and exerciser that it supports the teacher in his task to develop thinking skills;  
- The student textbook and student activity book contains pictures and exercises that support the teacher in his task to develop thinking skills.  
- Each question was a exercise in the student activity book and each one could be classified as a thinking skill, such as "being critical", "expecting", "imagining", "classifying" and "making links" regarding (fasting) and (things which invalidate the fast).  
- The importance and powerful effect of the infusion approach in the textbook as a source of thinking and its influence on the development of students' thinking skills.  
- The process of thinking skills among the textbook seem to be a construction process in terms of teacher collaborated among himself to the development and completion of the abilities and teaching skills of students using particular educational incubator by adopting infusion approach. | |
<p>| 8:35 | T Input  | -The teacher shows he awareness for the impotence of equality between student when mange the answering process and chose who will be answerer, when he noted some student he do not happy for his chose he justify why he allow to a student to answering rather than other | - The teacher showed awareness of equality between student for the development of students' thinking skills. |</p>
<table>
<thead>
<tr>
<th>EI</th>
<th>S Input</th>
<th>-More than once students showed enjoyment when they were dealing with thinking skills exercises.</th>
</tr>
</thead>
<tbody>
<tr>
<td>TR, ATS, C, S&amp;T, II, &amp; EI</td>
<td>T Input</td>
<td>-The teacher concluded his lesson by provided feedback on the answers of the textbook exercises.</td>
</tr>
<tr>
<td>S Input</td>
<td></td>
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</tbody>
</table>
### Appendix 12: Number of instruments of data collection

<table>
<thead>
<tr>
<th>Month</th>
<th>Week</th>
<th>Number of main interviews</th>
<th>Number of main classroom observations</th>
<th>Number of main group discussions</th>
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</thead>
<tbody>
<tr>
<td></td>
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<td>Teacher interview</td>
<td>Student interviews</td>
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<tr>
<td>Month One</td>
<td>Week One</td>
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<td>2</td>
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<td>Week Two</td>
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<tr>
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<td>Week Three</td>
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<td>2</td>
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</tr>
<tr>
<td></td>
<td>Week Four</td>
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<td>2</td>
<td>3</td>
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<tr>
<td>Month Two</td>
<td>Week One</td>
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<td>2</td>
<td>4</td>
</tr>
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<td>Week Four</td>
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<td>3</td>
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<td>28</td>
<td>38</td>
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