

Science and Mathematics Education Centre

Investigating factors that influence change from a traditional to a socio-constructive teaching paradigm: Teachers' beliefs, alternate conceptions and external factors

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Declaration

This thesis contains no material that has been accepted for the award of any other degree or diploma in any university. To the best of my knowledge and belief, this thesis contains no material previously published by any other person except where due acknowledgement has been made.

A handwritten signature in black ink, appearing to read 'Monika Ann von Oppell', with a long horizontal flourish underneath.

Monika Ann von Oppell

June 16, 2016

Abstract

Education reform, in particular, curriculum reform of the magnitude being implemented in Abu Dhabi at the time of this research, poses a number of questions with respect to implementation, on-going challenges, and future impact for teachers, students and the community. This problem has the potential to be magnified when the implementation involves a cultural context and paradigms of practice that are different from the Western norm. This study focused on identifying teachers' beliefs about their practice and the factors that influence their implementation of the constructivist practices that were demanded by the large-scale education reform being carried out in Abu Dhabi, United Arab Emirates (UAE). In this emirate, Arab teachers had been entrenched in mostly traditional approaches to teaching and were required to shift to a constructivist approach. The study involved a mixed methods approach in which quantitative and qualitative data were collected in two phases. In the first phase, a survey developed for the purpose of this study was used to assess teachers' beliefs ($N=182$ teachers) about their role as a teacher, their philosophy of learning and views about their implementation of the reform. The second phase involved a case study with 15 teachers to examine teacher beliefs more closely and to observe their practice. Lesson observations conducted with each of the case study teachers and semi-structured interviews (held before and after each observation) were used to gather information during this stage. To provide information about the constructivist nature of the classroom environments, a second instrument was used to assess students' perceptions. This instrument was administered to one class of each of the 15 case study teachers ($N=397$ students).

As a first step, evidence to support the reliability and validity of the two surveys (one to assess teachers' beliefs and the other to assess students' perceptions of the constructivist nature of their learning environment) was provided. In both cases, refined versions of the instruments were found to be reliable in terms of their factor structure and internal consistency reliability. This information provided support for the results of the subsequent analysis.

Descriptive statistics were used to provide information about teachers' responses to the survey. These findings indicated overall that the teachers held traditional views of their role and considered learning and knowledge acquisition in traditional ways. In contrast, the teachers felt that their classroom practice, in terms of their choice of pedagogy, use of collaboration and the physical environment of the classroom were in line with the constructivist approach required by the reform efforts.

Simple correlation and multiple regression analysis were used to examine whether students' views of the constructivist-oriented learning environment were related to the teachers' beliefs. These results indicated that overall the relationships were weak. Further, observations carried out in the classrooms of each of the 15 case study teachers corroborated these quantitative findings, indicating that teachers' choice of delivery (pedagogy), use of collaboration and physical environment were not as constructivist as the teachers believed them to be.

Interviews held before and after classroom observations with each of the 15 case study teachers helped to provide reasons for why they were not implementing the requirements of the reform in the majority of cases, even though they believed that they were. Analysis of this qualitative information indicated that there were a number of factors that influenced the teachers' implementation of constructivist practice. Two major categories emerged: those factors that were considered to be within teachers' control (understanding, knowledge and interpretation) and those over which the teacher had no control. For the factors considered to be within the teachers' control, the incongruence between their believed and observed practice was attributed largely to their lack of knowledge of constructivist practice (in particular the role of the teacher, lesson planning and lesson objectives/outcomes), and to misinterpretation of constructivist terminology (such as what constituted learning, activities/tasks, group work and student-centred learning). The factors external to the teacher that affected their implementation of the reform initiatives included: increased workload and time constraints; lack of support from the school administration; lack of readiness of the students to participate in a constructivist setting; and the role of the coaches and mentors who were in place to advise and assist the teachers.

The results of this study are significant in a number of ways. First, the findings provide insights into how teachers' beliefs influence the implementation of reform initiatives, and shed light on the factors that influence their interpretation and implementation of constructivist practice. Second, the study contributes methodologically to the wider field of teachers' role in pedagogy through the development and validation of a survey designed to assess teachers' beliefs. This instrument can be useful for ascertaining teachers' professional development needs and for understanding the beliefs of teachers. Finally, in regions of cross-cultural diversity, the findings may assist in creating understanding of and sensitivity to the cultural differences between people and their knowledge, perspectives and practices during a period of reform.

Dedication

This Thesis is dedicated to

Charles Felix Rheault

Who always urged me to have faith in myself, saying, “Never let fear hold you back”.

Initially, one dismisses the concept, thinking that there is nothing to be afraid of; as fear is usually considered in the context of life threatening incidents. However, the depth of meaning reveals itself when fear starts to govern our actions: we don't speak out for fear of what others may say; we don't confront those hurting us for fear of being outwitted or humiliated; or we don't take on a task for fear of failure. The emotion, associated with the consequences of the actions of others that may be prompted by our own actions, prevents us from acting at all. In this way, we shun embarrassment, humiliation, defeat, reprimand and failure.

Thank you for showing me how to have an extraordinary life.

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Thank you Charles, for your wisdom and knowledge. Thanks too, to our friends Harold J Himmelfab III; Felix Edwards ("But will it work in theory"), The Professor, J Howard and Margaret J Eagan.

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Chapter 1

Introduction

The time of one's life is also intricately connected to the life of one's times. (Hargreaves, 2005. p. 968)

1.1 Introduction

During the past decade the world has witnessed much change in Middle Eastern countries, manifested through political, social and economic developments. In particular, Abu Dhabi, an emirate of the United Arab Emirates, embarked upon programs of development in many areas, including but not restricted to education reform, health reform, police and traffic reform, development of financial institutions and of airports (passenger and cargo). Such reforms have included both physical and social changes and, in many cases, have involved paradigm shifts from a society that, 40 years ago, consisted of fractured tribes living in desert settlements and Bedouin camps to a first world, technologically advanced society (Al Fahim, 2007; Henderson, 1988).

The study reported in this thesis examined teachers' beliefs about their implementation of constructivist practice in the classroom, and the factors that influenced their implementation of the reform requirements. This chapter introduces the research by providing a background and context to the study (in Section 1.2), in which a description of the region in which the study took place is provided. Section 1.3 describes the theoretical framework for the study. Section 1.4 introduces and describes the research objectives, and Section 1.5 summarises the significance of the study (both for the region and globally). Finally, Section 1.6 provides an overview of the thesis.

1.2 Context of the Study

The United Arab Emirates (UAE) came into being through the unification of seven emirates on 2nd December 1972. The UAE is situated on the Arabian Peninsula, bordered to the west by Saudi Arabia and to the east by Oman, with Yemen to the south and the Arabian Sea to the north. The United Arab Emirates are made up of seven emirates, Ras al Khaima, Fujairah, Sharjah, Um al Quwain, Ajman, Dubai and Abu Dhabi. Abu Dhabi, the largest of the emirates, is divided geographically into Abu Dhabi Island and the immediate mainland surround, the eastern section of Abu Dhabi around the old capital and oasis, Al Ain, and the oil rich western region, Al Gharbia.

Abu Dhabi is both the name of the capital city, located on the island Abu Dhabi, as well as the name of this emirate. Abu Dhabi city, developed originally on Abu Dhabi Island, has subsequently spread onto the adjacent mainland. More adjacent islands are being incorporated into the city environs as development continues. Maps of the location of the UAE and make-up of the emirates that form UAE are provided in Appendix 1.

The emirate of Abu Dhabi is divided into three educational zones: Abu Dhabi (the region comprising the city of Abu Dhabi both on and off the island); Al Ain (incorporating the oasis city of Al Ain and surrounding areas, the Eastern Section of Abu Dhabi emirate); and Al Gharbia (incorporating those areas west of Abu Dhabi and Al Ain, known as the Western Region). Although Al Gharbia covers a vast area, there was, at the time of writing this thesis, little human habitation in this region as it was mostly desert. In the past, human settlement was restricted to oasis areas and some coastal areas, however, the development of Al Gharbia is progressing quickly due to the mineral wealth in the region.

In 2014, the census reported that the population of the emirate of Abu Dhabi was 2,657,026 – of whom 1,750,855 were males and 906,171 were females. The vast difference between the number of males and females is due to the high numbers of workers employed from the East, particularly male construction workers. Twenty per

cent of the population consists of Emirates, the majority of whom live in Abu Dhabi city and Al Ain (The National, 2015). The remaining percentage of the population is made up, largely, of: Arabs from Tunisia, Egypt, Jordan, Syria, Iraq and Lebanon; Asians from India, Nepal, Pakistan, Sri Lanka and Bangladesh; Pilipino; and, to a lesser extent, Europeans from USA, UK, South Africa and Australia.

Since its inception, the UAE, in particular the emirates of Dubai and Abu Dhabi, have grown at an astounding rate, as evident in the growth of the physical infrastructure. This growth has been paralleled in many areas including the financial, business, sport, police and traffic, health and tourism sectors. Before the turn of the 21st century, few world travellers had heard of Dubai and even fewer had any knowledge of Abu Dhabi (Al Fahim, 2007; Henderson, 1988; Maitra & Al-Hajji, 2001). Today both emirates are considered to be international air travel hubs. Both Emirates and Etihad airlines have become global contenders for their high standards, efficiency and expanding world destinations. Similarly, the UAE has positioned itself in the forefront of major sporting events, hosting many prestigious and high paying events, including golfing, horseracing, Grand-Prix motor racing, Sevens Rugby, Ultimate Fighting Contests and Red Bull Air Races.

With a focus on large-scale up-skilling and development of various economic sectors with the aim of attaining international status, it was thus only a matter of time before the education sector was seen to be in need of reform. The emirate of Abu Dhabi embarked upon a large-scale education reform of its government schools in the 2007-2008 academic years, with the primary objective of creating world-class standards of education within the emirate. To provide a context for the study, this section provides an overview of the learning culture of the Middle East in general and Abu Dhabi in particular. The section then goes on to describe the education system in Abu Dhabi and reform that has been taking place in the UAE.

1.2.1 Learning Culture of the UAE

Abu Dhabi, like most of the Gulf States and Middle Eastern countries, emanated from a tribal system. This tribal society was set up for the survival and the wellbeing of its

members. The system involved a hierarchical structure that excluded dissension in its decision-making process, putting the onus on the leader to make decisions for the safety and wellbeing of members of the tribe. In return, the tribal members were required to give the leader their unquestioned allegiance (Al Fahim, 2007). In the Middle East, the tribal ruler conducted the affairs of state, dispensed justice and dealt with tribal matters in the *majlis*.¹ “Their [Bedouin] religion and culture dictated that their allegiance must lie with the two beings that would care for and protect them – God above, and the Chief of their tribe here on earth” (Al Fahim, 2007, p. 152). The chiefs had the allegiance of their communities (Al Fahim, 2007; Henderson, 1988) and the people relied on their memory to “preserve them” (Maitra & al Hajji, 2001, p. 2).

Prior to 1971, formal education was largely unknown to Abu Dhabi citizens because of their nomadic and isolated desert existence. “The elders simply passed on what they knew to the next generation” (Al Fahim, 2007, p. 152). Cultural barriers isolated the small groups of Bedouin² and, as travel was arduous, it was undertaken only when necessary. At this time there was no mass communication, in the form of newspapers, radio or TV, resulting in virtual isolation for the majority of Bedouin from the rest of the world (Henderson, 1988).

Although, currently, infrastructure has been created to increase communication and decrease isolation, to a large extent, the tribal system still exists (Al Fahim, 2007). A tribal system is characterised by people belonging to groups or collectives that look after them in exchange for loyalty (Hofstede, 1984). Hofstede’s cultural framework, often used in cross-cultural studies (Orr & Hauser, 2008), further identifies ‘power distance’ and ‘uncertainty avoidance’ as salient aspects of different societies. Tribal systems such as those in the UAE are characterised by a high power distance and low individualism, which results in those in authority rarely, if ever, being publicly criticised (Richardson, 2004). Power distance is defined as “the degree that unequal distributions of power are expected and accepted by communities (Orr & Hauser,

¹ A meeting room

² Traditional nomadic tribes of the Middle East and Arabian peninsula

2008, p. 2). A high power distance, such as the tribal system, “reflects an acceptance of unequal distribution of power without question” (Richardson, 2004, p. 432).

Uncertainty avoidance is the extent to which people “feel threatened by uncertain and unknown situations” (Yoo, Donthu & Lenartowicz, 2011, p. 194), which relates to how “secure a person feels about knowing what to do and when to do it” (Richardson, 2004, p. 432). It had been noted that Arab teachers in Abu Dhabi generally avoid confrontation with those in authority (Richardson, 2004).

Individual growth, as a Western concept, is in stark contrast to the Middle Eastern concept in which the interests and the development of the collective (the community) are emphasised. This Western ideology has the potential to cause disharmony because “knowing one’s place is a pre-requisite for social order” (Richardson, 2004, p. 433). “Cultural values, including those related to power distance, have been reported, in past research, to represent powerful constraints on individual behaviour” (Richardson, 2004, p. 435).

In the late 1990s, the education sector of the UAE came under scrutiny and it was found to have “inappropriate methods of teaching and learning, inflexible curricula and programmes which lead to high dropout rates and long duration of study” (Mograby, 1999 as cited in Clarke & Otaky, 2006, p. 114). At this time, the pedagogy in most Arab schools and universities was based on the traditional transmission mode, emphasising memorisation through rote learning (Rugh, 2002). The learning culture of the Middle East is encapsulated in the following reflection (Nafisi, 2003, p. 220):

The students memorised everything the teachers said and gave it back to them without changing a word. ... They had never learned any better. From the first day they had set foot in elementary school, they had been told to memorize. They had been told that their opinions counted for nothing.

As a result of this scrutiny, the Ministry of Education (MoE), as part of its ‘Vision 2020’, proclaimed radical changes in teaching and learning practices with shifts from

“teaching to learning; teacher to learner; and memorization to creativity, reflection, imagination and innovation” (UAE Ministry of Education and Youth 2000, p. 87). The next section describes the education system in Abu Dhabi and the large scale reform that was underway at the time of writing this thesis.

1.2.2 Education Reform in Abu Dhabi

Sheikh Zayed al Nahyan, the father of the UAE, (henceforth referred to as Sheikh Zayed) had a vision for his people, which is gradually being recognised by the current leaders of the UAE. An essential part of Sheikh Zayed’s vision was that of education: “The best investment of our wealth is in creating cultured and educated citizens. We have to be swift and make our progress in education faster than our progress in any other field” (Al Nahyan, 2013).

The Ministry of Education’s vision is to have:

... an educational system that harmonizes with the best universal educational standards prepares the student for a beneficial and productive life, develops his ability for continuous learning to deal with the era’s facts and to contribute to achieving enduring development for the community. (MoE, 2009, p. 23)

The scale of the reform that was envisaged by Sheikh Zayed was immense, an overhaul of the education system involving, inter-alia: a new curriculum with a change in pedagogical approach; a restructuring of the framework of the education system and education department; a restructuring of the school year including a lengthening of the school day; a new system and process of assessment; an increase in the number of teaching periods for Arab teachers to 24 lessons per week; and a move to school-based decision-making. Such reform involved a paradigm shift in philosophy, thinking, understanding, approach, culture and values by those who were required to adopt the changes and sustain them in order to fulfil Abu Dhabi Vision 2020 (UAE Ministry of Education and Youth, 2000).

Few nations today have undergone reform to such a scale within education sectors in such a short time frame. There has, to date, been limited education research in or of the UAE. The reform taking place offers an opportunity to explore the interplay of the Middle East culture, in particular Abu Dhabi, and the implementation of a largely Western curriculum, which was being overseen, on the whole, by a body of Western expatriates and implemented in the schools largely by expatriate Arab teachers and, more recently, Western teachers.

Prior to the reform, education matters were conducted through the appropriate Ministerial offices of the region, known as the Education Zone (referred to as The Zone). It was from The Zone that instructions were issued, signed and stamped by the head of The Zone in accordance with and following the decrees of the Ministry of Education. In 2005 the Abu Dhabi Education Council (ADEC) was established to implement the education reform initiated by Sheikh Mansour bin Zayed Al Nahyan. The overall objective of the Council was to:

Seek to develop education and educational institutions in the Emirate of Abu Dhabi, implement innovative educational policies, plans and programs that aim to improve education, and support educational institutions and staff to achieve the objectives of national development in accordance with the highest international standards. (ADEC, 2013)

The ADEC mission and vision were articulated as:

ADEC VISION

Education First – recognised as a world-class education system that supports all learners in reaching their full potential to compete in the global market.

ADEC MISSION

To produce world-class learners who embody a strong sense of culture and heritage and are prepared to meet global challenges (ADEC Vision & Mission, 2013).

In light of the Sheikh's vision for a world-class education system, a division of the Department of Education, New South Wales (Australia), was commissioned to write a curriculum specifically for Abu Dhabi, based on the outcomes based curriculum of New South Wales. This new curriculum was announced at a press conference in August 2008 by Hanif Hassan, Minister of Education, stated that the Abu Dhabi Education Council Standards were being adopted because "students will gain academic, practical and technological skills and ... these curriculums took into consideration the students' needs in real life" (Hassan, 2008, p. 3).

Three areas within the Abu Dhabi education system were highlighted as presenting fundamental challenges: the quality of the instruction being delivered, the curriculum and learning environment, and the quality of the physical infrastructure of the schools. As such, the reform program sought to address many aspects of the education system, including the curriculum, pedagogy, physical structure of many schools, assessment and examinations, provision of special needs, library services, higher and vocational education and inspections. Old schools that were not considered to be compliant with the physical infrastructure or facilities required for what was considered to be modern teaching and learning were being replaced with new, purpose built schools.

The reform has involved the use of coaches and mentors working side-by-side with principals, administrators and teachers in a coaching and mentoring model to implement change and build capacity within the schools. Cluster managers (expatriate principals from USA, Canada, Australia, New Zealand, UK and South Africa), have supported the school principals and school administration staff. Education advisers (experienced teachers from a similar set of countries to that of the Cluster Managers), have been used to coach and mentor the teachers and subject faculty heads in pedagogy, curriculum implementation and student behaviour management. Their position is similar to that of an instructional coach in the US context.

Education reform, in particular, curriculum reform of the magnitude being implemented in Abu Dhabi and involving such different cultural contexts and

paradigm shifts poses a number of challenges with respect to implementation. The study reported in this thesis focuses on how middle and high school Arab teachers' beliefs affect their implementation of the expected pedagogy and curriculum reform. In Abu Dhabi, the ADEC government schools provide education for Emiratis and some Arab students. Numerous private schools cater for the various expatriate population groups. In 2013 there were 111 ADEC schools in the Al Ain region, 31 ADEC schools in the Al Gharbia region and 113 ADEC schools in the Abu Dhabi precinct.

The government school structure in Abu Dhabi is referred to as the P-12 system. This system is similar to that of Western schooling, in that the schools range from pre-school, referred to as KG (kindergarten), through to grade 12. Prior to the education reform there was no policy with respect to the age requirements for entrance. Although, when the reform commenced, a decision was made to use a Western age criterion, this policy has only recently been drawn up. Therefore, at the time of writing this thesis, there was a two-year span for each grade. For example, students aged five to eight years could enter grade one. (Note that this accounts for the apparent anomaly in Table 1.1).

Schooling begins at kindergarten (KG) at the age of three to five years. There are two KG years, KG1 and KG2. From KG, students enter grade 1 at five to six years of age and move through to grade 12. The nomenclature used for the different phases of schooling is different in Abu Dhabi to that used by Western education systems. For example, Grades 1 to 5 (which cater for students aged five to 12 years of age) is known as Cycle 1. Grades 6 to 9 (which cater for students from 11 to 16 years of age) are known as Cycle 2, and Grades 10 to 12 (catering for students from 15 to 19 years of age). In the Western context, Cycle 1 is equivalent to primary or junior school phases, Cycle 2 is equivalent to middle school or junior high and Cycle 3 is equivalent to high school. Table 1.1 provides a summary of the year levels, the phases of schooling and age groups associated with each phase.

It is of note that the term 'Common School' is given to schools that may include more than one cycle, such as a combination of Cycle 2 and Cycle 3.

Table 1.1 Grade level, Abu Dhabi Terms and the Ages of the Student

| Grade level | Abu Dhabi term | Ages of students |
|-----------------|----------------|------------------------|
| KG 1; KG 2 | KG 1; KG 2 | 4 to 5 years 11 months |
| Grades 1 to 5 | Cycle 1 | 6 to 12 years |
| Grades 6 to 9 | Cycle 2 | 11 to 16 years |
| Grades 10 to 12 | Cycle 3 | 15 to 19 years |

1.3 Conceptual Framework

The research described in this thesis focuses on teacher beliefs about their implementation of the reform requirements and the factors that influenced the teachers' implementation of these reform initiatives. It has been widely acknowledged that teachers are the most important agents in shaping education for students and in bringing about change and innovation in education practices. Education innovations, however, have often failed because the need for teacher learning and development was not recognised (Lieberman & Pointer-Mace, 2010). It is through teachers' beliefs that the teacher filters, interprets or rejects new information (Nespor, 1985; Pajares, 1992; Van Driel, Bulte, & Verloop, 2007). Research shows that there is a strong relationship between teachers' beliefs and their actions in practice, such as planning, instructional decisions and pedagogy (van Driel et al., 2007). This section provides a conceptual framework that is grounded in current work on teachers' beliefs and related issues. The section starts by providing a working definition of teachers' beliefs for the study. This discussion is followed by an outline of the learning culture of the United Arab Emirates. Finally, this section provides an overview of the concept of organisational change, to provide an understanding of the complexities involved with the reform.

1.3.1 *Teacher Beliefs*

The Oxford dictionary defines *a belief* as “a firm opinion; an acceptance of a fact, statement, etc.” (Metcalf, 2008, p. 80). An *opinion*, on the other hand, is defined as “a belief or assessment based on grounds short of proof; a view held as possible” (Metcalf, 2008, p. 573). *Proof* is defined as the “facts, evidence, argument etc. establishing or helping to establish a fact; a demonstration or act of proving” (Metcalf, 2008, p. 655). These dictionary definitions of ‘belief’ and ‘opinion’ help to clarify the concept of *teacher beliefs*. Given these definitions, teacher beliefs are not proven, scientific facts, but rather, are mental constructions of practice that are developed by individuals through observation, immersion and experience (Kagan, 1990; Luft & Roehrig, 2007; Nespor, 1985; Pajares, 1992; Richardson, 1996; Rokeach, 1968).

Teacher beliefs are the personal constructs that a teacher holds about an individual, a group of people, an event or a behaviour that informs them in their decision-making processes (Fishbein & Ajzen, 1975; Jones & Carter, 2007; Kagan, 1990; Nespor, 1985; Pajares, 1992; Richardson, 1996; Rokeach, 1968). Philosophies, theories, views, perceptions, attitudes, personal theories, opinions, conceptions, values, practical principles, perspectives, and axioms are all words that have been used interchangeably with the term teacher beliefs (Pajares, 1992). For the most part researchers who are conducting research on teacher beliefs “are not concerned with the distinction between beliefs, attitudes, opinions and intentions” (Fishbein & Ajzen, 1972, p. 492) and, for the purpose of this study, the term teacher beliefs will be used when examining the teachers’ perspectives, values and practical principles with respect to teaching in the classroom.

The term *teacher beliefs* has been used to examine a range of beliefs such as (but not restricted to): beliefs about the teacher’s role (Eisenhart, Cuthbert, Shrum & Harding, 1988; Fives & Buehl, 2008; Ogan-Bekiroglu & Akkoc, 2009); teachers’ philosophy of learning and education (Meirink, Meijer, Verloop & Bergen, 2009); teachers’ beliefs about teaching and learning (Alger, 2008; Kleve, 2004; Roehrig & Kruse, 2005); teachers’ own efficacy as teachers (Dellinger, Bobbett, Olivier, & Ellett, 2008;

Quirk et al., 2010); classroom practice (Hallet, 2010; Lee, 2008; Milner et al., 2011; Ogan-Bekiroglu & Akkoc, 2009; Şeker (a), 2011); subject specific content (Luft & Roehrig, 2007; Milner et al., 2011); what constitutes knowledge and how this should be delivered (Roehrig & Kruse, 2005; Taylor, 1990); multi-cultural and egalitarian beliefs (Hachfeld et al., 2011); and instruction (Benjamin, 2003; Chai, 2010; Hachfeld et al., 2011; Hallet, 2010; Ogan-Bekiroglu & Akkoc, 2009; Schroeder et al., 2011; Şeker, 2011; Van Driel, Bulte, & Verloop, 2007). Teachers' beliefs are a complex and multifaceted subject that governs nearly every action that a teacher makes in the classroom (Mitchell, 2005).

As early as 1933 Dewey recognised the important role played by beliefs, describing belief as:

Something beyond itself by which value is tested; it makes an assertion about some matter of fact, some principal or some law [covering] all the matters of which we have no sure knowledge and yet which we are sufficiently confident to act upon. (Dewey, 1933, p. 6)

As personal constructs, beliefs govern many aspects of a teacher's decision making, such as: the role that education plays for the individual; individual variations in academic performance; what the teacher considers as acceptable practice in the classroom; and what the teacher considers to be his role in the classroom (Raths, 2001). Bruner (1996) refers to teacher beliefs as 'folk pedagogy' that reflect "wired-in human tendencies and deeply ingrained beliefs" (Bruner, 1996, p. 46). The formation of these beliefs relies "more heavily on affective and evaluative components than knowledge systems" (Abelson, 1979, p. 358). Beliefs, according to Nespor (1985, p. 13), operate "independently of other forms of cognition typically associated with knowledge systems." Consequently, beliefs are not necessarily logical and neither are any two people likely to hold exactly the same beliefs. There is no common source for these beliefs, as they are said to be "a product of their upbringing, a reflection of their life experiences, or a result of socialisation processes in schools" (Raths, 2001, p. 2).

Nespor (1985) refers to critical episodes in a person's life, such as an experience or an influential teacher (that served as both inspiration and as a template for teaching experience) as being the foundation for many teacher beliefs. These episodes often entail assumptions, feelings and personal evaluations that may not have been examined critically by the person in the way that knowledge and facts may be examined. As such, there are no clear logical rules for determining the relevance of beliefs to real-world events and situations. Gardner (2000) emphasises the importance of emotions in human learning and actions, reminding us that "emotions serve as an early warning system" for survival (Gardner, 2000, p. 77). In the case of teachers, this system "signals topics and experiences that students find pleasurable to engage in, as well as those that may be troubling, mystifying, or off-putting" (Gardner, 2000, p. 77). These emotional experiences contribute to a teacher's repertoire of beliefs.

Beliefs cannot be observed or measured but may be inferred from what people say or do, because beliefs are likely to determine an individual's attitude and subsequent behaviour (Pajares, 1992). That is, experiences form perceptions and expectations, which create attitudes that largely, dictate the behaviour that will follow (de Bono, personal communication, August, 2000). For example, if a teacher perceives a student, as having no ability and that there is nothing to be done but to minimise the disruption to the lesson caused by this student, then this teacher's belief will govern their behaviour towards the student. In such a case, it would not be surprising to see the student being isolated and doing meaningless tasks to keep him/her busy.

Knowledge, in contrast to beliefs, is viewed as being unemotional and consists, for the most part, of indisputable facts that can be proved. Unlike beliefs, knowledge is semantically stored information that has been "broken down into logical constituents and organized in terms of lists or networks" (Nespor, 1985, p. 15). Many people can hold the same knowledge without variation. For example, 'C' is the chemical symbol for Carbon or Abu Dhabi is an island. Beliefs, on the other hand, may differ depending upon the context. For example, a teacher may believe that science is a body of knowledge consisting of facts which need to be memorised, while a language may be viewed to be a subject involving critical thinking that requires a different pedagogy (Fives & Buehl, 2008).

According to Pajares (1992), although knowledge of a domain is different from feelings about that domain, it is sometimes difficult to know where knowledge ends and belief begins, especially with reference to a teacher's personal knowledge. Teachers' personal knowledge, defined as experiential knowledge by Clandinin and Connelly (1987), may be blurred by factual knowledge and a teacher's beliefs, because experience involves the emotions (Pajares, 1992). In recent years the role of emotions in human learning has become accepted, with "cognitivists proposing various models of how emotions structure, guide, and influence mental representations" (Gardner, 2000, p. 77).

It is through the brain's spatial memory that experiences are imprinted and embedded, having first gone through the emotional centre of the brain (Howard & Fogarty, 2004). The emotions, referred to as "the gatekeeper to the intellect", create positive or negative responses for the individual (Howard & Fogarty, 2004, p. 26). The brain, constantly observing and absorbing experiences, is a pattern-making organ, matching, categorising and sorting the data according to existing understanding, knowledge and experiences governed by non-linear dynamical laws (Howard & Fogarty, 2004; Kelso, 1997). This process is both conscious and unconscious (Caine & Caine, 1991; Howard & Fogarty, 2004) where the experiences are stored as episodic memory, having been formed through the emotions from "personal experience, cultural belief systems (folklore) or political doctrines (propaganda)" (Schank & Abelson, 1977, p. 17). As such, these episodes colour how an individual comprehends events and creates beliefs. It follows, therefore, that a variety of critical episodes within an individual's life would evoke strong emotional memories that are retained, influencing an individual's beliefs while "experiences devoid of emotional impact are likely to be weakly engaging and soon forgotten, leaving nary a mental representation behind" (Gardner, 2000, p. 77).

Many of the experiences that shape teachers' beliefs (experiential knowledge) occurred while they themselves were going through their own schooling (Lortie, 1975). During these formative years, students who may choose teaching as a profession after 12 to 20 years' exposure in the classroom are probably not made

consciously aware of the teaching practices that they were witnessing, experiencing and absorbing. However, each student's brain continuously makes meaning of these experiences and "sometimes, with confusing bits of information, it creates inaccurate connections or misconceptions" (Howard & Fogarty, 2004, p. 35). By the time that a teacher leaves university, he or she has been exposed to approximately 22,000 hours of classroom teaching (Fraser, 2007), providing opportunities for a considerable number of teaching and learning experiences forming strong and important teaching and learning beliefs within an individual. These personal beliefs may thus not be logical, are not proven against facts, have strong links with feelings and do "not require general or group consensus regarding their validity or appropriateness" (Pajares, 1992, p. 311). They are, however, very real for each individual.

Derived beliefs are beliefs that are learned from others and are not as strong as beliefs that are closely linked to a personal value system, that is, the sense of self. The un-derived beliefs are created through personal experience and are strongly associated with the ego (Rokeach, 1968), which results in these beliefs being more firmly entrenched within the individual than would be a derived belief. Beliefs tend to be static and resistant to change and those beliefs that are more closely linked to ego – sense of self – are more resistant to change (Rokeach, 1968). Therefore, beliefs that touch on the core of the individual's sense of self (the ego) and identity are more difficult to change than the learned behaviours (derived beliefs) that do not touch an individual's core values or identity.

The beliefs that teachers hold about education have been found to influence the implementation of education reform initiatives (Lortie, 1975; Nespore, 1985; Pajares, 1992; Roehrig & Kruse, 2005; Van Driel et al., 2007) and, according to Eisenhart et al., (1988) and Mitchel (2005) reform has little chance of success without the supporting beliefs of teachers, because teachers' beliefs govern nearly all actions they take in preparing their lessons and in the classroom.

In the context of curriculum change and reform, teacher learning is not a simple matter of *learning* and replicating a set of new content and pedagogical strategies, but involves and implies mastering new teaching methods; specifically, in the case of

Abu Dhabi, constructivist teaching methods. This order of teacher learning will involve teachers having to change their beliefs “about their ability to learn and to teach in new ways” (Wheatley, 2005, p. 750). A successful education reform, it is believed, can only be successful when the teachers’ beliefs are taken into account, for it is they who are involved in effecting the reform, thus an understanding of the content and the structure of teachers’ beliefs may contribute to the success of curriculum innovation projects (Clarke & Peterson, 1986; Duffy & Aikenhead, 1992; Tobin & McRobbie, 1996; Van Driel et al., 2007).

1.3.2 Change at the Organisational Level.

Schools, while often referred to as ‘the education sector’ are also organisations and, as such, the research findings of organisational change are applicable. Implementing changes on an organisation level involves much new learning by those who have to actualise the reforms. According to Zell (2003, p. 74), the success and sustainability of such a task can only occur when “professionals themselves agree to undergo change” (Zell, 2003, p. 74) and, thereby, let go of the old and fully adopt the new.

Organisational change models developed by Fullan (2003, 2006), Eaker, Dufour and Dufour, (2002) and Crowther, Ferguson & Hann (2008) list strategies to be used to manage the change, including diagnosing problem areas, identifying strategies to be used and implementing these to move the organisation. Kotter and Schlesinger (1979) note that communication, training, negotiation and coercion are common strategies applied to individuals to effect change with “the idea that if one strategy fails, one simply ups the ante to the next strategy until one works” (Zell, 2003, p. 74). The weakness of such approaches is that they show little or no understanding “of how individuals and groups actually work through their resistance to change” which, according to Zell, (2003, p. 73), is a key determinant of whether change occurs within a professional bureaucracy.

Zell’s research indicates that working through the resistance to change strongly parallels, in both the organisation and in individuals, the stages of grieving associated with death and dying as identified by Kubler-Ross (1969). She identified five stages

that individuals progress through before reaching a state of acceptance, these being: denial (at which stage people deny that it is happening to them and pretend that nothing has or is going to change); anger (at which stage deep emotions of rage, frustration and resentment are expressed and individuals may lash out at others); bargaining and negotiating (at which stage the individual acknowledges the change but tries to negotiate more time); depression (at which stage the individual is depressed, feels dejected and may mourn things and relationships that are already, and may in the future, be lost); and finally acceptance (at which stage the individual experiences a period of inner and outer peace as they accept and no longer fight the inevitable).

Professionals have “invested huge amounts of time and resources into their careers and are guided by entrenched beliefs and values established during years of indoctrination and training” (Zell, 2003, p. 74). Change, and in particular one that is mandated, also triggers powerful feelings of shock, frustration, anger, helplessness, confusion, angst and depression. These reactions are often lumped together and described as ‘resistance to change’, which, when they are not overcome, may be why change in professional bureaucracies is often described as slow, messy, chaotic and often unsuccessful (Cohen, March, & Olsen, 1972; Greene, 2000; Lindblom, 1959; Rowley, Lujan, & Dolence, 1997; Wilms, Schmidt, & Norman, 2000; Wilson, 1989; Zell, 2003). Given these findings, it may not be reasonable to accept that teachers will easily let go of their known practices and accept and adopt unknown beliefs and practices that are strongly underpinned, in the case of Abu Dhabi, by Western beliefs, philosophy, rationale and culture, without some resistance. According to Zell (2003, p. 88), the journey to acceptance will progress through a grieving process because a “part of them is dying and this needs to be mourned”.

1.4 Research Objectives

The overarching aim of the research was to examine Arab teachers’ beliefs and to ascertain factors that influenced their implementation of the reform initiatives. The specific research objectives guiding this study are provided below.

First, given that there was no suitable survey to assess teachers' beliefs, it was necessary to design and develop one for the purpose of this study. Therefore the first research objective was to:

Research Objective 1:

Develop and validate an instrument to assess teachers' beliefs about teaching and their role as the teacher.

Next, to provide an indication of the extent to which teachers were implementing practices expected in the reform, students' perceptions of the constructivist-oriented practices that were taking place were examined. The instrument used to examine students' perceptions was originally developed in the West and was, for the purpose of this study, modified for use in Abu Dhabi. Given that this instrument had not been used in the Middle East before, it was important to provide evidence to support the reliability and its use with high school students in Abu Dhabi. Therefore, the second research objective was to:

Research Objective 2:

Modify, translate and validate an instrument to assess students' perceptions of their learning environment.

A major focus of this study was the examination of teachers' beliefs and the role these played in the teachers' roles and classroom practice; thus the third and fourth research objectives examined the teacher's beliefs and their classroom practice and the factors influencing teachers in implementing constructivist practices into classroom practice. These objectives were to:

Research Objective 3:

Describe teachers' views of their implementation of constructivist practices.

Research Objective 4:

Examine whether a relationship exists between teachers' beliefs about teaching and their classroom practice.

Finally, the study sought to examine the factors that influenced the teachers in their implementation of the reform initiatives. Therefore, the fifth and sixth research questions were:

Research Objective 5:

To determine any incongruence between teachers' views of their implementation of constructivist practices and their classroom practice.

Research Objective 6:

To examine the factors external to the teacher that influence the implementation of constructivist practice.

1.5 Significance of the Study

Outside of Abu Dhabi, there are few places where the opportunity exists to examine aspects of reform on such a large scale (involving an entire education system). Equivalent changes in the Western context have been relatively slow and incremental and have tended to be restricted to individual teachers, specific subject areas, a few schools or education zones/districts. None have involved an entire country implementing such radical change over all subject areas from Kindergarten to year 12 in such a short time frame. Given the dearth of literature related to reform in the Middle East, the results of this study are likely to be of value to a range of stakeholders.

The results of my study provide insights into how teachers' beliefs influence their implementation of constructivist pedagogical practices. As such, the findings of this study are likely to be of interest to government policy makers and a range of professional development providers working in Abu Dhabi.

The results also shed light on factors that influence teachers in their implementation of reform initiatives involving pedagogical change. As such, the results are likely to

be of value to reform initiators and professional development providers worldwide. Further, the implications of these findings are likely to inform authorities of measures that may be taken to limit the influence of these factors and to create an understanding of the significance of teachers' belief systems as an obstacle to reform success.

Methodologically, my study contributes to the wider field of teachers' beliefs through the development and validation of an instrument to ascertain teachers' beliefs, specifically with respect to their classroom practice. The new survey may prove to be a useful tool for future research and for others wishing to examine professional development needs.

The findings of this study have the potential to contribute to an understanding of the beliefs and classroom challenges facing the people who are teaching the students. Through more informed understanding of the beliefs and challenges, suitable professional development, coaching and mentoring may be tailored and delivered to the individual teachers to ensure sustainable practice in line with the reforms being mandated. Furthermore, in regions of cross-cultural diversity, the findings of this research may assist in creating greater understanding of and sensitivity towards the cultural differences between people, their knowledge, perspectives and practices. The instrument could also be used to assist in the development of appropriate teacher training programmes both within Abu Dhabi and internationally.

1.6 Overview of the Thesis

This thesis consists of six chapters. Chapter 1 introduces the study by describing the context of the research. The chapter provides background information for the reform process taking place in the UAE. Definitions, descriptions and the significance of teacher beliefs are provided. The research questions are outlined and the significance of the study explained.

Chapter 2 provides a review of the literature pertinent to the present study. The chapter reviews literature related to epistemological beliefs and their role in

determining a teacher's pedagogical approach and role in the classroom. The chapter goes on to review literature related to teacher beliefs with respect to reform in the West, Middle East, Asia and South Africa. The chapter goes on to provide a description of the pedagogical differences between the traditional and constructivist philosophies of education. Reviews of past curriculum reform initiatives follows, with specific reference to the challenges facing teachers. Finally, given that the study involved students' perceptions of the learning environment, the chapter reviews literature pertinent to the field of learning environments research.

Chapter 3 outlines the research methods used in the current study. The chapter starts with a description of the research processes and methodology, then goes on to explain the research design, including the sample of the study, the development of the new survey, methods of data collection and analysis of data. The chapter also addresses the internal and external validity of the research.

The results of the study are presented in two chapters. Chapter 4 provides evidence for the reliability and validity of the surveys, including the factor structure, internal consistency reliability and discriminant validity. Chapter 5 reports the findings related to investigation of the extent to which teachers' beliefs about teaching were reflected in their classroom practice, and a determination of the factors that influence teachers in transferring their beliefs into classroom practice.

Chapter 6 discusses the results derived from the data by comparing the current findings to the extant research literature on teacher beliefs and curriculum reform. This chapter concludes the thesis by summarising the current study, considering limitations of the study, highlighting the implications and suggesting future research directions.

Chapter 2

Literature Review

All words begin as servants, eager to oblige and assume whatever function may be assigned to them, but that accomplished, they become masters, imposing the will of their predefined intention and dominating the essence of human discourse. (Pajares, 1992, p. 308)

2.1 Introduction

The education reform that was taking place in Abu Dhabi at the time of writing this thesis required that teachers change both their pedagogical practice and their role in the classroom from one paradigm to a very different one. The teachers, who previously had taught using a traditional, transmission-based pedagogical approach, were expected to adopt a socio-constructivist, student-centred one. The overarching aim of this study was to examine, within the context of a large-scale education reform, teachers' beliefs about their role in the classroom and how these beliefs influenced their classroom practice. If, as suggested by Fishbein and Ajzen (1972), beliefs determine attitude, then one can assume that the teachers' beliefs would need to change to effect the required changes in their practice.

This chapter reviews literature pertinent to the present study. Section 2.2 reviews literature related to understanding teacher beliefs and existing empirical research, in particular that pertaining to reform. Given that this study involved examining teachers' beliefs at a time when they were expected, as part of the education reform taking place, to make a paradigm shift from a traditional pedagogy to a constructivist pedagogy, Section 2.3 reviews literature related to these different paradigms. The study also involved examining students' perceptions of the learning environment, to provide an indication of whether the teacher was implementing practices that were more constructivist oriented; therefore a review of this field is provided in Section 2.4.

2.2 Understanding Teacher Beliefs

Whereas Chapter 1 reviewed literature related to teachers' beliefs to provide a working definition for this study, this chapter reviews the literature on the concept of 'teacher beliefs' and their impact on education and curriculum reform.

This section reviews the literature related to teachers' beliefs in two sections. The first, Section 2.3.1, describes teachers' epistemological and pedagogical beliefs and the effect that these have on classroom practice. Section 2.3.2 provides a review of literature related to education reform initiatives with a focus on changing teachers' beliefs and/or practice. This section also reviews studies involving large-scale education reform with a similar paradigm shift in approach to that of Abu Dhabi (such as those carried out in the Middle East, Asia and South Africa).

2.2.1 Influence of Epistemological and Pedagogical Beliefs on Practice

Epistemological beliefs are the beliefs that teachers hold about the nature of knowledge and knowing and how knowledge is constructed, justified and stored (Fives & Buehl, 2008; Hofer & Pintrich, 1997; Nespor, 1985). Kagan (1990, p. 423) described these beliefs as "the highly personal ways in which a teacher understands classrooms, students, the nature of learning, the teacher's role in the classroom and the goals of education". These epistemological beliefs inform and influence teachers' pedagogical beliefs and the way that teachers act in professional contexts (Ruitenbergh, 2011; Splitter, 2010).

Teachers' epistemological beliefs, according to Shulman (1986), extend beyond the realm of the content knowledge that is taught. He identified seven areas that make up a teacher's knowledge base: general knowledge; general pedagogical knowledge; curriculum knowledge; pedagogical content knowledge; knowledge of students and their characteristics; knowledge of educational contexts; and knowledge of educational ends, purposes, values, and their philosophical and historical roots. The interplay of the beliefs within each of these areas, he maintains, will determine the teacher's actions in the classroom.

Pedagogical beliefs, on the other hand, refer to teachers' preferred way of teaching and have been found to predict the practices used by a teacher and the way that the classroom is organised. For example, if a teacher's belief is to "faithfully reproduce the 'real' curriculum with little concern for adaptations to local circumstances", then teachers' classrooms are likely to be characterised by a 'managerialist' style in which the concern of the teacher is in delivering the syllabus and controlling student interactions (Taylor, 1990, p. 6). If a teacher holds strong innate beliefs that a student's success or failure is seen as predictable due to their genetics and is not dependent on the quality of teaching, and where teachers view knowledge as "a prescribed set of facts and algorithms to be transmitted by the teacher and memorised by the students" (Roehrig & Kruse, 2005, p. 413), the traditional model will become the focus for instruction (Chai, 2010; Clarke & Peterson, 1986).

Teachers' pedagogical beliefs have been found to range from those associated with the traditional philosophy of teaching to beliefs associated with a constructivist philosophy of teaching. For example, Chai (2010) found that when teachers believe that knowledge is transmittable and that learning requires effort such as repetitive drills, they favour traditional pedagogical practice. However, it was found that when teachers embraced more constructivist beliefs, their classroom pedagogy did not reflect this (Chai, 2010; Chan & Elliott, 2004; Richardson, 2003). These findings were supported by the findings of other studies carried out in Turkey (Şeker, 2011), Norway (Kleve, 2004) and the Netherlands (Meirink et al., 2009).

Regardless of how beliefs are formed, there is consensus that a person's beliefs will impact on his or her attitudes and behaviour (Fishbein and Ajzen, 1972). For example, the way in which a person defines their job, which stems from their beliefs, will largely determine the way in which they do the job (Druker, 1992). It follows then, that beliefs will form a "repertoire of explanations or goals which could be invoked to justify a particular course or action" (Nespor, 1985, p. 154). In terms of classroom teaching, according to Nespor (1985), it is the repertoire of beliefs that allows the teacher to respond quickly to the many situations to which he/she must act. Thus beliefs become a primary source for action in classroom practice (Morris, 1998; Pajares, 1992; Shinde & Karekatti, 2012).

Teachers will fall back into old patterns in order to survive in the classroom, because they can be overwhelmed with procedural issues and classroom management. Teaching involves many quick decisions and a reliance on impulses and intuition due to the large variety of personal contacts a teacher makes every day. This allows for little time for reflection before action and so becomes a direct manifestation of personal belief systems. (Mitchell, 2005, p. 29)

Further, these beliefs affect what teachers regard as priorities with respect to goal achievement (thereby influencing their classroom practice) (Chai, 2010). For example, Wallace and Priestley (2011) found that, if a teacher believed that students needed to be told the correct information, then this belief was likely to disrupt the teacher's efforts to promote critical thinking in the classroom, as teachers in this situation reverted to a traditional instructional mode.

All teachers, according to Mitchell (2005), operate using a personal theory of teaching, or a set of beliefs about how a subject is learned and how it should be taught. This personal theory may be a conscious or an unconscious choice and could be based on research or reflection (Patrick & Pintrich, 2001). Either way, it is the beliefs generated through this personal theory that drive the teacher's behaviour in the classroom, including their instructional choices and actions, classroom management practices, and how the teacher translates the curriculum (Eisenhart et al., 1988; Fenstermacher, 1979; Luft & Roehrig, 2007; Önen, 2011; Pajares, 1992; Shinde & Karekatti, 2012; Shulman, 1974; Splitter, 2010). It is these personal areas of teachers' practice that are affected and need to change during education reform.

Student teachers, unlike students in other professions, come into their training with beliefs and ideas about how to teach. Their minds "are no *tabula rasa*, no blank slates, but, rather, etched deeply with years of first-hand past experiences of schooling (Buchman, 1991, p. 288). Past research has found this experience to be problematic, as it "is a powerful socialising agent, which 'washes-out' the effects of training" (Calderhead & Robson, 1991, p. 2). Rath (2001) cites autobiographies in

which teachers recount their first awareness of wanting to become a teacher, reporting that it is interesting to note how many of the teachers speak of ‘loving to teach’ at the age of six. One story, that is a reflection of many, in which the teacher acknowledged learning to teach in this manner, is provided below:

When I returned home from first grade, I would go to my bedroom and line up all my dolls as pupils. Then I would teach them a lesson. I loved being a teacher and it was especially enjoyable because my dolls were well behaved. (Raths, 2001, p. 2)

This story highlights the deeply held and rehearsed beliefs that teachers create about their ability to teach. Further, these rehearsals are often formed from their early years of schooling, where teaching strategies and objectives are more focused on the development of recall and memorisation, such as, spelling, learning colours and learning the alphabet. It is only in later years (11 to 12 years of age), when the brain begins to mature, that teaching strategies change (or should change) to develop complex reasoning using the frontal quadrant of the brain (Jensen, 1996). These personal beliefs formed early in a teacher’s personal experience are found to be particularly powerful and resistant to change (Mitchell, 2005). Beliefs may “remain latent during formal training in pedagogy at university but become a major force once the candidate is in his or her own classroom” (Raths, 2001, p. 2) because many students believe that they already know what there is to know about teaching and these beliefs then govern their behaviour.

Although beyond the scope of the present study, it is interesting to note that past research suggests that younger teachers (beginning and early career) are more flexible and have greater tendencies towards changing their pedagogical practice than older (late career) teachers (Şeker, 2011). Alger (2009), in a study analysing teachers’ use of metaphors to describe their practice, reports that the experienced teachers began their careers with traditional metaphors but over the course of their careers some moved towards student-centred metaphors. Newer teachers tended to begin with and aspire to student-centred metaphors, however their “current teaching may not mirror student-centeredness” (Alger, 2009, p. 750).

The research reported in this thesis extended past literature by examining how teachers' beliefs about their role in the classroom impacted on their translation of constructivist practices during a time of education reform.

2.2.2 Teacher Beliefs and Educational Reform

Past research indicates that, in many cases, teachers have had limited success in redesigning curriculum materials to become more constructivist in their approach (see for example Roehrig & Kruse, 2005). Reports indicate that teachers have tended to dilute the intentions of the reform, change the activities to match their familiar traditional objectives, and, while small changes might be observed in classroom practice, their practice often remains strongly influenced by traditional beliefs and practice. It is also reported, however, that if teachers experienced or expected positive outcomes from using a new teaching method, they tended to be more motivated to continue to use the strategies (Wheatley, 2005). Snider and Roehl (2007) reported that teachers were atheoretical and inconsistent in their beliefs and practice, often being guided by what they felt was pragmatic, by their experience and what was popular. Meirink et al., (2009) found that teachers whose beliefs were somewhat congruent with the reform were more likely to familiarise themselves with the teaching methods, reflect on their own teaching and change their beliefs through positive exposure and experience. Conversely, those teachers who were dissatisfied with the reform tended to use more traditional teaching. Teachers who reported intentions to change were, by and large, unlikely to do so, nor did they change their beliefs about teaching, while those who had reported new insights might be more disposed to change their beliefs.

This section reviews literature related to teachers' beliefs and how these might impact on education reform. The section begins with a historical overview of research in teachers' beliefs carried out in different areas of reform around the world (Section 2.2.2.1). The section then goes on to review literature related to the factors that influence teachers' ability to change (Section 2.2.2.2).

2.2.2.1 An historical overview

Of particular relevance to my study was literature that examined teachers' beliefs and changing classroom practice during periods of education reform. Research related to teacher beliefs began during the late 1980s and early 1990s, mainly in Western countries, including the US (Alger, 2009; Fives & Buehl, 2008; Luft & Roehrig, 2007), Canada, (Eisenhart et. al., 1988; Hargreaves & Fullan, 1998). More recently, research was carried out in European countries, such as Norway (Kleve, 2004) and the Netherlands (Hoekstra, Brekelmans, Beijaard, & Korthagen, 2009, 2011; Meirink et al., 2008; Van Driel, Beijaard, & Verloop, 2001; 2007; Vermunt & Endedijk, 2011), and in Australia (Bentley, 2009; Jorgenson, Grootenboer, Niesche & Lerman, 2010).

Research related to teachers' beliefs and how these beliefs influence classroom practice and change gained momentum as district policies, curriculum departments and school administrations encouraged more constructivist pedagogical practices in classrooms. On the whole, these reform efforts were confined to school districts and, in most cases, to specific curriculum areas. For example, in The Netherlands, the change to more constructivist pedagogies took place in chemistry (Meirink et al., 2008; Vermunt et al., 2011). In Norway this was confined to mathematics (Kleve, 2004), and in the US it was confined to science (Luft & Roehrig, 2007).

As innovation and change in these countries where there was a gradual introduction and implementation of constructivist philosophy became increasingly popular, research related to larger school reform programs and processes commenced (Crowther, 1997; Eaker, Dufour, & Dufour, 2002; Fullan & Ballew, 2001; Hargreaves & Shirley, 2009). This research involved school-based programs or district-wide programs mainly in the USA, Canada and the UK. The objective of many of these programs was to improve student numeracy and literacy results and to close the gap between high and low achieving students. Many of these reform initiatives were focused on primary schools and pre-service teachers, and reflected a curriculum change from a text-based approach (acquiring facts and knowledge) to the more favoured outcomes- and standards-based approach (learning of skills, using and

transferring knowledge, and creating own knowledge and meaning through constructivist meaning-making) (Davis & Sumara, 2003; Fives & Buehl, 2008; Hallet, 2010; Dunn & Rakes, 2011; Milner et al., 2011; Schroeder et al., 2011; Wallace & Priestley, 2011).

Research also started to focus on ascertaining teachers' beliefs about various aspects of the profession such as beliefs about their work activities and policy implications (Eisenhart et al., 1988), beliefs and practice (Luft & Roehrig, 2007; Jorgensen et al., 2010; Milner et al., 2011), pedagogical beliefs (Hallet, 2010), self-efficacy beliefs (Dellinger et al. 2008), beliefs about teaching and learning (Schroeder et al. 2011), pre-service teachers' beliefs of traditional and constructivist teaching (Benjamin, 2003; Ogan-Bekiroglu & Akkoc, 2009; Şeker, 2011), multicultural and egalitarian beliefs (Hachfeld et al., 2011), subject oriented beliefs (Meirink et al., 2009) and beliefs and knowledge in the adoption of reform-based curriculum (Roehrig & Kruse, 2005). Apart from the research emanating from The Netherlands (Van Driel et al., 2007, Meirink et al., 2009; Bakkenes et al., 2010; Vermunt & Endedijk, 2011), the research carried out in these countries rarely focused specifically on the teachers' beliefs in terms of education reform and pedagogical change.

As reform and innovation related to constructivism and outcome focused education gained momentum in the West, other countries and regions began to look to how these changes might be useful for their own education systems. These countries, looking to the West, all experienced mandated curriculum reform that was based on what were viewed as the modern methods practised in Western countries (often referred to as Outcomes Based Education, Rheault, personal communication, April 2010). Examples of these whole-country reform efforts included Singapore (Lim & Chan, 2007), Thailand (de Segovia & Hardison, 2009), Norway (Kleve, 2004), Taiwan (Tsai, 2002), South Africa (Bloch, 2006; Grosser & Lombard, 2008), Netherlands (van Driel et al., 2007; Meirink et al., 2009) and later in China (He et al., 2011; Wang, 2011), Turkey (Kirkgöz, 2008; Önen, 2011; Ozkal, Tekkays, Çakiroglu & Sungur, 2009; Şeker, 2011), Libya (Orafi & Borg, 2009), Palestine (Hashweh, 2004) and Jordan (Alkhaldeh, 2010).

These countries, summarised in Table 2.2, all experienced mandated curriculum reform for the whole education system, involving an immediate implementation of a new constructivist curriculum and associated pedagogy that involved a paradigm shift for the teachers of these countries. Teachers were expected to make a “shift from being classroom instructors delivering a top-down curriculum to facilitators of student-centred knowledge networks” (Monkman & Baird, 2002, p. 504). This new constructivist pedagogy, for many teachers, required a profound change in their teaching practice (Hoekstra et al., 2009; Hoekstra & Korthagen, 2011). For reform to be effective, teachers would need understandings of educational philosophies and principles as well as mastering new skills for behaviour management, designing meaningful lesson activities in line with outcomes they would plan, and assessing students’ learning (Bakkenes, Vermunt & Wubbles, 2010; Hoekstra et al., 2009; Hoekstra & Korthagen, 2011; Kleve, 2004; Şeker (a), 2011; Vermunt & Endedijk,

Table 2.1 Summary of regions of education reform researched for teacher belief research

| Area | Region | Area of reform | Research dates | Countries involved | Rate of change |
|------|--------------|--|----------------|--|--|
| 1 | The West | School, subject curriculum domain, district wide | 1988+ | USA, Canada, UK, Norway, The Netherlands, Scotland | Slow, incremental change |
| 2 | East Asia | Whole Education System Reform, countrywide. Paradigm change. | 2004+ | Papua New Guinea, Indonesia, Thailand, Singapore, Rural China, Taiwan, India | Immediate implementation of new curriculum based on constructivist principles replacing traditional curriculum |
| | South Africa | | 2001+ | | |
| | Middle East | | 2002+ | UAE, Palestine, Libya, Turkey, Jordan | |

It is interesting to note that teachers’ observable practice in most Western countries did not show a marked shift towards the desired constructivist-related pedagogy (Kleve, 2004). For example, curriculum reform in The Netherlands showed that, even where teachers had engaged in informal learning activities, the majority of teachers did not show observable change in their teaching practices, although it was reported that their intentions for practice were positive (Bakkenes et al., 2010; Hoekstra & Korthagen, 2011). In Norway, teachers were reported as liking the curriculum but

were not implementing it as it had been intended (Kleve, 2004). Williams and Baxter (1996) and Prawat (1992) observed similar findings, where teachers were reported as showing a willingness to conform to the reforms, but failed to implement the reform intentions, reverting to traditional, old practices.

The research related to teachers' beliefs that has emanated from countries in which system wide reform has been required has studied teacher change with respect to the mandated education reform (de Seqovia & Hardisan, 2009 [Thailand]; Ogan-Bekiroglu & Akkoç, 2009 [Turkey]; Orafi & Borg, 2008, [Libya]; Önen, 2011 [Turkey]; Şeker, 2011 [Turkey]; Stoffels, 2005 [South Africa]. The findings of these studies are reported below.

2.2.2.2 Factors affecting teachers' ability to change

With respect to teacher change, particularly when introducing a new curriculum or teaching approach, research shows that teachers often believe that they are implementing what is being required of them (Kleve, 2004; Karavas-Doukas, 1996). In some cases during professional development and training sessions, teachers have been found to be receptive to learning new methods; however, "when they return to their classrooms they misinterpret the new ideas and translate them to conform to existing classroom routines, at the same time believing that they are doing what the new approach calls for" (Karavas-Doukas, 1996, p. 187).

Past research indicates that teachers may not be conscious that they are reverting to their more familiar practices or that they have misinterpreted the new techniques and knowledge (Johnson, 1994; Karavas-Doukas, 1996; Kleve, 2004; Mitchell, 2005; Pajares, 1992). Teacher education programs commonly adopt theory to practice models (Pang, 1999) with the assumption that teachers will learn the theory and then apply this to practice. The relationship, however, between theory and practice is complex and influenced by many factors (Newby, 2003). Munby (1984) referred to this incongruence between what teachers think they are doing with what they are actually doing as the 'theory-practice interface'. Newby (2003) emphasises that the assumption that the new learning "will be implemented in the classroom is both

simplistic and unrealistic” (Newby, 2003, p. 14) because of the many variables that come into play.

Research has indicated that factors related to teachers’ lack of change might be internal or external to the teachers. Factors internal to the teacher are those over which the teacher has some control, while teachers have no control over those factors external to the teacher. Internal factors identified in past research include: teachers’ self-esteem and emotional responses to the reform (Hargreaves, 2005); teachers’ confidence and motivation (Hoekstra & Korthagen, 2011; James & McCormick, 2009; Meirink et al., 2008; Stoker, 2003; Wheatley, 2005); teachers’ teaching and epistemological beliefs (Hashweh, 2004; Özkal et al., 2009; Stoker, 2003; Tsai, 2002); teachers’ knowledge about the new pedagogy and the impact of their prior knowledge (Deakin University, 2004; He et al., 2011; Hoekstra et al., 2009; Kirköz, 2008; Isikoglu, Basturk & Karaca, 2009; Stoker, 2003; Susanta, 2012; Vermunt & Endedijk, 2011; Wang, 2011); teachers’ willingness to participate in the reform and the intrinsic motivational results of classroom experimentation on their continued practice (Bakkenes et al., 2010); and teachers wanting to know more about *how* to teach (Fives & Buehl, 2008).

Past research has also indicated that there are factors that are external to teachers that influence the impact of the curriculum reform. These factors include: students’ behaviour and respect for the teacher and students’ willingness to participate (Alger, 2009; Dunn & Rakes, 2011; Hachfeld, Hahn, Schroeder, Anders, Stanat, & Kunter, 2011; Lim & Chan, 2007; Orafi & Borg, 2008; Şeker, 2011; Wang, 2011); the availability of resources (Alger, 2009; Deakin Education, 2004; Milner et al., 2011; Stoffels, 2005); and expectations of the school administration/authorities (Alger, 2009; Bentley, 2009; James & McCormick, 2009; Lee, 2008; Milner et al., 2011).

Another factor that impacts on the reform success (external to the teachers) was the support of the teacher by the school administration and instructional coaches (Bakkenes et al., 2010; Deakin Education, 2004; Dunn & Rakes, 2011; Hoekstra et al., 2009; Hoekstra & Korthagen, 2011; James & McCormick, 2009; Muofhe, 2001). Bakkenes et al. (2010) reported that groups of teachers who had had coaching and

mentoring support had greater observable success in changing their classroom practices and beliefs. These supported groups reported less negative emotions and experienced fewer struggles with experimentation and implementation of ideas. Bakkenes et al. (2010) and Vermunt et al. (2011) make a strong point in that the struggle is one of not reverting to the old ways. Şeker (2011) too reports that students' lack of readiness and willingness to participate in constructivist activities contributed to teachers reverting to traditional modes of teaching.

A major factor found to affect teachers' ability to implement reform requirements is that teachers make sense of new information by filtering and transforming the information according to their own beliefs (Clarke & Peterson, 1986; Cuban, 1998; Johnson, 2006; Milner, Sondergeld, Demir, Johnson, & Czerniak, 2011; Van Driel, Beijaard, & Verloop, 2001; Wallace & Priestley, 2011; Woolfolk-Hoy & Pape, 2006; Yerrick, Parke, & Nugent, 1997). This filtering is sense-making through personal experience, which consists of classroom, professional training, historical and biographical experiences, and through the existing values, and is influenced by many factors, such as gender, social class, upbringing and religion (Osborne et al., 1997). Findings have indicated that new language introduced during the reform was filtered through teachers' belief systems to fit with their existing beliefs and understandings (Pajares, 1992) without changing their underlying beliefs or understanding. Studies by Raths (2001) suggest that teachers were quick to align those aspects of the new teachings to that which matched their personal beliefs by retorting 'What's new?' while "teachings that challenged their beliefs were dismissed as theoretical, unworkable or even simply wrong" (Raths, 2001, p. 2). It is reported that the knowledge that is most easily retained is that which most aligns with a teacher's existing belief structure (Mitchell, 2005; Tillema, 1994).

Research in the Middle East has found that this filtering effect was used by teachers to make sense of the new curriculum and to help them to fit it with their understandings (Hashweh, 2004; Kirköz, 2008; Orafi & Borg, 2008). This was a common finding in the research where it was noted that teachers' beliefs and understanding of their delivery of the curriculum reflected "their views of what was

feasible in the light of their understandings of themselves as teachers” (Orafi & Borg, 2008, p. 243).

Interestingly, the requirements of the reform were found to create cognitive conflict. It was only in cases where this conflict made sense to the individual teacher that there was a shift in the teacher’s ideas, beliefs and practices (Hashweh, 2004). A common finding in research during a time of change was that the teachers’ epistemological beliefs (how they believed the content of a subject should be taught and was learned) played an important role in determining what pedagogical practices they believed should be used for a particular subject (Hashweh, 2004; Milner et al., 2011; Özkal et al., 2009; Stoker, 2003; Tsai, 2002; Wallace & Priestly, 2011).

Research carried out in developing countries such as Papua New Guinea, South Africa and the Middle East indicate that an additional challenge for the reform effort was teachers’ lack of knowledge about subject content, poor curriculum understanding and lack of pedagogical knowledge (Deakin Education, 2004; Kirköz, 2008; Orafi & Borg, 2008; Rugh, 2002; Susanta, 2012). This lack of knowledge was reflected in teachers’ practice, with many of them not having sufficient skills to conduct group work or manage student behaviour (Lim, 2007; Şeker (a), 2011; Wang, 2011). This lack of knowledge affected the teachers’ ability to adopt the curriculum changes.

In some cases, the teachers’ lack of knowledge was attributed to the gap between what is taught in universities and what the reality is in schools (Alkhaldeh, 2010), particularly with reference to the Middle East. In other countries such as Papua New Guinea (PNG) (Deakin Education, 2004) and Indonesia (Susanta, 2012), where long term support of teachers through formal and informal professional development, coaching and mentoring, although some changes were observed, these were, by and large, limited.

This disconnect between the reform policies and the teachers’ classroom practice has been referred to as “the gap between rhetoric and reality” (de Segovia & Hardisan,

2009. p. 161). In the Asian, Middle East and South African contexts this disconnect has been attributed to:

- Time constraints on finishing the syllabus and the workload faced by teachers, who regarded student-centred teaching as time costly (Jordan, Alkhaldeh, 2010; South Africa, Stoffels, 2005; rural China, Wang, 2011);
- Teachers need to maintain control of the class (Japan, Gorsuch, 2000; Libya, Orafi & Borg, 2008; Turkey, Ozkal et al., 2009; rural China, Wang, 2011). The Asian context was strongly dictated by teachers' beliefs in the need to be in control, to instruct and give the facts in order to prepare students for exams. While this had been reported in the South African and Middle Eastern context it was not as strong a factor as in the Asian context.
- Lack of suitably qualified teachers (rural China, Wang, 2011);
- Teachers not wanting to take the risk and then be blamed and exposed for poor results (rural China, Wang, 2011);
- Lack of sufficient teacher training, resources, and mentoring support (Thailand, de Segovia & Hardison, 2009; Libya, Orafi & Borg, 2008);
- The cultural world of the teachers influencing their beliefs and cognitive processes (South Africa, Grosser & Lamb, 2008, UAE, Mpofo, 1998; UAE, Richardson, 2004);
- Socio-cultural expectations of society (Taiwan, Aldridge et. al., 1999).

Education in the Middle East has, up until recently, had very strong traditional, transmission-based textbook educational pedagogies (Clarke & Otaky, 2006; Rugh, 2002). The lists of obstacles cited for teacher implementation of constructivist pedagogies expands considerably in this region. The gap between the rhetoric and the reality in this group has been attributed to more factors:

- A lack of accreditation or external evaluation systems for Arab education (Rugh, 2002);
- Large numbers of Arab expatriate teachers in the Gulf States (Rugh, 2002) who have little motivation for instructional change in schools (Alkhaldeh, 2010; Sayed, 2003);

- A lack of understanding by teachers (Alkhawaldeh, 2010; Kirkgöz, 2008; Ogan-Bekiroglu & Akkoç, 2009);
- The teachers' background and training is insufficient (Kirkgöz, 2008);
- A lack of guidance for teachers (Alkhawaldeh, 2010);
- Insufficient resources (Alkhawaldeh, 2010);
- Influence of textbooks (Kirkgöz, 2008);
- The need to hold onto control of the classrooms (Libya, Orafi & Borg, 2008);
- The perception of the teacher's role (Ogan-Bekiroglu & Akkoç, 2009);
- Teachers' beliefs about collaborative work (Kirkgöz, 2008);
- Poor teachers' understanding and ability (Kirkgöz, 2008; Alkhawaldeh, 2010);
- Inadequate teacher preparation (Alkhawaldeh, 2010); and
- Overloading of teachers with other duties (Alkhawaldeh, 2010).

Most of the reform changes have assumed that teachers understand the need for reform, what is expected of them in their new role in the classroom and the new pedagogy required, and are capable of learning and implementing the desired new pedagogies (Maclellan, 2008). As was reported in Table 2.3, teachers' lack of understanding and knowledge of the curriculum and pedagogy was reported to affect any change in their beliefs and practices. Stoffels (2005) remarked that teachers' strong reliance on the textbooks indicated their lack of pedagogical literacy. Teachers who are pedagogically literate should be able to "design their own representations of knowledge rather than absorbing representations preconceived by others" (Maclellan, 2008, p. 1986); however, teachers were reported to copy activities and worksheets from the textbooks (Stoffels, 2005). Pedagogical content knowledge is regarded as being unique to teachers "insofar as it represents the capacity of a teacher to transform content knowledge into forms that are pedagogically powerful and yet adaptive to the variations in ability and background of students" (Maclellan, 2008, p. 1988). Shulman (1997) labelled this as pedagogical reasoning, and regarded it as being central to his model of teaching. A lack of pedagogical understanding and reasoning would severely inhibit the change required of teachers.

Studies in the Asian, Middle East and South African contexts reported teachers' lack of understanding of the curriculum and of how to plan for outcomes/constructivist teaching (Deakin Education, 2004; Stoffels, 2005). Teachers in the Middle East and South Africa were found to lack subject content knowledge (Stoker 2003), pedagogical knowledge (Kirkgöz, 2008; Orafi & Borg, 2009; Rugh, 2002; Stoffels, 2005), were largely unaware of teaching strategies (Kirkgöz, 2008), and were constrained by cultural values (Grosser & Lombard 2008; Kirkgöz, 2008; Richardson, 2004). There was also a need in these educational contexts for more time and support for teachers (Muofhe, 2001) as well as more learning support materials for teachers (Stoffels, 2005).

If, as discussed earlier, the success of education reforms depends, to a large extent, on the beliefs that teachers hold and whether these beliefs can be changed from a traditional belief system to a constructivist one (Eisenhart et al., 1988; Meirink et al., 2009; Mitchell, 2005; Prosser, Trigwell, & Taylor, 1994; Şeker (a), 2011; Van Driel et al., 2007; Wallace & Priestley, 2011). In order to implement education reform, teacher beliefs will need to be changed in line with the reform philosophies (Benjamin, 2003; Fives & Buehl, 2008; Hachfeld et al., 2011; Meirink et al., 2009; Mitchell, 2005; Ogan-Bekiroglu & Akkoc, 2009; Roehrig & Kruse, 2005; Şeker (a), 2011).

My study drew on this past research in examining the factors that were likely to impact the implementation of the reform efforts in Abu Dhabi. Given that no studies in the context of this system-wide reform have examined teachers' beliefs and the factors affecting teacher change in this context, this study contributes to the knowledge in this area.

2.2.2.3 *Mandated change in non-Western countries*

The curricula used to drive many of the reform efforts in non-Western countries are borrowed from the West (Kirköz, 2008). These curricula make assumptions about the teachers' familiarity with classroom practices that are derived from Western cultures — a very different milieu from that of the Middle Eastern, Asian and African

countries. For example, Lim and Chan (2007) found that Asian culture was particularly focused on examination results, which emphasised traditional teaching methods and reinforced strong authoritative control by teachers (Gorsuch, 2000). The focus on examination results in the past in many countries, resulted in teachers having strong traditional beliefs about teaching and learning that determined their pedagogy (Tsai, 2002). This conditioning made the “passing from empiricist and behavioural perspectives towards constructivist, a difficult and complicated transformation” (Tsai, 2002, p. 780).

Past research suggests that the lack of pedagogical change cannot be attributed entirely to teachers’ beliefs. While there may be a perception that teachers will embrace the change expected by the reform for the greater good of the organisation, in reality, participants might resist internalising the change and consider the ways in which it will affect them personally (Fullan & Ballew, 2001), such as:

- the increased work load and the need for further training;
- additional responsibilities that mostly come without additional remuneration;
- the time needed for preparation, understanding and implementation, with little or no adjustment made to the work schedule or allocation of additional resources to an on-going and consistent program;
- a possible threat to their self-esteem if they are unable to learn and implement the change.

For example, Şeker (2011a) found that, during the Turkish education reform (which began in 2004), teachers and students had no experience of working together, they were likely to fall back on their original understanding of their role, that is, to be in control and to disseminate information, while students remained passive receptors (Şeker, 2011a). In situations where students are unaware of the teacher’s expectations in a constructivist setting, they may not participate appropriately in the activities, which forces teachers to return to their familiar traditional practices. In addition, for teachers who have not been trained, or have little/no experience in conducting group work, this may prove daunting and difficult (Stoffels, 2005).

Past research has indicated that culture may be a factor that affects teachers' ability to implement constructivist reform initiatives. In these studies, cultural values impose powerful constraints on individual behaviour and can create gaps and restrictions in teacher understanding and implementation practices (Mpofu et al., 1998; Richardson, 2004). The word culture in this context refers to the accepted social structures and modes of behaviour, where responsibility lies in communities that "created by shared common experiences of people living in the same countries" or communities (Orr & Hauser, 2008, p. 2). Clarke and Otaky (2006, p. 112) define culture in the UAE setting as "a way of life, a network of meanings" with strong Arab-Islamic value. Hofstede (1980) explained that the different values that predominate in groups are clear in this national culture. These mental programs, he explains, are formed within the family from early childhood through socialisation and reinforced through schooling and other areas in one's life and upbringing.

The tribal nature of the Arab world revolves around the collective and not, as in the West, the individual. Consequently "people are socialised to get along with one another and are expected to subordinate personal ambition to the common good", where it is important to know one's place for the maintenance of social order (Richardson 2004, p. 433). Richardson (2004, p. 431) explains that "teachers' underlying values and beliefs affect their interpretation of the educational practices they experience". These cultural societal norms underpin society and education in the UAE, so that teachers carry with them "assumptions about the social world [and] about teaching and learning" (Richardson, 2004, p. 112) that may be incongruent with the expectations of the practices required by the curriculum reform. Hofstede (1984) describes a tribal society such as UAE as a masculine one characterised by an accepted unequal distribution of power (Orr & Hauser, 2008). People feel threatened when in ambiguous situations or in conflict with the cultural norms, and try to avoid such situations. Consequently, because of the unequal distribution of power that "puts different weights on status consistency" (Hofstede, 1984, p. 65) teachers, who are lower in status than the Emiratis who mostly fill the school management positions, are put in a quandary about whom to obey – ADEC or their school administration?

Hokal and Shaw (1999) elaborate on the position of the teacher and the complexities of the power relationships:

Head teachers are constrained in their roles. They all referred to the ministry as the source of instructions and pictured themselves as followers of such instructions... In an atmosphere of mistrust, lack of horizontal cooperation and in the face of difficulties in coordination when seeking to implement policy, head teachers can offer little in the way of staff development opportunities. ... For teachers very real issues are at stake, but they are very often less to do with the students' effective learning than with the teachers' private concern for the renewal of their contract. (Hokal & Shaw, 1999, p. 177)

The curriculum in Arab schools has a considerable amount of Islamic instruction, not only in the Islamic studies but woven into most subjects (Rugh, 2002). There is no questioning permitted of the Quran, which creates a "transmissive and authoritarian" (Hokal & Shaw, 1999, p. 176) pedagogy with an emphasis on rote learning (Rugh, 2002). Students have come to accept their passive role and view the teacher's role as one of dissemination of information (Richardson, 2004). It is therefore not surprising that students would resist a change in a system, which expects them to be more active and to take responsibility for their own learning.

It is apparent from the research that, even in Western countries, the shift to a constructivist pedagogy has often been less than successful, with little change observed in teachers' practice (Alger, 2009; Bakkenes et al., 2010; Jorgensen et al., 2010; Kleve, 2004; Mitchell, 2005). The situation becomes more complex in the Middle East, where the change to a constructivist pedagogy has not been a gradual introduction with dialogue and discussion taking place, but a sudden introduction that has required swift cognitive shifts. Kirkgöz (2008) summarises this problem thus:

The curriculum change rhetoric implied that teachers be familiar with classroom practices deriving mainly from the interpretation-based culture, a different Western borrowed educational culture developed in a totally different cultural milieu.

Teachers were expected to make the professional adjustments to enable stated curriculum objectives to be achieved. (Kirkgöz, 2008, p. 1862)

The present study builds on and extends past research related to teachers' beliefs as part of the reform process. Despite much research related to the role of teachers' beliefs in reform efforts around the world, there is a dearth of literature related to education reform in the United Arab Emirates. This study fills this gap by examining how teachers' understandings of the reform requirements have been influenced by their beliefs. Furthermore, this study contributes to research into large-scale curriculum reform, particularly in non-Western regions such as the Middle East, where cultural perceptions are different from those of the West.

2.3 Traditional and Constructivist Education Philosophies and Pedagogy

Given that my study examined how teachers who had previously taught using a traditional approach to teaching translated the notion of constructivist practice into their classrooms, it is important to provide a description and history of the traditional (Section 2.3.1) and constructivist (Section 2.3.2) philosophies of education and their associated pedagogies. This highlights the changes required of teachers during the education reform taking place in Abu Dhabi, and how teachers' beliefs might have influenced their understanding of the new education philosophy. A knowledge of each of the philosophies and associated practice is essential in order to be able to identify teachers' practice as well as to evaluate teachers' understanding of the terminology and hence the behaviours they believed were expected from them.

The reform process that was underway in Abu Dhabi at the time of writing this thesis has involved teachers shifting their practice from a traditional approach to a constructivist one. Such reforms became more evident in Western education systems during the 1970s with the dawn of the so-called 'information era'. The emphasis shifted in classroom pedagogy from "what teachers do to an outcomes-focus on what students achieve and an emphasis on catering for student individual differences" (Aldridge, Fraser, Fisher, 2003, p. 167). Education in American schools throughout most of the twentieth century has been dominated by traditional or behaviourist

learning theories which tended to over-shadow constructivism, even though constructivism was reflected in the education standards (Benjamin, 2003). This anomaly implies that a large percentage of the teachers held traditional views of teaching and learning that affected their practice and ability to comply with the education standards. The situation is of concern for sustainable education reform within the Abu Dhabi context, where the traditional teaching model has been the favoured *modus operandi* practised, known and desired by teachers since the onset of formal schooling in the region (Clarke & Otaky, 2006; Gaad, Arif, & Scott, 2006; Richardson, 2004).

To understand and appreciate teachers' beliefs with respect to the reform demands, it is important to understand the philosophy and pedagogy associated with each paradigm. To this end, Section 2.4.1 describes the main attributes of the traditional education philosophy and pedagogy, and Section 2.4.2 describes the constructivist education philosophy and pedagogy.

2.3.1 Traditional Philosophy

The term *traditional* as used to describe an approach to teaching and learning is one that refers to an accepted *modus operandi* of teacher control and student compliance that has been operational for centuries in formal education. In medieval Europe, education revolved around the religious institutions of society, where monks were tasked with copying religious books that had to be studiously copied without mistakes. In the *madrassas*³ of the Middle East, boys would be sent to learn to write and to recite the holy Quran. There was no room for mistakes, questioning or individual creativity. Obedience and compliance were important so as not to distort the holy message. Similarly, young Jewish boys would memorise passages of the Talmud as a requirement for coming of age. The calligraphers of the Far East emphasised precision and repetition in order to strive for perfection (Rheault, personal communication, October 2008). For centuries, memorisation and repetition has become synonymous with education and to do so perfectly would indicate an excellent student.

³ Islamic religious schools in the Middle East.

The onset of the industrial era saw the introduction of mass education in a bid to sustain the emerging industrial economies (Toffler 1991). Workers needed to be trained and conditioned to understand and accept the timings and needs of factory environments. Consequently, bells or sirens were used to indicate a change of shift and workers were required to learn to be compliant and obedient with respect to the work that had to be executed. Creativity or independent thinking were limited and were premised upon the needs of the factories (Adam, 2004; Toffler, 1991) resulting in a focus on basic literacy and numeracy and unquestioning compliance and obedience (McDonald, 1997; Toffler, 1991). The traditional approach to teaching and learning suited the desired end results perfectly.

Traditional teaching and learning has been referred to in a number of ways, including: the behaviourist method (Benjamin, 2003); subject matter-oriented education beliefs (Meirink et al., 2009; Van Driel et al., 2007); transmission model beliefs (Chai, 2010; Taylor, 1990); teacher-centred beliefs (Alger, 2009); and empiricist or logical positivist beliefs (Tsai, 2002). The traditional/behaviourist approach holds that “children are empty vessels which the teacher needs to fill up” (Adams, 2006, p. 245). This model, attributed to the psychologist B. F. Skinner, is characterised by the teacher determining the desired behaviour, measuring the behaviour in the students, rewarding positive behaviour and punishing negative behaviour (Jensen, 1996).

Schommer (1990) identified five epistemological beliefs (summarised in Table 2.2), all of which fit well with a more traditional approach to teaching; these are authority knowledge, quick knowledge, certain knowledge, simple knowledge and innate knowledge.

The first of these, authority knowledge, assumes that knowledge is provided by an authority figure and is not open for questioning. This knowledge is commonly memorised because it may not be questioned. For example, the Qur’an is memorised and recited but never questioned. This type of knowledge is commonly associated with tribal societies. Ozkal, Tekkaya, Çakiroglu, and Sungur (2009) comment that

such knowledge is not associated with any deep learning, being largely a replication of memorised content. Quick knowledge is the belief that learning occurs in a short time or not at all. Students either get it or they don't and consequently, there is no need for monitoring for understanding, thus students are likely to have a poor understanding (Ozkal et al., 2009). Certain knowledge is a belief that knowledge is fixed and unchanging. Such an understanding negates any notion of multiple perspectives or the possibility of many answers or solutions. Simple knowledge is the belief that knowledge consists only of facts that are supported by a traditional textbook curriculum. A belief that knowledge is innate is the notion that the ability to learn is fixed at birth. Research shows that students who believed that knowledge is handed down by authorities, fixed and innate, certain and unchanging, adopted a surface rather than a deep approach to learning, while those who "believed that learning needs effort and understanding were more likely to employ deep approaches while studying" (Ozkal et. al., 2009, p. 73).

Table 2.2 Five Dimensions of Epistemological Beliefs (adapted from Schommer, 1990, p. 500)

| | Epistemological Beliefs | Description |
|---|-------------------------|--|
| 1 | Authority knowledge | Knowledge that is handed down by those in authority. |
| 2 | Quick knowledge | The belief that learning occurs in a short time or not at all. |
| 3 | Certain knowledge | The belief that knowledge is unchanging. |
| 4 | Simple knowledge | Knowledge consists of isolated facts. |
| 5 | Innate knowledge | The belief that the ability to learn is fixed at birth. |

Based on these dimensions, then, teachers who believe that a subject consists of facts that need to be learnt and memorised are more likely to use the traditional approach to teaching (Kang & Wallace, 2005).

Behaviourists did not regard learning as a cognitive process requiring effort on the part of the learner; rather, they held that a student has or does not have the ability to memorise the material presented to him (Chai, 2010). Learning was seen as the student "making associations that lead to alterations in displayed behaviour" (Adams, 2006, p. 245) such as duplication and recall of memorised facts. This resulted in a

culture of dependence upon the teacher, and the locus of control of performance was with the teachers (Watkins, 2001). As such, teaching was designed to ensure that students were mostly obedient and compliant and did what they were told to do, often resulting in surface understanding but with little sense of purpose (Weedan, Winter, & Broadfoort, 1999). The resulting classroom climate was one of student passivity and obedience, where teachers were regarded as the font of knowledge.

The assessment of learning in traditional education settings was in the form of quizzes and examinations, and students were trained to do well through recall of facts; the degree and accuracy of memorisation was regarded as the benchmark of success (Stoffels, 2005; Taylor, 1990). Pressure was put upon teachers and students to achieve high grades, resulting in much examination content instruction, practice in using past examination papers and repetitive drill exercises with “teaching methods skewed in an attempt to maximise marks” (Adams, 2006, p. 247). Students, in turn, were expected to achieve high scores (Bichelmeyer & Hsu, 1999; Boghossian, 2006; Taylor, 1990), with high-scoring students being rewarded with scholarships, special parties, bursaries and overseas trips, while lower-scoring students were regarded as poor students, under-achievers, stupid or slow. The stakes were high for good memory and recall (Adams, 2006). While this method often results in students achieving high test scores, this is generally achieved without a corresponding improvement in conceptual understanding, which is often observed to have decreased (Shepard, 2000) so that students’ “performance is but a surface manifestation of *possible* underlying competencies” (Adams, 2006, p. 244). The test scores are poor reflections of students’ real cognitive strengths, their understanding, or their ability to use or to transfer the information.

The pedagogy of the traditional approach is a didactic teacher-centred one in which the teacher teaches using direct instruction to students whose job it is to listen, attend to the teacher and memorise the given facts (Al-Shammari, Al-Sharoufi, & Yawkey, 2008; Boghossian, 2006; Tsai, 2002). Knowledge, in this context, is not dependent on reflection but on content acquired from outside sources that the student is expected to absorb through lecture-based, direct instruction pedagogy (Bichelmeyer & Hsu, 1999), often with a reliance on textbooks (Roelofs & Terwel, 1999). Traditional

pedagogy, sometimes referred to as the ‘chalk ’n talk’ approach (Taylor 1990), emphasises “the authority of the teacher and disempowers students from evaluating the validity of their own knowledge, resulting in students retaining their own viable interpretations of an event reproducing correct, but personally meaningless, replicas for the teacher” (Taylor, 1990, p. 4).

Traditional teaching may still be regarded as the most prevalent teaching approach today, despite the technological advancements and a vast array of new topics (Gardner, 2000). Reform efforts in countries around the world, including the UAE, have been initiated in recognition that the world has changed and that successful participation in global economics demands critical, creative, problem-solving individuals and that traditional teaching practice may not adequately equip students.

2.3.2 Philosophy of Constructivist Education

Today’s global society and information era has seen a shift beyond the need for compliance, obedience and recall to a call for the skills to critically evaluate knowledge, to be creative in using and transferring the knowledge into new contexts, and to be effective problem solvers and decision makers (Chadwick, 2009; Gardner, 2000; Howard & Fogarty, 2004; Iley, 2009; Lewis, 2009; Swartz, Costa, Beyer, & Reagan, 2008; Sylwester, 2005).

In response to this shift, the constructivist theory of learning began to replace behaviourist theories in the Western world, during the late 1970s (Kotzee, 2010). Curriculum reform, also referred to as education reform and education innovation, became common, with various scales of implementation from individual schools to national reform. During this time, the main thrust in reform agendas was the implementation of pedagogy to support a constructivist view of learning (Alkhaldeh, 2010; Kirkgöz, 2008; Lim & Chan, 2007; Rugh, 2002), being underpinned by the idea that “knowledge is not based on a set of unambiguous or universal ‘truths’; instead one knows the world through interactions between the known and the world phenomenon” (Marra, 2005, p. 140).

Three education psychologists, Dewey (1902), Piaget (1934) and Vygotsky (1934) were instrumental in laying the foundations for constructivist education. Dewey (publications from 1927 to 1938) was honoured as being one of America's greatest educators (Hargreaves & Shirley, 2009). He viewed education and learning as a social and interactive activity in which students thrive in environments where they can interact with and experience the curriculum and have an opportunity to be active in their own learning. The teacher's role was not to impose his ideas and information onto students but to provide quality experiences, through which students grow and learn. Dewey was not against the delivery of content but insisted that this be presented in such a way that it allowed the students to relate their prior experiences to the content and, in so doing, deepen the connection with the new information (Dewey, 1938).

In the early 1900s, Piaget, through observing his own children, developed a theory of cognitive development that influenced education theory and practice and inspired European and American education thought and practice in the 1970s and 1980s. He postulated that children move through various phases of cognitive development prior to being able to use deductive reasoning and abstract thinking. A key feature of Piaget's theory was that children learn through interactions in the classroom, making sense of the world around them (Ackermann, 2004; Cherry, 2013; McLeod, 2008). Piaget's (1954) research indicated that children learn best when they puzzled things out through tasks designed for specific learning purposes, hands-on activities and cooperative learning practices. For Piaget, knowledge was not information to be delivered, encoded, memorised, retrieved and applied, but, rather, an experience acquired through an interaction with the world, people and things where teaching is always indirect and where knowledge must be assimilated by the student and cannot be transmitted (Ackerman, 2004; Cherry, 2013; Piaget, 1954). To this end, Ackerman (2004, p. 7) states:

Children are builders of their own cognitive tools as well as of their external realities – knowledge and the world are both constructed and constantly reconstructed through personal experience. Knowledge is not merely a

commodity to be transmitted, encoded, retained and re-applied, but a personal experience to be constructed.

Vygotsky, a contemporary of Piaget, lived in Russia, where his work was not initially shared with or known in the West. As with Piaget, Vygotsky (1962) proposed that the individual constructs his own knowledge. He differed from Piaget, arguing that students learn through social interaction and dialogue, and that culture and language are the tools for learning (Woolfolk, 2004). Thus learning was seen as occurring through speaking and doing with others, listening to others' ideas, arguments and understandings, and using these to formulate one's own understanding.

These three educators laid the foundation for further constructivist thinking and development. Among eminent educators who later expanded constructivist concepts were Papert (1960s to 1991), Bruner (publications 1966 to 1996) and von Glasersfeld (publications 1989 to 2008). Papert (1991) explored the use of tools (external aids) such as cultural artefacts, technology and media in constructivist education. Bruner (1966) showed the importance of the role of the adult in scaffolding, guiding and creating suitable learning opportunities for the student. Von Glasersfeld (2008) expanded views on the basic constructivist theory, highlighting the importance of the social components of student and teacher interaction, dialogue, verbalisation and conversation. Von Glasersfeld (2001) also highlighted the teacher's role in creating opportunities to trigger students' thinking and to make the process of knowledge construction a more deliberate and conscious one.

The trend towards constructivist thinking was termed the progressivist education movement, and began as an American phenomenon, which spawned the child-centred movement in Europe and the United Kingdom (Muller, 2001). Progressivism gained momentum when it became increasingly clear that "industrialism and mass schooling together were producing an uneducated and unskilled working class" (Muller, 2001, p. 59). The children of the working class were believed to have been disadvantaged by public schooling, where traditional pedagogy had never been questioned because it had "never been considered that there was an alternative" (Muller, 2001, p. 59). Policies related to education began to move towards progressivism, particularly in

Western democracies that supported the progressive movement such as the USA, the UK, Norway, Australia, New Zealand, and some African countries (Beck, 2000). A driving force in education in countries that supported progressivism was to prepare students for a democratic society, and a socio-constructivist curriculum was seen to do this.

The constructivist philosophy of learning is built on the premise that the individual constructs understanding within their own mind (Adams, 2006; Bichelmeyer & Hsu, 1999; Boghossian, 2006; Lieberman & Pointer-Mace, 2009), and that knowledge comes through their experiences and interactions with others and not from someone else (Airasian & Walsh, 1997; Lattuca, 2006; Vygotsky, 1962). Thus, the student and the teacher are active partners in the learning process and co-constructors of knowledge (Adams, 2006). There is an implied assumption that both the student and the teacher are willing to engage and participate and understand their roles in the learning process. These roles are different to those required in the traditional approach (where students are seen as passive receptors). In the process of learning, students construct understanding and produce a product whereby their mastery of the desired outcomes may be demonstrated and measured.

For the purposes of this study, no distinction will be made between the terms constructivism, constructionism and socio-constructivism. The terms constructivist/constructivism will be used when referring to these variations of the progressive education philosophies.

While the term *constructivist theory* is often used in the literature to imply a pedagogical practice, it is worth noting that constructivism is “an epistemological theory (a theory of what knowledge is) and not a pedagogical theory” (Kotzee, 2002, p. 177). There is no prescription as to how students should be taught; however, terms such as student-centred learning, active learning and collaborative learning are used almost synonymously with constructivism. These terms are used as a means of informing and directing the pedagogical approach that is to be followed by the teacher. The constructivist approach has been referred to using a number of terms, all of which tend to describe the pedagogical approach, that is, a student-oriented

approach (Dunn & Rakes, 2011; McCombs & Lauer, 1997; Meirink et al., 2009; Van Driel et al., 2007), a progressive approach (Meirink et al., 2009), an inquiry-based approach (Roehrig & Kruse, 2005), and a relativistic approach (Chai, 2010). In the constructivist classroom the teacher's role is one of guiding, coaching and stimulation, where the teacher is referred to as a facilitator (Richardson; Roelofs & Terwel, 1999). The role of the teacher also entails designing experiences that encourage and enable learning (Lattuca, 2006).

Louw and Jensen (2013) posit that a teacher's teaching style stems from his/her belief as to whether students are children that have to be shaped or treated as adults to be questioned. As such, learning is seen as being "fundamentally linked to the social and cultural context" (Louw & Jensen, 2013, p. 104). Louw and Jensen (2013) (Figure 2.1) propose a spectrum varying from the perception of students positioned as kids to be shaped, to the perception of students as adults on trial.



Figure 2.1 The Student Positional Scale (Louw & Jensen, 2013, p. 110)

The left side of the spectrum reflects a more traditional view of students, in which teachers regard students as (potentially) irresponsible and irrational, requiring shaping. This view is likely to lead to teaching that maintains tight control on the classroom environment and the decisions for the learning process. "The teacher identifies rules and conditions for students' work and behaviour in the school and makes clear what is right and wrong" (Louw & Jensen, 2013, p. 110). This view tends to prevail in schools that are structured by outside regulations such as standardised testing, where the norm is the acquisition and reproduction of fact based knowledge (Louw & Jensen, 2013). At the other end of the spectrum, teachers regard students as young adults on trial. In this case teachers are more likely to regard students "as (potentially) responsible and (self) engaged in learning" (Louw & Jensen, 2013, p. 110). The environment, in this case, is more likely to be

characterised by loose teacher control over communication, where students' knowledge, opinions and experiences are valued.

To make judgements as to whether a teacher's classroom practice is traditional or constructivist, it is necessary to have a clear understanding of constructivist expectations of the teacher's role and pedagogical approach. Constructivist theorists and practitioners imply constructivist pedagogy from the theory. The most common accepted principles are that constructivism:

- Involves personal constructions of reality (Adams, 2006; Airasian & Walsh, 1997; Boghossian, 2006; Bichelmeyer & Hsu, 1999; Capper & Jamison, 1993; Lattuca, 2006; Roelofs & Terwel, 1999);
- Involves learning environments of experimentation and dialogue (Adams, 2006);
- Accepts multiple perspectives and representations of data (Adams, 2006; Boghossian, 2006);
- Concerns active learning (Adam, 2004; Bichelmeyer & Hsu, 1999; Davson-Galle, 1999; Lieberman & Pointer-Mace, 2010; Richardson, 2003; Roelofs & Terwel, 1999);
- Involves collaboration and negotiation with others and with teachers (Adams, 2006; Airasian & Walsh, 1997; Boghossian, 2006; Fraser, 1998; Lattuca, 2006; Lieberman & Pointer Mace, 2010; Taylor, 1990);
- Has a focus on the learning and not on performance or final product (Adams, 2006; Airasian & Walsh, 1997);
- Accepts a view of students as active co-constructors of meaning and knowledge (Adam, 2004; Fraser, 1998; Rink, 2001);
- Focuses on pupil-teacher relationships that are built upon the idea of guidance not instruction (Adam, 2004; Adams, 2006; Boghossian, 2006; Lattuca, 2006; Richardson, 2003; Roelofs & Terwel, 1999);
- Accepts the engagement of students in tasks as ends in themselves and as having implicit worth (Adams 2006; Bichelmeyer & Hsu, 1999; Capper & Jamison, 1993);

- Understands that assessment is an active process of uncovering and acknowledging shared understanding in the form of on-going assessment of developmental learning and formative assessment through tasks and observations of students' mastery of skills (Adams, 2006);
- Accepts students sharing control of the classroom (Fraser, 1998).

The teacher's function for a constructivist pedagogy can be extrapolated as designing suitable, challenging tasks to meet the demands of particular desired learning outcomes, supplemented by materials and resources to scaffold the learning process and supported by compatible social constructions such as cooperative learning, group work, paired work, and so on (Airasian & Walsh, 1997; Dewey, 1938; Lattuca, 2006; McLeod, 2008; Richardson, 2003). The teacher's role is to create the environment to support these activities, to model and guide students and facilitate the learning for the advancement of each student, while at the same time monitoring the development of each student (assessment for learning) and providing suitable feedback to the students to ensure that learning is progressing and the students are motivated (Adams, 2006; Bruner, 1996; Joldersma, 2011; Lattuca, 2006; Richardson, 2003). A constructivist classroom is described as being student-centred, where each student is actively engaged, on task, working and collaborating with each other and the teacher in order to create meaning and understanding through appropriate activities (Lattuca, 2001; Capper & Jamison, 1993; Richardson, 2003). The teacher, like a conductor of an orchestra, facilitates the learning process. However, teachers who have transmission-based epistemologies may favour traditional teaching, thus Windschitl (2002) argues that it is necessary for teachers to have an underlying constructivist-oriented epistemology in order to change to a constructivist paradigm.

Content knowledge is easily learnt, however it has been shown that this memorised information is unlikely to be transferred into practice (Perkins, 1992; Swartz et al., 2008; von Glasersfeld, 2001). So too, the new content is unlikely to change a teacher's beliefs into a successful transfer of the new concepts into their established practices because "knowledge, no matter how it is defined, is in the heads of persons, and... the thinking subject has no alternative but to construct what he or she knows on the basis of his or her own experience" (Joldersma, 1995, p. 280). The teachers,

like their students, will need time to work with this new paradigm and construct meaning themselves, “to participate in the process that makes possible the establishment of knowledge... to take part in the process of knowledge getting. Knowing is a process, not a product” (Bruner, 1966a, p. 72).

This review of constructivist and traditional approaches to teaching created a foundation for the development of the Teacher Belief Survey which was used to determine the Arab teachers’ beliefs about their role in the classroom and pedagogy after having been immersed for many years in a traditional approach. This instrument provides a simple means of determining teachers’ beliefs in this regard as well as a tool for teacher self-reflection. The study supports the findings of the literature in that teachers believed they were implementing what was required for the constructivist pedagogical approach; however, the study contributes to the gaps in previous research by emphasising the need to determine whether teachers had a common understanding of the constructivist strategies and techniques. Furthermore, findings with respect to the factors that influence teachers in their implementation of the constructivist approach have contributed to the research in this area. These factors were found to be both external when the teacher had no control over them, and internal when they were within the control of the teacher. The model proposed by Louw and Jensen (2013) provided insight and explanations into the Arab teachers’ beliefs and practices, in particular that the approach was that students were empty vessels to be filled with information and facts.

2.4 Learning Environments

Unlike the traditional approach to teaching, the constructivist approach requires a learning environment conducive to students being able to exchange ideas, and evaluate new ideas through experimentation, individually or collaboratively (Adam, 2004; Airasian & Walsh, 1997; Davson-Galle, 1999; Lattuca, 2006; Lieberman & Pointer-Mace, 2010; Richardson, 2003; Rink, 2001; Roelofs & Terwel, 1999).

Considerable research into learning environments has established the importance of the learning environment in teaching and learning (Afari, Aldridge et al., 2013;

Aldridge, 2012a; Aldridge et al., 2006; Aldridge & Fraser, 2008; Aldridge et al., 2000; Dorman et al., 2006; Fraser, 1986; Fraser, 1989; Fraser, 2007; Midgley et al., 1991; Taylor et al., 1995). The classroom is a socially dynamic entity, an environment responding to the personalities, control mechanisms, authorities and task inputs. The learning environment is the “key component towards an interactive, constructivist approach to learning” (Bloese, 2002, p. 42) and it is within this dynamic environment that learning takes place. Nichols and Zang (2011) propose that, if teachers do not create an affirmative environment, then the learning environment they create may be undemanding or destructive for students.

Extensive research over the past 40 years has indicated that students’ perceptions of their learning environment can provide an accurate gauge of the teachers’ approach in the classroom (Afari et al., 2013; Aldridge et al., 2009; Fraser, 2012). It was considered pertinent, therefore, to examine whether there was a relationship between teachers’ beliefs about their role in the classroom, their philosophy of education and the students’ perceptions of constructivist-oriented aspects of the learning environment. Therefore, this section reviews literature related to the field of learning environments. The section starts by providing a brief overview of the history of the field and its theoretical underpinnings (Section 2.4.1), then goes on to review past research within the field (Section 2.4.2).

2.4.1 Historical Overview

The classroom learning environment as reported in my study refers to the social, psychological and pedagogical contexts in which teaching and learning occurs. Past research has provided strong and consistent evidence to suggest that the context in which learning occurs is related to students’ affective and cognitive outcomes (Fraser, 2007, 2012; OECD 1990, 2009; Yang, 2013). Further, over the past four decades research related to learning environments has proved to be a reliable and effective means of evaluating education initiatives and to assist in changing teachers’ pedagogical practices (Aldridge et al., 2012).

The field of learning environments has its roots in the work of early psychologists including Lewin (1936) and Murray (1938). Lewin's (1936) field theory acknowledged that the environment and its interaction with individuals' personal characteristics were strong determinants of human behaviour. To comprehend a person's psychological behaviour, Lewin contended that one's behaviour must be determined for every kind of psychological event, including one's actions, emotions and expressions, for the momentary structure and the state of the person, and for the psychological environment.

Murray (1938), like Lewin, was also attracted to the internal determinants of behaviour. In his opinion, Lewin's interest in the external determinants of behaviour omitted a theory of drive or need. Murray's 'needs-press' model overcame this shortcoming by including the situational variables found in the environment and which account for a degree of behavioural difference. Murray made a distinction between 'needs' and 'press.' He defined needs as "...a force (the psycho-chemical nature of which is unknown) in the brain region ... which organizes perception, apperception, intellection, conation, and action in such a way as to transform in a certain direction an existing, unsatisfying situation" (Murray, 1938, p. 123). Press was defined as "a temporal gestalt of stimuli which usually appears in the guise of a threat of harm or promise of benefit to the organism" (Murray, 1938, p. 124), or the external influences on motivation. Thus, Lewin and Murray are widely accredited with having established the groundwork for substantive research in the field of learning environments.

Withall (1949) was one of the first researchers to attempt to categorise and observe interactions in the classroom, using trained observers who recorded elements of interaction in the classroom. A framework for the analysis of classroom structures as a unique social system where classes, personality needs, role expectations and classroom climate interact to predict group behaviour and learning outcomes was created by Getzels and Thelen (1960). Walberg and Anderson (1972) determined that students' perceptions of a wide range of instructional and social cues relevant to their own learning could be acquired within the time of a classroom lesson. Questioning students about their perceptions has an advantage over the observations of teachers in

that it receives input from a much larger sample and is based on many hours of experiential student observations (Fraser & Walberg, 1991). Fraser (2001) points out that students, through experience of many different classroom environments, are in a good position to make such judgements.

The first learning environment questionnaires used in the educational arena were developed in the late 1960s in the United States. The Learning Environment Inventory (LEI) was developed by Walberg (1968) as part of the research and evaluation activities of Harvard University's Harvard Project Physics, a national curriculum development project to create a secondary school physics education program in the United States (Walberg & Anderson, 1968). Walberg's research demonstrated that the classroom climate could be reliably and economically measured. His research suggested that individual student's satisfaction with the climate of a classroom would enhance learning, verifying that climate variables were good predictors of student learning outcomes (Anderson & Walberg, 1974).

At around the same time, but in a different study, Moos (1979) began developing the first of his social climate scales that eventually resulted in the development of the Classroom Environment Scale (CES) (Moos, 1979; Moos & Trickett, 1987). The CES was based on research involving perceptual measures of a variety of human environments, including psychiatric hospitals, correctional facilities, university residences, and work milieus (Moos, 1979).

Three basic dimensions of human environments were identified by Moos: the relationship dimensions (measure the nature and intensity of personal relationships); the personal development dimensions (measure personal growth); and the system maintenance and system change dimensions (measure the extent to which the environment maintains clear objectives and controls and responds to change). The information about these dimensions has been used in subsequent research to provide a fairly accurate picture of a teacher's pedagogical approach. The scales of learning environment instruments have been consistent with Moos's three dimensions of human environments and most instruments have sought to provide good coverage of each.

As a result of the work of Walberg and Moos, classroom learning environment research has grown immensely, including the continuing development of other learning environment instruments developed for specific subjects and purposes (Aldridge et al., 2012; Aldridge, 2012; Goh & Khine, 2002; Wubbels & Levy, 1993). Appendix 2 includes a table with 10 historically important and contemporary instruments that have been developed in the field of learning environments for a range of reasons. This table includes the names of the instruments, the educational level for which they were developed, the developer and date of development, the number of items per scale and scale classifications.

The use of learning environment questionnaires has enabled researchers to identify important criteria for the effective evaluation of curriculum and education innovations (Fraser, 2002). Learning environment research has been used to monitor and examine the success of the implementation of new curriculum in studies that have been carried out in South Africa (Aldridge, Fraser, Bell, & Dorman, 2012; Aldridge, Laugksch, Seopa, & Fraser, 2006; Aldridge et al., 2009) and Western Australia (Aldridge et al., 2012).

Learning environment questionnaires have been used to provide valuable information about whether teachers are adopting traditional or constructivist approaches in their classrooms, including information about: the degree of cooperation and discussion between students in the classroom; the teacher-student relationships; the level of participation of students in lessons; and the involvement of students in teaching and assessment methods. The next sections provide a brief overview of research undertaken in the field of learning environments (Section 2.4.2) and the instruments developed in the field of learning environments (Section 2.4.3).

2.4.2 Past Learning Environment Research

Over the past 40 years, learning environment research has been carried out in countries around the world for a range of different purposes. Fraser (2012) identified nine main lines of research that have been carried out: school psychology; links

between educational environments; cross-national studies; transition between different levels of schooling; typologies of classroom learning environments; determinants of the classroom learning environment; associations between student outcomes and the environment; learning environments and outcomes-focused classrooms; and evaluation of education innovations. Table 2.3 summarises the nine main lines of learning environment research (identified by Fraser, 2012).

The strongest line of learning environment research has involved investigations of associations between students' cognitive and affective learning outcomes (Fraser, 2012), where much research has shown that "students' perceptions account for appreciable variance in learning outcomes, often beyond that attributable to background student characteristics" (Fraser, 2012, p. 1218). Research carried out in different countries has indicated this strong and consistent relationship at different education levels, including: primary school (Goh & Fraser, 1998, Fraser et al. 2002, Goh & Khine, 2002), middle school (Fraser & Kahle 2007, Khalil & Saar, 2009, Yang, 2013), high school (Wong & Watkins, 1996; Opolot-Okurut, 2010) and tertiary level (Afari et al., 2013; Al Zubaidi & Aldridge, 2016; Aldridge et al. 2012; Chien, 2007; Kember, 2009; MacLeod & Fraser, 2010).

Given the important influence of the quality of the learning environment to student achievement, paying attention to the environment developed will, according to Fraser (2001), pay dividends. Further, measures of learning outcomes alone are unlikely to "provide a complete picture of the education process" (Fraser 2007, p. 116).

Of relevance to this study is the application of learning environment questionnaires as a source of process criteria of effectiveness in curriculum evaluation. The learning environment is influenced by the nature of the curriculum. For example, an examination-driven curriculum is likely to result in less student participation and more teacher-centred approaches (Aldridge et al., 1999).

Table 2.3 Lines of Learning Environment Research, Description and Researchers

| Line of Learning Environment Research | Description | Researchers |
|---|--|--|
| 1 School Psychology | Learning environment research creates an opportunity for school psychologists and teachers to gain insight into aspects of classroom life and to use this as a basis to guide improvements in classrooms (Fraser, 2012). | Burden & Fraser, 1993; Fraser, 1987; Sink & Spencer, 2005. |
| 2 Links between Educational Environments: Home and school | Researching the influence of two or more environments – home and school. | Marjoribanks, 1991; Moos, 1991. |
| School level environment | Whether the nature of the school environment influences what goes on at the classroom level. | Aldridge, Fraser & Laugsh, 2011; Fraser & Rentoul, 1982; Fisher, Grady, Fraser, 1995. |
| 3 Cross-National Studies | Research that crosses national boundaries to gain insight into various areas of interest, e.g. teaching methods, education practices, national beliefs and attitudes. | Aldridge, Fraser & Huang, (Australia/Taiwan) 1999; Aldridge & Fraser, (Australia/Taiwan) 2000; Aldridge, Fraser, Taylor & Chen, (Australia/Taiwan) 2000; Fraser, Aldridge & Adolphe, (Australia/Indonesia) 2010. |
| 4 Transition between different levels of schooling | Transition from primary to middle/high school. | Ferguson & Fraser, 1998; Midgley, Eccles & Feldlaufer, 1991. |
| 5 Typologies of Classroom Environments | Identification of the learning environment orientation. | Moos, 1978, 1979; Brekelmans, Levy & Rodriguez, 1993; Rickards, den Brok & Fisher, 2005; den Brok, Telli, Çakiroglu, Taconis & Tekkaya, 2010; Dorman, Aldridge & Fraser, 2006. |
| 6 Classroom Environments as determinants | Investigations of various determinants of classroom environment. | |
| Gender perceptions of the classroom learning environment | Females tend to perceive the same classroom environment more favourably. | Quek, Wong, & Fraser, 2005; Teh & Fraser, 1995; Dorman & Fraser, 1996. |
| Teacher/student perceptions of classroom learning environment | Teachers tend to perceive a more favourable learning environment than students. | Byrne, Hattie & Fraser, 1986; Fisher & Fraser, 1983. |
| Grade level and ethnic differences | | Castillo, Peiro & Fraser, 2006. |
| Teachers attempts to improve | Teachers using feedback from students actual and | Aldridge, Fraser, Bell & Dorman, 2012; Aldridge, Fraser & Ntuli, |

| Line of Learning Environment Research | Description | Researchers |
|---|---|---|
| classroom and school environments | preferred response perceptions of the learning environment. | 2009; Aldridge, Fraser & Sebela, 2004; Docker & Fisher, 1988; Fraser, 1981; Fraser, Fraser & Fisher, 1986; Sinclair & Fraser, 2002; Yarrow, Millwater & Fraser, 1997 |
| 7 Associations between student outcomes and environment | Investigations of associations between students' cognitive and affective learning outcomes. | Fraser, 1994; Fraser & McRobbie, 1995; Goh, Young & Fraser, 1995; McRobbie & Fraser, 1993; Teh & Fraser, 1995; Wong & Fraser, 1996. |
| Student-teacher interpersonal behaviour | | Telli, den Brok & Çakiroglu, 2010 |
| Psychological Learning environment | Model of educational productivity. | Walberg, 1981. |
| 8 Learning environment and outcomes-focused classrooms | Investigations of learning environment suited to outcomes-focused education. | Aldridge & Fraser, 2008; Aldridge, Laugksh, Seopa & Fraser, 2006; Aldridge, Laugksh & Fraser, 2006. |
| 9 Evaluation of Educational innovations | | Aldridge & Fraser, 2008; Fraser, 1979; Khoo & Fraser, 2008; Maor & Fraser, 1996; Martin-Dunlop & Fraser, 2008; Nix, Fraser & Ledbetter, 2005; Pickett & Fraser, 2009. Teh & Fraser, 1994. |

Past research has indicated that student responses to learning environment instruments have allowed researchers to differentiate revealingly between alternative curricula even when student outcome measures have shown little sensitivity (Fraser, 1979; Fraser, Williamson & Tobin, 1987). An evaluation of the Australian Science Education Project study (Fraser, 1979, 2007) revealed that, when compared with a control group, students perceived their classrooms as being more satisfying and individualised and as having a better material environment. This research demonstrated a differentiation between the learning environment and curricula of the two groups (Fraser, 2007).

Research involving the use of learning environment instruments to evaluate educational innovations has been carried out around the world. For example, in Singapore, learning environment instruments have been used to evaluate computer-assisted learning (Teh & Fraser, 1994a, 1994b) and computer courses for adults (Khoo & Fraser, 2008). In other countries such as Australia, classroom environment instruments have been used for the evaluation of an outcomes-focused, technology-rich school (Aldridge & Fraser, 2008). The use of learning environment criteria has illuminated the impact of a wide range of educational programs or approaches, including: computer-assisted learning in Australia (Maor & Fraser, 1996, 2005) and Canada (Raaflaub & Fraser, 2002); enhancing students' metacognition regarding chemistry learning (Thomas & Anderson, 2014); innovations involving anthropometry activities in science education (Lightburn & Fraser, 2007); Year 11 earth science in Korea (Cho, Yager, Park & Seo, 2004); inquiry-based science instruction for middle-school students (Wolf & Fraser, 2008); the effectiveness of a teacher professional development programme (Soebari & Aldridge, 2015); an innovative science course for prospective elementary students (Martin-Dunlop & Fraser, 2008); strategies for engaging adults who experienced childhood difficulties (Hasan & Fraser, 2015) the use of technology in mathematics classes (Chipangura & Aldridge, in press); and the effectiveness of the Science and Mathematics Integrated with Literary Experiences (SMILE) project carried out with fifth grade students in the United States (Mink & Fraser, 2005). Three of these studies are described in more detail below.

Lightburn and Fraser (2007) used the Science Laboratory Environment Inventory (SLEI) to evaluate the effectiveness of using anthropometry activities in science education. Their study involved a sample of 761 high school students in South Florida and the results indicated that, relative to a comparison group, students' perceptions were more positive on some scales of the SLEI.

Martin-Dunlop and Fraser (2008) used an instrument developed to assess the laboratory learning environment instruments in their evaluation of an innovative science course for prospective teachers. Their study involved a pre-post design with a sample involving 525 university students in 27 classes. The findings indicated statistically significant improvements on all seven scales assessing the laboratory learning environment, with the largest gains being for Open-Endedness and Material Environment (with effect sizes of 6.74 and 3.82 standard deviations respectively).

Nix, Fraser and Ledbetter (2005) evaluated an innovative science teacher professional development programme that was based on the Integrated Science Learning Environment Model. They used the Constructivist Learning Environment Survey (CLES), with a unique side-by-side format to examine 445 students' perceptions of the learning environments created by the teachers who had attended the professional development opportunity, and to compare them with the classes of other teachers who had not. Students perceived the classes of teachers who had attended the teacher development course to have higher levels of Personal Relevance and Uncertainty (as assessed by the CLES) than the comparison classes.

Duschl and Waxman (1991) comment on the practical difficulties that teachers have in integrating theory with actual practice. Any new curriculum requires changes in teacher behaviour (Wubbels & Levy, 1993). The use of learning environment instruments has the potential to provide "information about subtle but important aspects of classroom life" (Fraser, 2007, p. 116). Therefore, the present study drew on and extended research in the field of learning environments by using a learning environment instrument to examine students' perceptions of the learning environment as teachers implemented the reform requirements. This study also examined the impact of teachers' beliefs on students' perceptions of the constructivist nature of the learning environment.

The present study drew on and extended past research in the field of learning environments. As one of only a handful of learning environment studies to be carried out in the UAE, this study makes a contribution to the field by modifying, translating and validating a learning environment instrument developed to examine students' perceptions of the constructivist-oriented nature of the classroom environment. Further, this is, to the best of my knowledge, the first time that a learning environment survey has been used to examine whether students' perceptions of the learning environment were related to the teachers' beliefs about teaching and learning and their views of their own approach to teaching (in terms of constructivist notions).

2.5 Chapter Summary

An explanation of teachers' epistemological and pedagogical beliefs and how these inform teachers' actions in the classroom is provided in Section 2.2.1. Epistemological beliefs refer to the beliefs that teachers hold about how knowledge is acquired and how they believe it should be taught. For example, teachers who believe that knowledge is about acquiring and memorising of facts are more likely to adopt the traditional approach to teaching. Teachers' epistemological beliefs are shown to influence their choice of pedagogical practice, depending on how they view knowledge of a particular subject. Pedagogical beliefs refer to teachers' preferred way of teaching, how the classroom is organised, and the relationships between students and teacher and student and student.

Teacher beliefs are described as an interplay of the teachers' knowledge base that is made up of pedagogical knowledge, general knowledge, knowledge of students and their characteristics, and knowledge of education philosophies and the historical roots. Teachers form their personal teaching beliefs through their own years of exposure to teaching as students and from their experience in the classroom. This interplay of knowledge has been shown to determine teacher actions in the classroom.

Section 2.2.2 explains that during a period of education reform, teachers tend to dilute and filter the intentions of the reform, change activities to match their personal theory of teaching, and interpret reform intentions according to their own frames of reference.

Research related to teachers' beliefs and classroom practice is primarily confined to curriculum reform in school districts, school-wide programs (often primary schools) or specific curriculum areas such as mathematics and science, in Western nations such as USA, Canada, England, Norway and The Netherlands. In contrast, education reform in Singapore, Thailand and South Africa has been countrywide. These reforms involved mandated change where a paradigm shift from a traditional to a constructivist approach in teaching was expected. The results for Western regions reported that even when teachers reported positive intentions, their practice remained unchanged.

International research findings acknowledge that for teachers to change from a traditional to a constructivist approach entailed a profound shift in how teachers think about teaching and learning in order to conform to the reform requirements. The shift requires an understanding of education philosophies and principles and the acquisition of new skills such as lesson planning, pedagogical practice and behaviour management. Two distinct categories of findings emerged as factors that influence teachers' implementation of reform requirements. These are: 1) factors that are seen as being within the teacher's control such as teachers' knowledge and understanding; and 2) factors regarded as being outside of the teacher's control such as support by school administration and parents, provision of teaching resources, student readiness and mentoring. Similar findings emerged in the education reform research regarding the Middle East, South Africa and Asia, where it was reported that the teachers lacked pedagogical literacy, and the knowledge and skills needed to implement constructivist practices. Greater success in the implementation of reform initiatives was reported in cases where teachers had been supported with coaching and mentoring for a number of years.

In the research, the effect of the social culture is described as constraining teacher behaviour. Where a society focuses on the collective, such as in the tribal nature of

the Arab world, the unequal distribution of power presents a problem to teachers and school leaders, as their position is not one to make decisions but to implement what is dictated to them from above. The students are expected to be passive acceptors of the information and not to question, and so too, the teachers must accept the instructions from above. A constructivist approach may be regarded as being in conflict with the societal structure. Asian and Middle East research found that students were not willing, equipped with the skills nor had the understanding necessary to participate in a constructivist curriculum.

The differences between traditional and constructivist philosophies are described in Section 2.3, pointing out that constructivism is a philosophy of education with assumed pedagogies, unlike the traditional approach to teaching where pedagogy is firmly stated as being didactic, authoritative, and transmission-based, and students are expected to memorise the facts. A description of the traditional approach with specific reference to a Middle Eastern setting is provided.

The rationale for adopting a constructivist approach for today's world was provided by Dewy, Piaget and Vygotsky, who promoted a concept of learning as socially interactive and constructed by the individual through the provision of quality activities by the teacher. The pedagogies of these approaches are described in order to provide an understanding of the change that is required of teachers when switching from one paradigm to the other. This section further describes the expected teacher's classroom role as facilitator and co-creator of knowledge, and the assumed pedagogy for a constructivist setting. This was compared to the traditional approach to further an appreciation of the changes that are required of teachers.

Learning environment research is described in Section 2.4. This area of research has become more important as an indication of teaching and learning and student progress. This study provides a window into the teaching and learning practices through the students' eyes. This perspective may assist in understanding teacher beliefs and practices in the classroom, because the implementation of a constructivist approach entails a change to the classroom learning environment. A historical overview of the field of learning environments is provided, describing the rationale for this field of study and the development of the first instruments. Learning environment surveys and past research in this area, in particular the association of the

quality of the learning environment with students' achievement levels and the use of learning environment research to evaluate education innovations, are described.

Chapter 3 provides a description of the research methodology guiding this study: the development of the teacher belief instrument, and the research into teacher beliefs and classroom practice.

Chapter 3

Research Methods

The truth is rarely pure and is never simple.
Oscar Wilde

3.1 Introduction

The overarching aim of this study was to examine the beliefs that teachers in Abu Dhabi held with respect to their implementation of the reform curriculum and whether these were consistent with their classroom practice. Chapter 2 provides a review of literature related to the study, and this chapter describes the research methods used. These are described using the following headings:

- Research Design (Section 3.2);
- Research Objectives (Section 3.3);
- Samples (Section 3.4);
- Data collection (Section 3.5);
- Data Analysis (Section 3.6);
- Ethical Considerations (Section 3.7); and
- Chapter Summary (Section 3.8).

3.2 Research Design

This study used a mixed methods approach involving the collection of both qualitative and quantitative data. Mixed methods studies gained acceptance as a research approach after it was used by Campbell and Fisk in 1959, and they encouraged others to follow suit. The main advantages of this approach are two-fold: first, through the use of different data sources, biases can be minimised; and, second, through triangulation, data may be converged, integrated or combined to enable greater understanding (Creswell, 2009; Creswell & Plano Clarke, 2007, 2011).

Denzin and Lincoln (2000) argue that no single method can grasp the subtle variations in on-going human experience and therefore, a wide range of

interconnected methods provide more meaningful insights into the worlds that are studied. In examining a social phenomenon, there is an expectation that different perspectives, experiences and feelings will arise in different people, even though they might experience the same situation. Therefore, I viewed my role as one in which I constructed explanations to help to make “sense of the evidence” (Mathison, 1988, p. 15). Thus the strength of using multiple sources served to corroborate interpretations and to bring to light other perspectives or inconsistencies of the problem, rather than being a tool to verify or validate findings.

A mixed methods approach was a means by which triangulation could be used to validate the research findings, to provide a variety of perspectives, and to increase the depth of understanding (Berg, 2009; Miles & Huberman, 1994). In addition, a mixed methods design enabled me to “look at different places and at different things in order to understand the phenomenon” (Henning, van Rensburg, & Smit, 2009, p. 20).

Although I was immersed in the research environment (through my role as an education adviser), the findings were not predetermined but arose through discovery-oriented research (Creswell, 2009; Henning, van Rensburg, & Smit, 2009). Yin (2011) explains that it is important for the researcher to be open to new ways of seeing the issues “when unexpected evidence is encountered” (Yin, 2011, p. 104) and, therefore, to be unbiased in the data collection through any preconceived ideas or “mental framework” (Yin, 2011, p. 104). Further, he emphasises that when and if such new evidence is discovered, the researcher may need to rethink the original protocol, and where such discovery is significant, a review of the study and original objectives should be conducted. This may require a review and restatement of the research questions. Thus, throughout the data collection phase of this project, although I had some mental frameworks of the problem, I was receptive to any new, significant evidence.

Creswell and Plano Clarke (2007) list four major types of mixed methods designs: the triangulation design, the embedded design, explanatory design and exploratory design. Creswell (2009) further describes three variations of the mixed methods research: sequential design (where the findings through one method are elaborated or

expanded upon with another method); concurrent design (which merges the qualitative and quantitative data to create a comprehensive analysis of the research problem in which both sets of data are collected simultaneously and then integrated); and transformative design (in which the researcher uses a theoretical lens as the overarching perspective within a design that utilises both quantitative and qualitative data). For the present study, a sequential, exploratory, design was considered to be appropriate, as it allowed the integration of data from different sources during the analysis (Aldridge, Fraser, & Huang, 1999).

My sequential design involved two distinct phases. The first phase involved a large-scale quantitative overview (using surveys) to provide information about teachers' beliefs and students' perceptions of their learning environment. This large-scale overview was used to examine trends and relationships within the data. The results of the analysis of the quantitative data were used as a starting point for the gathering of qualitative data. This information assisted in creating a context or setting (Creswell, 2009) based on the responses of the teachers and was used as a starting point for the interviews.

The second phase involved gathering qualitative information to better understand the quantitative overview. Through the use of case studies, qualitative information was used to examine the ways in which teachers transferred their stated teaching beliefs into classroom practice, and the factors that influenced their teaching practice. During this phase of the research I worked inductively through the interpretivist paradigm, whereby, using open-ended questioning during semi-structured interviews and observations in the natural setting, I searched for meaning and "the frames that shape meaning" (Henning, van Rensburg, & Smit 2009).

The present study strove to retain its identity as a single study by addressing those research questions which benefited from the use of complementary quantitative and qualitative evidence and methods, as recommended by Yin (2011). Qualitative and quantitative data were analysed and interpreted together before arriving at the conclusions of the study. Yin (2011, p. 291) cautions that, where this integration does not happen, even when the results of each method are compared after analysis, such separation "effectively splits a mixed-methods study into two distinct studies."

Working inductively, I used the data from interviews, lesson observations and quantitative surveys to make sense of the meanings the respondents expressed about their world. As a starting point, I collated and began an analysis of the survey data, graphing the results to create a visual reflection of the teachers' perceptions. Following this step I then designed interview questions that would help me to check, verify and clarify teachers' perceptions and understandings. In addition, phenomena that I noted during the lesson observations were clarified in the post-lesson interviews.

This research draws on the post-positivist and socio-constructivist/interpretivist worldviews. The post-positivist paradigm is regarded by Anderson as more holistic than the controlled environment of the positivist paradigm, where measurement and prediction are emphasised (Anderson, 1998). This research was thus conducted in the natural settings, uncontrolled by the researcher (Merriam, 2009), where the values and perspectives of participants were important considerations (Anderson, 1998). The interpretivist paradigm is described by Shulman (1997) as correlational research, where relationships between phenomena are described with the goal of understanding the variations among individuals. The interpretivist researcher is of the view that there are multiple realities rather than a single observable reality, and that knowledge is constructed with all of this in mind (Creswell, 2009; Merriam, 2009).

The words of Oscar Wilde, "The truth is rarely pure and is never simple" (cited in Ratcliffe, 2001, p. 284), emphasises the role of the interpretivist's view, which encourages the use of a variety of data from different sources to strive for validity and reality (Henning et al., 2009). It was through measurement, observation and carefully listening to peoples' thoughts, intentions, feelings and values that I strove to understand the phenomena. Through frequent consultation and interaction with practitioners in the field, I was better able to understand the different perspectives that were discussed, observed and considered throughout this research (as recommended by Henning et al., 2009).

3.3 Research Objectives

The present study took place within the context of a large-scale education reform effort in which teachers had been expected to rapidly change their teaching practices to more closely align with those associated with a constructivist paradigm. The overarching aim was to examine the teachers' views with respect to their implementation of the curriculum reform initiatives, and whether the beliefs held by teachers about teaching were consistent with their classroom practice. To address this aim, six research objectives, introduced in Chapter 1, were delineated.

Research Objective # 1

To develop and validate an instrument to assess teachers' beliefs about teaching and their role as the teacher.

Research Objective # 2

To modify, translate and validate an instrument to assess students' perceptions of their learning environment.

Research Objective # 3

To describe the teachers' views of their implementation of constructivist practices.

Research Objective # 4

To examine whether a relationship exists between teachers' beliefs about teaching and their classroom practice.

Research Objective # 5

To determine any incongruence between teachers' views of their implementation of constructivist practices and their classroom practice.

Research Objective # 6

To examine the factors external to the teacher that influence the implementation of constructivist practice.

3.4 Sample

This section details the sample for the pilot study (Section 3.4.1), the large-scale quantitative overview (Section 3.4.2), and the collection of qualitative data (Section 3.4.3).

3.4.1 Pilot Study

As the study involved two instruments (one to assess teachers' beliefs about teaching and their role in the classroom, and the other to assess the students' perceptions of the learning environment) that had not been previously used in Abu Dhabi, it was important to ensure the readability and comprehensibility of the instruments. Careful selection of the schools that were to be involved in the pilot study was done to ensure that they closely resembled the larger survey sample that was to follow. Therefore, two Cycle 2⁴ ADEC schools (in which the new curriculum was being implemented) were selected, one all-boy and one all-girl. These schools did not form part of the main sample for the research. Twenty teachers from each of the two schools were invited to participate in the pilot study (40 in total); of these, 22 volunteered, 12 from the all-male school and 10 from the all-girl school. The teachers were informed that their participation was voluntary and would contribute to the refinement of the new survey (Yin, 2011). Of these teachers, all completed the feedback sheets and three were interviewed with respect to the survey.

One of the teachers who responded to the teacher survey during the pilot study also volunteered to pilot test the student survey (described below) with one of her grade 9 classes. This was deemed an appropriate choice, as the student survey would be administered to students from grade 6 to 12. Five students who responded to the student survey during the pilot study volunteered to be interviewed.

⁴ Cycle 2 equates to grades 6 to 9 or Middle school in the Western context (explained in Chapter 1).

3.4.2 Sample for Phase 1: Quantitative Data

Following the pilot test, a large-scale administration of the surveys was undertaken. This section describes the sample in terms of the schools (Section 3.4.2.1), the teachers (Section 3.4.2.2) and the students (Section 3.4.2.3).

3.4.2.1 Selection of Schools.

The selection of the schools from which the participants were drawn involved purposeful sampling (Berg, 2009; Henning, van Rensburg, & Smit 2009; Merriam, 2009, p. 34; Yin, 2011). The criteria for the selection of each school were that it should be: first, an ADEC government school; second, staffed mainly by Arab teachers (as it was these schools that were undergoing the education reform); and third, had been participating in the education reform for five years. These schools were expected to yield the most relevant and plentiful data within the scope of this study (Yin, 2011). The selection of the schools was made in consultation with education advisers who coached and mentored at these schools. A total of nine schools were selected, ensuring a wide range of teachers with differing views, experiences and understandings. Another criterion governing the choice of schools was that the schools be located in the emirate of Abu Dhabi, with representation of schools on the island, the city of Abu Dhabi and the Abu Dhabi mainland.

A final criterion governing the selection of schools was equal gender representation. Therefore, five of the schools were all-boy schools (three Cycle⁵ 2 schools and two common⁶ schools) and four were all-girl schools (all Cycle 2 schools). The teachers and staff in the boys' schools were exclusively male and those in the girls' schools were female. All participants for both the quantitative and qualitative components were drawn from these schools.

⁵ The term Cycle is used to denote the grade levels of the school; i.e. Cycle 1 = grades 1–5; Cycle 2 = grades 6–9; Cycle 3 = grades 10–12.

⁶ The term Common school refers to a school that consists of Cycle 1 and Cycle 2, or Cycle 1, 2, 3, or Cycles 2 and 3.

3.4.2.2 Selection and Description of Teacher sample

From each of the nine schools, 30 teachers were randomly selected by the school principal, providing a total of 270 teachers. A total of 220 surveys were returned, of which 198 (approximately 73%) were usable. This large sample ensured that the sample included teachers who taught a range of subject areas as well as a range of age groups and teaching experience.

Of the 198 usable surveys, 82% of the teachers were from Arabic-speaking countries and 18% from Western nations. Of the teachers who were from Arabic speaking countries, 54% were from Jordan, Egypt, Tunisia and Syria and 28% were UAE nationals. Figure 3.1 provides a graphical representation of the nationalities of the teachers in the sample. Of the 198 teachers, exactly 50% were men and 50% were women (that is, 99 of each gender).

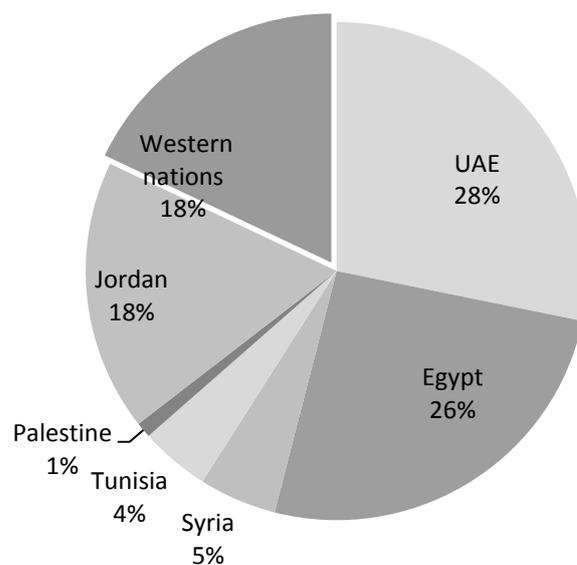


Figure 3.1 Nationalities of Teachers in the Sample

This large-scale sample ($N=198$) was used for the validation of the teacher survey. For all remaining analysis, which focused on the Arab teachers' understanding and implementation of the new curriculum, only teachers from Arabic-speaking countries were used, providing a sample of 182 teachers.

With respect to education, the Arab teachers that formed the sample for this research had all studied to the tertiary level in Arabic speaking nations such as Egypt, Jordan, the Kingdom of Saudi Arabia, UAE, Syria and Tunisia. At the time of writing of this thesis, all teachers who had been employed to teach in ADEC schools were required to have a university qualification (Bachelor of Arts or Bachelor of Science). However, a professional teaching qualification such as a Higher Diploma in Education or equivalent teaching certification was not a requirement. Of the 182 Arab teachers involved in this study, 65% did not have a professional qualification or certification (as shown in Figure 3.2).

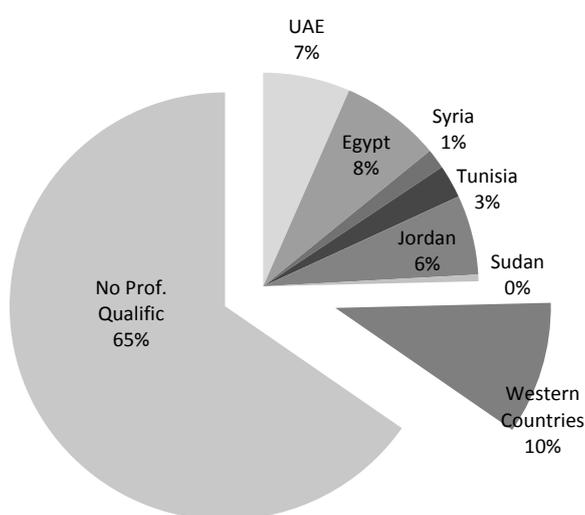


Figure 3.2 Percentage of Teachers without Teaching Certification and the percentage by nationality with teaching certification.

The age of the participants ranged from 25 to 60 years. In Abu Dhabi, when teachers reach 60 years of age they are retired and repatriated. There were, therefore, no teachers over 60 years of age.

Hargreaves (2005) classified teachers' years of work experience as beginning teachers, early career, mid-career and late career teachers. Using this classification, 60% of participants were mid-career teachers with between 10 and 24 years of experience. Beginning teachers made up 6% of the sample (with UAE nationals making up all of these, as Arab expatriates coming to work in Abu Dhabi must have at least three to five years of experience in their home country before being eligible to work in Abu Dhabi). Late career teachers made up 13% of the sample.

3.4.2.3 Selection and Description of Student Sample

To examine the relationship between the teachers' beliefs about teaching and their classroom practice, a second instrument was administered to the students of 18 intact classes of the case study teachers (see Section 3.4.3 for a description of these teachers). The classes were selected from different grade levels. Four of the classes were grade 6 classes (three all-boy and one all-girl); five were grade 7 classes (three all-boy and two all-girl); four were grade 8 classes (two all-boy and two all-girl); three were grade 9 classes (all-girl); one was a grade 10 class and one was a grade 12 class (both all boy). Table 3.1 reports the grades and number of students who participated in the study. These classes provided a sample of 420 students to whom instruments were administered. Of these, 387 (approximately 92%) of the surveys were complete and usable.

Table 3.1 Number of Students and Grade Levels in the Sample

| Class | Number of Students | Sex | Grade | Number of students per Arab Nationality in the class | | | |
|-------|--------------------|------|-------|--|-------|-------|---------|
| | | | | UAE | Egypt | Syria | Tunisia |
| 1 | 22 | boy | 6 | 16 | 3 | 3 | |
| 2 | 24 | boy | 8 | 18 | 6 | | |
| 3 | 30 | girl | 8 | 25 | 3 | 2 | |
| 4 | 25 | girl | 8 | 21 | 3 | 1 | |
| 5 | 25 | girl | 9 | 22 | 2 | 1 | |
| 6 | 25 | girl | 9 | 18 | 4 | 2 | 1 |
| 7 | 26 | boy | 6 | 26 | | | |
| 8 | 24 | boy | 8 | 20 | 2 | 2 | |
| 9 | 25 | girl | 9 | 25 | | | |
| 10 | 24 | girl | 6 | 24 | | | |
| 11 | 24 | boy | 7 | 19 | 3 | 2 | |
| 12 | 17 | boy | 6 | 17 | | | |
| 13 | 18 | girl | 7 | 18 | | | |
| 14 | 24 | boy | 7 | 17 | 4 | 3 | |
| 15 | 22 | boy | 7 | 22 | | | |
| 16 | 24 | girl | 7 | 24 | | | |
| 17 | 25 | boy | 10 | 25 | | | |
| 18 | 16 | boy | 12 | 13 | 2 | 1 | |
| TOTAL | 420 | 10 | 8 | | | | |

Students in ADEC schools were mainly UAE nationals (87%) with a small percentage of Arab students from other Arab-speaking nations such as Egypt, Syria and Tunisia. This is reported in Table 3.1. In all cases the students were Arabic speaking.

3.4.3 Sample for Phase 2: Qualitative Information

The second phase involved the collection of qualitative information. The sample for this phase consisted of 15 case study teachers (described in Section 3.4.3.1) and five education advisers (described in Section 3.4.3.2).

3.4.3.1 Case Study Teachers

Of the teachers involved in the large-scale administration of surveys, 15 Arab teachers formed the case-study component of this study. The teachers came from the same nine schools that formed the sample for the collection of quantitative data. Two English teachers from each of the nine schools were asked to be involved in the study. The selection of these teachers, made with the assistance of education advisers⁷ working in each of these schools, was purposeful insofar as the teachers needed to be Arab teachers of English (to alleviate the need for translators and minimise translation issues that could affect the data and interpretations). However, the sample was random within the group of teachers of English and depended upon the teachers' schedules as to who was asked to volunteer to be part of the case study.

The nominated teachers were approached and informed about the research. Initially, all 18 teachers indicated their willingness to participate; however, three withdrew, leaving 15 teachers who accepted the invitation to participate. Of the 15 case study teachers, seven were male (46%) and eight were female (53%).

The proportion of Arab nationalities among the case study teachers was similar to the larger sample, with 10 of the case-study teachers being Arab expatriates and five UAE nationals. Figure 3.3 reflects the nationalities of the case study teachers.

Similar to the larger quantitative sample, 65% of the case study teachers did not have a professional qualification/certification, that is, 35% of teachers responded as to having a professional qualification. This was not taken to be a true account of

⁷ Education advisers were experienced Western teachers who had been recruited to assist with the reform by working with the teachers in the schools as coaches and mentors.

professional certification, as many teachers considered workshop professional development attendance certificates as being a qualification.

The work experience of the case study teachers was also similar to the large sample, with the majority of teachers falling into the mid-career grouping. The case study sample did however, have a greater proportion of beginning teachers (20%) than the larger quantitative sample and there were no late career teachers.

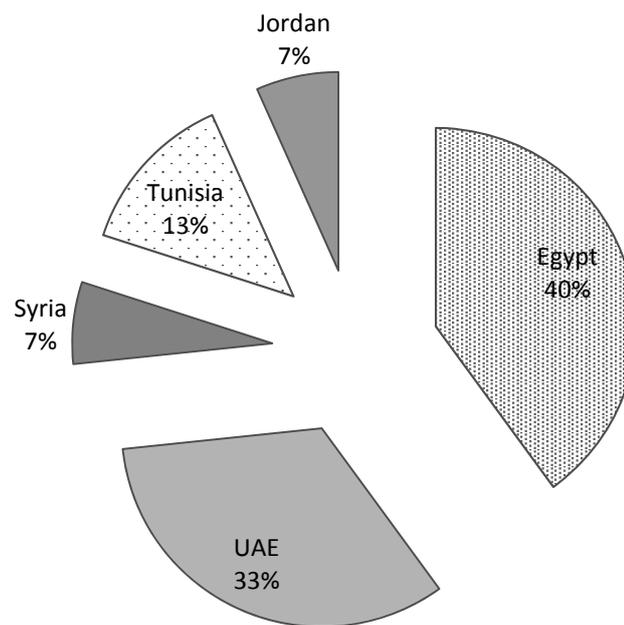


Figure 3.3 Nationalities of Case Study Teachers

The similarities between the larger sample and the case study sample suggest that the case study could be representative of the larger sample. Therefore, it was anticipated that the inferences and interpretations from the smaller to the larger group would make the findings more generalisable.

3.4.3.2 Education Advisers

Five education advisers (four men and one woman) formed an expert panel with whom I consulted for clarification and understanding of the situation in the field. The five education advisers all had extensive teaching experience in both Western and

Abu Dhabi contexts. Their role was to coach and mentor teachers, provide demonstration lessons for teachers, and generally assist teachers in their understanding and implementation of the pedagogical changes required. Their familiarity with both the traditional and constructivist philosophies of education made the expert panel ideally placed in this process. This panel volunteered to assist in the scheduling of interviews and data collection because of their work and presence in the schools. The panel were interviewed and provided further insight into the phenomena and helped to minimise bias on the part of the researcher.

3.5 Data Collection

This section describes the instruments used and data collection for both the quantitative and the qualitative data. The collection of quantitative data, phase 1 of the study, is described in Section 3.5.1, and the collection of qualitative information for phase 2 is described in Section 3.5.2.

3.5.1 Instruments for Phase 1: Quantitative Data Collection

This section provides a description of the two instruments used to collect the quantitative data for the large-scale overview —the Teacher Belief Survey (Section 3.5.1.1), and the Constructivist Oriented Learning Environment Survey (Section 3.5.1.2). The translation and pilot testing of the instruments are described in Section 3.5.1.3.

3.5.1.1 Teacher Belief Survey (TBS)

The Teacher Belief Survey (TBS) was developed to provide an overview of the teachers' beliefs about teaching and learning. The development of this new instrument followed a four-stage approach. The first stage involved the identification and development of salient scales related to teachers' beliefs about their roles and classroom practice. This stage consisted of two steps. First, an extensive review of literature and research into teachers' beliefs and practices and a review of literature and research pertaining to traditional and constructivist pedagogies was carried out

(described in Chapters 1 and 2). Through this process, key components of teacher beliefs and traditional/constructivist pedagogies considered by researchers and practitioners to be important were identified. The second step involved the definition of scales based on the literature review. This helped to ensure content validity by ensuring the scales were based on a sound theoretical framework.

The second stage involved writing items for each of the scales that were delineated. This stage involved three steps. In the first step, items from previously developed instruments were reviewed and, where appropriate, adapted. The second step involved, where necessary, writing additional suitable items for each scale. Once the items for each scale had been written, the third step involved inviting the expert panel to assess the items for each scale for comprehensibility, clarity, accuracy and relevance to each scale. This was done through round-table discussions where comments were noted and items refined and re-assessed. At this point the expert panel was also asked to suggest additional items where they felt that items did not adequately address the construct, were unsuitable or were not sufficiently comprehensive. Based on these reviews the scales and items were revised.

Stage 3 involved the translation of the TBS into Arabic. This involved a five-step process that is described in Section 3.5.1.3.

Stage 4 involved field-testing the newly developed instrument with 20 teachers. The main purpose was to ensure face validity, readability and comprehensibility of the items. A feedback sheet was included for each of the participating teachers (a copy of which can be found in Appendix 3). Details of the pilot testing are provided in Sections 3.4.1 and 3.5.1.2.

The TBS consisted of five scales: the role of the teacher; teacher's philosophy of learning and knowledge acquisition in the classroom; pedagogy – choice of delivery; collaboration; physical environment; and assessment. The number of items in each scale varied from nine to thirteen, each of which were responded to using a five-point frequency response format of Almost Never, Seldom, Sometimes, Often and Almost Always. Details of the development and a description of the scales included in the TBS are reported in Chapter 4.

3.5.1.2 *Constructivist-Oriented Learning Environment Survey (COLES)*

To provide an indication of the extent to which the teachers were using pedagogical practices that were in line with their stated beliefs, the Constructivist-Oriented Learning Environment Survey (COLES) was used. The COLES, developed by Bell and Aldridge (2010) to assess students' perceptions of their learning environment, consisted of 11 scales considered to be pertinent to classrooms with a constructivist orientation. Although it is acknowledged that a questionnaire cannot assess every aspect of the learning environment, the selected scales were considered to be relevant. Many of these scales have also been shown in past research to be good predictors of student outcomes (Aldridge, Fraser, Bell & Dorman, 2012).

For the purpose of this study, the COLES was modified to ensure its relevance to the research questions. Only scales related to the reform pedagogy were included, these being: teacher support; equity; young adult ethos; formative assessment; clarity of assessment criteria; involvement; task orientation; personal relevance; cooperation; and differentiation. To provide insights into the student-teacher relationships within the lesson, the shared control scale from the Constructivist Learning Environment Survey (CLES) (developed by Taylor, Fraser & Fisher, 1997), was included. The final version included 11 scales of six items, providing a total of 66 items. A scale description and sample item for the modified version of the COLES, used in this study, is provided in Table 3.2.

Students responded to the items using a five-point frequency response format of Almost Never, Seldom, Sometimes, Often and Almost Always. The original survey's layout and colouring was retained, as it did not resemble a traditional examination paper (which might have invoked negative emotional responses in students).

As described earlier, a pilot study involving five students was used to examine the face validity of the modified COLES. Interviews with these students were used to check for translation issues and to ensure that students were interpreting items in ways that were intended by the researcher. In addition, this pilot study was used to examine whether students were able to use the response format effectively, whether

there were any technical issues, and to ascertain the time taken for students to complete the survey.

Table 3.2 Scale Description and Sample Items for the Modified COLES

| Scale | Scale Description | Sample Item |
|-----------------------|--|--|
| | The extent to which ... | |
| Shared Control | ...students participate in planning, conducting and assessing of learning. | I help the teacher to decide how well I am learning. |
| Equity | ...students are treated equally by the teacher. | The teacher gives as much attention to my questions as to other students' questions. |
| Young Adult Ethos | ...teachers give students responsibility and treat them as young adults. | I am given responsibility. |
| Formative Assessment | ...students feel that the assessment tasks given to them make a positive contribution to their learning. | I use feedback from assessment tasks to improve my learning. |
| Clarity of Assessment | ...the assessment criteria are explicit so that the basis for judgments is clear and public. | I understand how to complete assessment tasks successfully. |
| Involvement | ...students have attentive interest, participate in discussions, ask questions and share ideas. | My ideas and suggestions are used during classroom discussions. |
| Task Orientation | ...it is important to complete activities planned and to stay on the subject matter. | I am ready to start this class on time. |
| Personal Relevance | ...subject is relevant to students' everyday out-of-school experiences. | I relate what I learn in this class to my life outside of school. |
| Cooperation | ...students cooperate rather than compete with one another on learning tasks. | We work in groups (or pairs) in this class. |
| Differentiation | ...teachers cater for students differently on the basis of ability, rates of learning and interests. | I am able to work at the speed which suits my ability. |

3.5.1.3 *Translation and Pilot Testing of the Instruments*

As ADEC Cycle 2 and common schools were staffed mainly with Arab expatriate teachers, it was anticipated that many would have only a working understanding of English. Also, the students in the selected schools spoke Arabic and had little or no English language knowledge. It was important, therefore, that the instruments were translated into Arabic. My experience from working in Abu Dhabi for five years prior to the research indicated that the use of official translation agencies might not be satisfactory, as many academic terms and subject specific terminology either do not exist in the Arabic language or cannot be translated easily. Therefore, a literal translation by agencies, who may not have an understanding of the subject discipline and specific language concepts, was not considered suitable. To overcome this, and to ensure equivalence in the Arabic versions, a process of back translation, as recommended by Ercikan (1998) and Warwick & Osherson (1973), was used. This process enabled a comparison of the English and Arabic versions to ensure that they were consistent both in meaning and intent.

The translation of the instruments followed a five-step process. The first step involved selecting an Arabic speaking colleague who was fluent in English and working within the field (to ensure a good knowledge and understanding of the terminology and discipline), and requesting them to translate the documents. It was important that the intended purpose of the documents was made clear. To this end I spent time working through the documents with my colleague to ensure common understanding and intentions of the statements.

The second step involved removing the English statements on the documents and asking a second Arabic-speaking colleague with similar credentials to the first to translate the items back into English. This process enabled a comparison between the original and translated versions.

After I had compared the back-translated version with the original English document, the third step involved questioning the second translator about irregularities. In some instances the difference was deemed to be the initial translation into Arabic and, in other cases, the English phrasing by the second translator was a simplification of the

initial wording. For example, the English version of Item #2: “*As the teacher, it is my role to deliver factual information to students*” was back translated to read: “*As a teacher I have to deliver real information.*” Another example was Item #16: “*Students learn best when they all complete the same worksheet.*” The back translation for this item was: “*When students do the same task, they learn better.*” A further example was Item #31, which read: “*My lessons involve activities that cater for students with different abilities.*” This was back translated to read: “*My classes include activities that provide for students with different abilities.*” After consultation with both translators it was agreed to make small changes to the Arabic translation.

After adjustments, the fourth step involved the first translator rechecking the translated documents. Minor dialectic revisions were made until both translators were satisfied that the Arabic version of the survey read as the English version had intended.

The layout of TBS and COLES in the final version involved a dual-language English and Arabic format, in which the Arabic translations were placed directly next to or below the English statements. As some of the respondents were from English speaking backgrounds, having a dual-language layout was considered to be more efficient. This layout also allowed respondents familiar with both languages to judge the translation for themselves (Yin, 2011) and allowed the same document to be used for both the English and the Arabic respondents. Further, using a dual layout reduced the risk of the intended meaning of the items being compromised (Dirani & Kuchinke, 2011). Dual-language layouts have been used successfully in past research in the UAE (Afari, Aldridge, Fraser & Khine, 2012) and in South Africa (Aldridge, Laugsh, Seopa & Fraser, 2006). A copy of the English and Arabic wording for individual items of the surveys can be found in Appendix 4 and Appendix 5 (for the TBS and COLES, respectively).

Once translated, both instruments were pilot tested to examine technical aspects of administration and the face validity of the individual items. For the teacher survey, described in Section 3.5.1, administration was carried out with the help of education advisers who were working at the schools. The teachers were asked to provide

critical feedback about the survey as they responded to items. Teachers were given a feedback sheet, which asked them to comment on:

- a. The layout of the questionnaire
- b. Any problems or issues with respect to translation
- c. Any problems or issues in understanding the questions or the instructions
- d. And ‘anything else’, where respondents could add any of their own personal comments or suggestions.

As indicated in Section 3.5.1.1, a copy of this feedback sheet inviting comments from participants in the pilot study can be found as Appendix 3. After completion of the survey and analysis of the feedback sheets, interviews were held with three of the participants to check for their understanding of the items.

Two of the teachers volunteered to pilot the student survey with their classes (one all-boys class and one all-girls class). They administered the survey to the students, explained the reason for the survey and monitored the students during the completion of the survey. The teachers reported back to me on how their students had responded to the surveys and noted that they had not encountered any problems.

3.5.2 Instruments for Phase 2: Qualitative Data Collection

This section describes the gathering of qualitative information in the second phase, including: the need for the case study (Section 3.5.2.1); observations of the lessons (Section 3.5.2.2); the interviews with the case study teachers (Section 3.5.2.3); and the interviews with the expert panel (Section 3.5.2.4).

3.5.2.1 The Need for the Case Study

The case study method lends itself to an investigation of individuals within a bounded group in their natural setting, with a focus “aiming to preserve and understand the wholeness and unity of the case” (Punch, 1998, p. 150). Van Maanen suggests that a true cultural description can only come from:

... a period of intimate study and residence in a given social setting ... [which] ... calls for the language spoken in that setting, first-hand participation in some activities ... and most critically, a deep reliance on intensive work with a few instruments drawn from the setting (van Maanen, 1982, p. 103).

In my capacity as an education adviser in the schools with the teachers, I was afforded such immersion and was, therefore, in a position to make comparisons between data and understandings through engagement with the phenomenon. Bromley (1986) advocates case study because:

It gets as close to the subject of interest as they possibly can, partly by means of direct observation in natural settings, partly by their access to subjective factors (thoughts, feelings, and desires)... [Furthermore] case studies tend to spread the net for evidence widely (Bromley, 1986, p. 23).

The strength of using a case study for this study, Erickson (1986) argues, is that “the general lies in the particular, what we learn in a particular case can be transferred to similar situations [because] it is the reader, not the researcher, who determines what can apply to his or her context” (as cited in Merriam, 2009, p. 51).

Limitations of case study methods are largely related to the researcher, who is in a position to decide how much to report and what to report. This goes hand-in-hand with the sensitivity and integrity of the investigator and may involve an “unusual problem of ethics” (Guba & Lincoln, 1981. p. 378). Reliability, validity and generalisability are seen as possible limitations of qualitative research (Hamel, 1998 as cited in Merriam, 2009, p. 52). However, many advocates of qualitative research such as Creswell (2009), Berg (2009), Mathison (1988), and Merriam (2009), counter this argument by advocating the use of multiple sources. Furthermore, through the use of thick descriptions, the voice of the participants and a trail of evidence created by the researcher, the reader is left to decide what is applicable to their context and, thus, what may be generalised and applicable to other cases (Punch, 1998; Erickson, 1986; Henning et al., 2009).

The case study sample of teachers was drawn from the large group that formed the sample for the teacher belief survey (see Section 3.4.2.2 and Section 3.4.3.1 for details regarding the selection of these teachers). Section 3.2 details the similarities between the large-scale sample and the case study group, particularly in terms of the work experience, nationalities and qualifications. Thus, this case study group may be regarded as generally representative of the larger group of teachers.

3.5.2.2 Interviews with Teachers

Interviews with the 15 case study teachers were used to provide insights into the teachers' knowledge, understanding and perspectives of the reform to teaching that was underway. These conversations provided a subjective reality that was guided and managed by the researcher, as described below (Henning et al., 2009).

All of the interviews were in-depth and semi-structured (Henning et al., 2009; Yin, 2011), and the dialogue was steered with the use of an interview guide containing open-ended questions to ensure that the conversation stayed on track. (A copy of the interview guide can be found at Appendix 6.) The interview guide was not used in any particular order but was referred to during the interview (Yin, 2011). I also used cues in the conversation to probe for depth and clarity; for instance: '*Tell me more*'; '*How did that make you feel?*'; '*What is YOUR understanding?*' In keeping with a conversation, participants were given the opportunity to ask questions, so that the interviews were dialogic, with the participants treated as co-owners or research partners of the process rather than as subjects answering questions posed by an authority (Henning et al., 2009; Yin, 2011).

The case study teachers ($n=15$) were first interviewed before the lesson observations, and were asked to describe the objectives and outcomes that they had planned for the lesson. The purpose of these interviews was to gain information about the teacher's preparation and planning of lesson objectives and activities, their beliefs and understanding of their role in the classroom, their philosophy of learning, their perspectives on the use of collaboration and pedagogy and their perception of classroom environment.

The teachers' responses to the TBS were generally used as a starting point for conversation, as it served as a foundation for comparison of the survey results, the teacher's beliefs and their actual practice. The interviews allowed the teachers an opportunity to clarify and give reasons for their classroom practice, which afforded me insight into the educational understandings that they held. These pre-lesson interviews took place in a private room and ranged in length from 35 minutes to one hour.

A second interview was held after each observation. These ranged from 20 to 45 minutes and served as a means of clarifying what I had observed in the lesson and what the teacher had stated prior to the lesson. Teachers were questioned about the strategies that they had used during the lesson, and were asked to explain the differences that I had observed between the pre-lesson observation interviews and their practice. They were also asked to comment on differences between their TBS responses and the observed practice, and were invited to share their reflections on the lesson in the light of their planned objectives and outcomes for the lesson. As such the interview provided an opportunity for the teacher to explain deviations from what he/she had planned to what had actually transpired during the lesson.

All interviews were audio-recorded and transcribed verbatim within a few days of the interview by the researcher, as recommended by Henning et al. (2009). All interviews were stored as MP3 files together with the relevant photographic data.

3.5.2.3 Lesson Observations

Lesson observations were conducted immediately after the pre-observation interview. The observations afforded me an opportunity to examine the classroom practice of the teacher and their understanding of their role as a teacher in the classroom. These observations were used to examine the pedagogical practices of the teachers, their use of group work/collaboration, differentiation and assessment practices.

A recording sheet for lesson observations was developed for the purpose of the study. This checklist ensured a standardised observation recording of the observed

lessons. The scales developed for the TBS guided the categories used for the observations in the lesson observation tool and included the role of the teacher, philosophy of learning and pedagogy, classroom physical environment, reflection, time and feedback. This was done to assist in comparing the teachers' TBS results with classroom practice. Table 3.3 provides a list of the categories of the observation checklist, the number of observable items in each category and an example of an observable item in each category.

Table 3.3 Categories for Lesson Observation Checklist with Examples

| Categories | Example of an observable item |
|---|--|
| Role of the teacher (5 observable items) | Teacher instructing, delivering information versus teacher facilitating, supporting, guiding students – individuals or groups. |
| Philosophy of learning and pedagogy (10 observable items) | Replication of teacher-talk, textbook and white board versus students constructing own knowledge/questioning and forming own views/ideas; interaction of students. |
| Classroom physical environment (6 observable items) | Few materials on classroom walls versus print rich, stimulating environment. |
| Reflection (3 observable items) | Students accept teacher's views and statements versus students question and reflect before accepting teacher or other's view/statements. |
| Time (3 observable items) | Activities stopped when students become restless and then teacher give answers versus all students have time to reflect and complete activities. |
| Feedback (1 observable item) | Simple feedback e.g. 'excellent', 'well done', irrespective if this is true or not. Verbal/written directed at some students versus relevant, constructive, clearly guiding students and giving direction for improvement. Meaningful feedback. Peer assessment. |

The lesson observation-recording sheet was not a traditional checklist but afforded the observer the opportunity to mark along a continuum how traditional or constructivist the practice observed was. Traditional pedagogical statements were placed down the left-hand side of the page and constructivist statements placed opposite on the right. A continuum divided-line was centred between these two opposite statements. This continuum afforded me the opportunity to illustrate how

far towards or away from the stated practice the actual practice was observed to be. A clock was placed next to those statements where time was a factor; for instance, a teacher might be instructing, but only for five minutes, and the rest of the lesson was facilitating and supporting students. This would not be marked as purely traditional pedagogy as would likely occur if a checklist approach had been used. The observer shaded the clock indicating the length of time spent in that mode by the teacher or students. Figure 3.4 provides an illustration of a category of the observation-recording sheet. A copy of this observation sheet can be found in Appendix 7. All observations were recorded using the observation checklist and as field notes which were recorded in a journal.

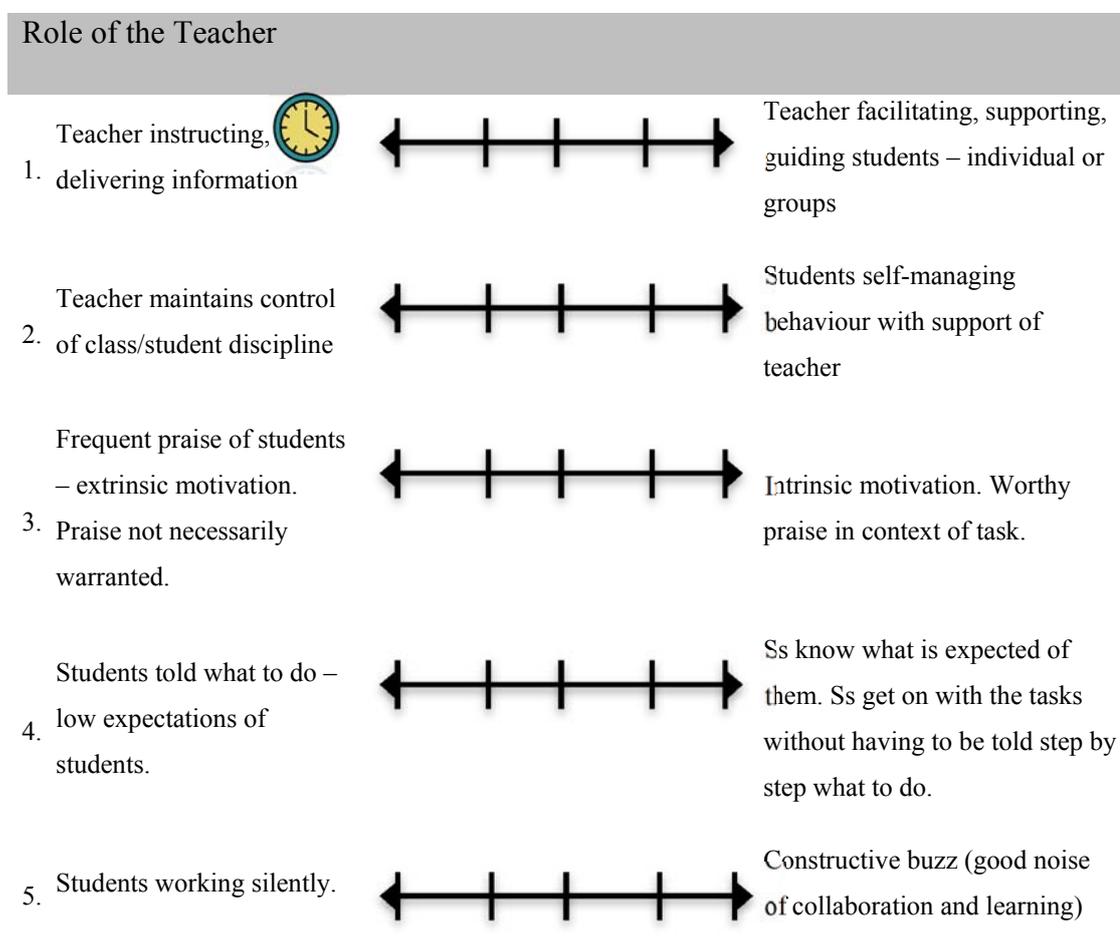


Figure 3.4 Extract of Lesson Observation Sheet

3.5.2.4 Interviews with Members of the Expert Panel

On the scheduled day of the lesson observations, when possible, interviews were held with members of the expert panel after the lesson observations and teacher

interviews had been completed. Five of these interviews took place with education advisers. These interviews added validity to my observations and deductions and contributed greater depth, clarity and insight into the phenomena being researched. As with the interviews with the teachers, these interviews were audio-recorded and transcribed within a few days of the interview, and were stored as MP3 files.

3.6 Data Analysis

The data analysis is discussed according to the research questions. Section 3.6.1 describes the analysis carried out to provide evidence of the validation and reliability of the survey instruments (Research Objectives 1 and 2). Section 3.6.2 describes the analysis used to examine the teachers' views as to their implementation of the curriculum initiatives and whether there was a relationship between teachers' beliefs and students' perceptions of their classroom practice (Research Objectives 3 and 4). Section 3.6.3 examines the factors influencing teachers in implementing constructivist practices into classroom practice (Research Objectives 5 and 6).

3.6.1 Validation of the Questionnaires (Research Objectives 1 and 2)

Analysis of the data collected for teachers ($N=198$) and students ($N=387$) was used to provide evidence of the reliability and validity of the TBS and COLES (Research Objectives 1 and 2). The validation of the two instruments was guided by Trochim and Donnelly's (2006) framework for construct validity, depicted in Figure 3.5. Trochim defines construct validity as "the degree to which inferences can legitimately be made from the operationalisation in your study to the theoretical constructs on which these operationalisation were based" (Trochim, 2006, p. 1). According to the framework pictured in Figure 3.5, a construct should fulfil validity requirements for both translation and criteria.

Translation validity focuses on the accuracy of the translation of the construct from the theory into operation (Trochim, 2006). There are two elements of translation validity: content validity and face validity. Details of how these were examined are described below.

Given that the COLES was a pre-existing and validated survey, as described earlier, the content validity was examined only for the TBS. Evidence of content validity for the TBS was provided, first, by ensuring the construction of scales was based on a sound theoretical representation, and, second, through the use of an expert panel who examined items to ensure items had clear interpretations and were true to the theory upon which they were based. Face validity refers to the clarity of interpretation of the items by the participants and content validity refers to how sound the items are with respect to the theory upon which they are based.

The face validity of TBS and COLES were examined during pilot tests (described in Section 3.4.1 and Section 3.5.2), which involved teachers and students, respectively. Analysis of data collected during interviews with participants during the pilot tests was made to ensure that the items were interpreted in ways that were intended by the researcher.

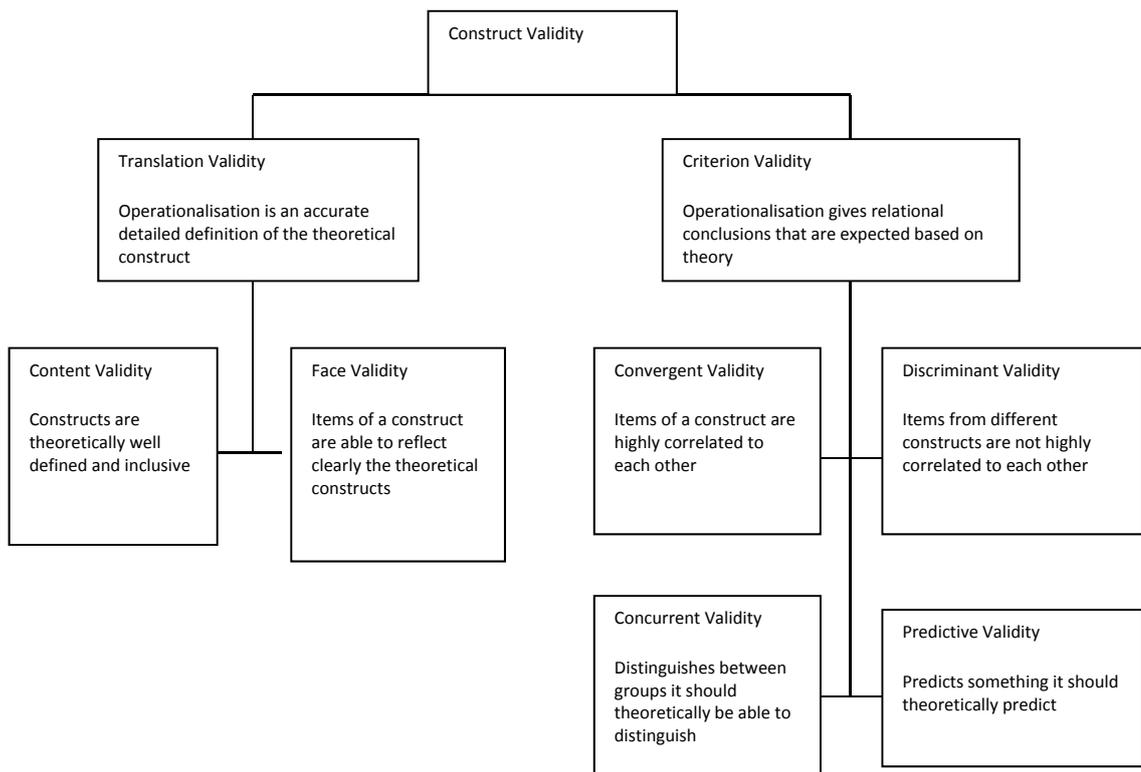


Figure 3.5 Framework for Construct Validity (Source: Trochim & Donnelly, 2006)

Criterion validity refers to the performance of the instrument based on the theory; that is, whether it is able to predict what it should (predictive validity) and

distinguish theoretically between groups (concurrent validity) (Trochim, 2006). Examining the criterion validity of the two instruments involved examining the factor structure, internal consistency reliability, discriminant validity, and ability to differentiate between the perceptions of teachers in different schools and students in different classes. Details of how these were examined are described below.

Principal axis factor analysis was conducted separately for each of the instruments, TBS and COLES. Varimax rotation was used, because with most data involving humans, the factors are expected to be related (Field, 2009) and, therefore, the extraction of pertinent sets of factors is more likely. Varimax rotation in exploratory factor analysis gives a realistic representation of the interrelationship between factors. The factor loadings indicated how strongly each item related to a particular scale, with eigenvalues showing the relative importance of each scale. Cumulative variance was used to show whether sufficient items had been retained in each scale. The Cronbach alpha coefficient was used to provide an indication of the internal consistency reliability for each scale. The factor loadings and internal consistency reliability measure were used to provide evidence of the convergent validity of the instruments.

Field (2009) posits that there should be a moderately strong relationship between factors; however, factor correlations over 0.80 indicate overlapping of concepts and therefore, poor discriminant validity (Brown, 2006). Discriminant validity is achieved when correlations between items in the same scale are higher than with items in different scales. A scale that possesses discriminant validity measures a unique dimension not measured by any other scale in the questionnaire. Therefore, an estimate of the discriminant validity of each scale was derived, using the mean magnitude of the correlation of a scale with the other scales in the same instrument as a convenient index. The discriminant validity of TBS and COLES was examined using a mean correlation of scale with other scales using varimax rotation.

Concurrent validity was assessed to ensure that each scale was able to distinguish between the groups as theoretically expected. Given the unique nature of classrooms, one may assume that students in the same class might view the learning environment in similar ways, but differently to students in another class. For the COLES,

therefore, it was important to examine whether the scales could distinguish between the classes of the teachers and, for the TBS, between the teachers in different schools. Analysis of variance (ANOVA), a statistical model used to analyse the differences among group means and their associated procedures (such as variation among and between groups) was used to investigate the ability of each instrument to differentiate between groups. The η^2 statistic was calculated to show the amount of variance attributed to each group.

3.6.2 Teachers' Views of their Implementation of Constructivist Practice (Research Objective 3)

Descriptive analysis based on the teachers' responses to the TBS was used to describe the views of the teachers with respect to their implementation of constructivist practice in the classroom. As a first step, the average item mean and average item standard deviation was calculated for each scale of the TBS. The average item means were then used to generate a profile for the group as a whole. Using the average item mean provides a meaningful score when there are a different number of items in a scale. In addition, profiles could be drawn to correspond to the response scale of Almost Always, Sometimes and Almost Never.

As a second step, a box and whiskers plot was generated, using SPSS version 20, for each scale of the TBS. The box and whiskers plot provides a visual representation of the variation between the responses of different teachers to scales of the TBS. For the box and whiskers, the length of the box represented 50 per cent of cases and the protruding whiskers, which go out to the smallest and largest values, represent 25 per cent of teachers' responses each. The line across the middle of the box represents the median score for that scale.

The descriptive analysis was used to provide an overview of teachers' responses to the items in each of the scales. This was also used as an indication of the extent to which the teachers' views reflected those of the larger sample.

3.6.3 *Relationship between Teachers' Beliefs and the Learning Environment* **(Research Objective 4).**

To examine the relationships between the teachers' beliefs (as reported in the TBS) and students' perceptions of constructivist-oriented elements of the learning environment (as measured using the COLES), simple correlation and multiple regression analysis, with the class mean as the unit of analysis, were used. Simple correlations were used to examine the bivariate relationship between each teacher belief scale with each learning environment scale. Multiple regression analysis was carried out to investigate the joint influence of the whole set of teacher belief scales on each learning environment scale, as well as which teacher belief scale contributed most to variance in students' perceptions of the learning environment when other belief scales were mutually controlled.

3.6.4 *Examining the Translation of Constructivist Pedagogy into Practice* **(Research Objective 5)**

To represent the lesson observations, a narrative was created. This was based, in particular, on a case study teacher who was deemed to be excellent and doing what was required by the reform. This observation provided similar evidence to other lesson observations. The information was "restored into a narrative (that) combines views from the participants' life with those of the researchers in a collaborative narrative" (Creswell, 2009, p. 13). The narrative "provides a skeletal frame for analysis that leads into interpretation" (Merriam, 2009, p. 255).

The narrative provides a general description, which, according to Merriam (2009) "is needed to tell the reader whether the vignettes and quotes (provided) are typical of the data as a whole" (Merriam, 2009, p. 255). Further, the commentary that follows the narrative "stimulates the retrospective interpretation of the reader" (Erickson, 1986, p. 152).

The narrative provided the opportunity to employ two of the five researcher skills deemed by Yin (2011) to be essential in conducting good research. These are: that the researcher has the ability to listen, include observation and sensing in

assimilating information without bias and to show an “understanding of the issues being studied in order not merely to record data but to interpret” (Berg, 2009, p. 323).

3.6.4 Factors Influencing Teachers’ Implementation of Constructivist Practices

The qualitative data obtained through the case study interviews and lesson observations was also used to examine the factors influencing teachers in their implementation of constructivist practices in the classroom (Research Objectives 5 and 6).

The process for the analysis of the qualitative data for these research objectives followed a process of disassembly and reassembly as described by Yin (2011) and Henning, van Rensburg, and Smit (2009), and illustrated in the flow diagram in Figure 3.6. Although Figure 3.6 reflects a linear process, it was in fact an “on-going, emerging and iterative or non-linear process” (Henning et al., 2009, p. 127). Henning et al. (2009), Berg (2009) and Merriam (2009) emphasise the importance of beginning the analysis as an “inductive and comparative” process rather than a deductive one (which came later in the analysis process).

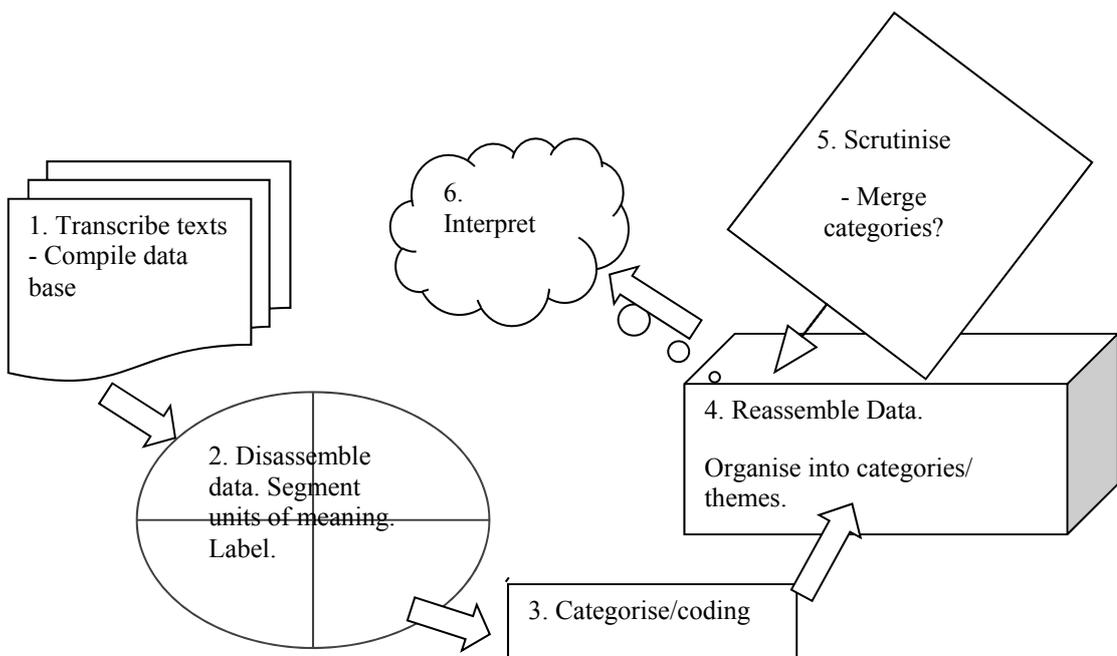


Figure 3.6 Qualitative Process: Adapted From Henning et al. (2009, p. 127) and Yin (2011, p. 206)

This section describes each of the stages depicted in Figure 3.6: transcribe texts and compile data base (Section 3.6.4.1), disassemble data and category coding (Section 3.6.4.2), scrutinise, reassemble and scrutinise again (Section 3.6.4.3) and interpret (Section 3.6.4.4).

3.6.4.1 Transcribe Texts and Compile Data Base

Having recorded the interviews, as described in Section 3.5.3.2, I transcribed them verbatim, then read and re-read the transcriptions in conjunction with field notes. Paper copies of the transcriptions and field notes were used to start the process of disassembly, in which coloured pens and highlighters were used to mark emerging themes. Further, comments and notes were made on these paper copies. The responses were then tabulated using an excel spreadsheet under headings that corresponded to this initial compilation and to the questions asked during the interview process.

3.6.4.2 Disassembly of Data and Categorising/Coding

In re-reading the interviews and through the process of coding, the data was reduced and transformed to make it more accessible and understandable. This allowed me to draw out appropriate themes and patterns (Berg, 2009). The data was coded into categories through a process of “breaking data down into bits of information and then assigning these bits to categories” (Merriam, 2009, p. 177). Thirty categories emerged during this state, each corresponding, largely, to the topics that arose during the interviews. This initial process led to a “thin description of a set of empirical items” (Henning et al., 2009, p. 102) that allowed me to report individual statements and to gain a better understanding of the teachers’ statements. Analysis at this stage did not take into account my views or opinions (Yin, 2011, p. 194). This data was then further investigated and, as a result, merged into 22 categories (see Appendix 8 for an example of this stage of analysis). A spreadsheet was used to collate the data into a matrix that helped in ordering the information into categories that made it simpler to compare (Yin, 2011, p. 193). During this stage the data was analysed inductively and not through the use of prior categories (Cohen, Manion, & Morrison, 2009).

3.6.4.3 *Scrutinise, Reassemble, Scrutinise*

Each of these 22 categories was then re-examined for similarities and dissimilarities (Yin, 2011), forcing me to think “beyond the particular bit of information” (Merriam, 2009, p. 177). This stage involved a more heuristic manner (Lincoln and Guba, 1985). By looking for recurring aspects and meaning in the data and through comparisons with the interview and observation data, the categories were refined and built to “define conceptual similarities and to discover patterns” (Henning et al., 2009, p. 127). The data placed in common categories was quantified into percentages to assist in creating a clearer picture of the teachers’ responses to particular topics. These findings were graphed and used to help report the findings in Chapter 5.

3.6.4.4 *Interpreting*

The number of responses for each of the themes and sub-themes was then quantified to provide a visual representation and assist with the interpretation. Thick descriptions were used in presenting and interpreting the data (Cohen, et al., 2009) to convey meaning and help to justify the interpretations.

3.6.5 *Ensuring the Validity of Phase 2*

Qualitative research involves information about human beings whose behaviour is not static (Merriam, 2009), thus making a replication of the study difficult, often challenging the validity and reliability of the research. According to Merriam (2009), the concepts of credibility, transferability, dependability and confirmability are the qualitative substitutes for the research term, internal validity. Further, the concepts of reliability and objectivity are widely accepted in place of the term external validity. This section reports how the validity of this study was addressed in terms of the internal validity (Section 3.6.5.1) and the external validity (Section 3.6.5.2).

3.6.5.1 *Internal Validity*

Merriam (2009, p. 213) posed three questions that can be used to guide the assessment of a credible study:

1. How congruent are the findings with reality?
2. Do the findings capture what is really there?
3. Are the investigators observing or measuring what they think they are measuring?

Researchers acknowledge that qualitative studies rely heavily upon the sensitivity, bias, perspective and integrity of the researcher, who may often be alone in the natural setting. This can bring into question issues of reliability and validity (Creswell, 2009; Henning et al., 2009; Merriam, 2009; Yin, 2011). In my study I addressed the question of internal validity in a number of ways, including:

1. Prolonged contact with the participants;
2. Member checks;
3. The use of participant observations conducted in the natural setting;
4. The incorporation of the researcher's reflections, introspections, self monitoring and disciplined subjectivity.

These four factors, suggested by LeCompte and Preissle (1993), were used to guide the description of internal validation that follows and at the same time address the questions posed by Merriam (2009).

3.6.5.2 Prolonged contact with the participants

At the time of formulating this study I had spent five years in the field prior to data collection and had an in-depth understanding of the phenomena being studied (Creswell, 2009; Yin, 2011), through working closely with teachers in the schools. It can be said that I was living among the participants and thus, had a good understanding of the schools and the teachers' practice. I was accepted by the teachers and not regarded as an outsider when doing the data collection. Having developed a trusting relationship with the teachers, I anticipated that they would be open and honest with me.

3.6.5.3 *Member checks*

Merriam (2009) refers to informant interviews or member checks, a means of “ruling out the possibility of misinterpreting the meaning of what participants say and do and the perspective they have on what is going on” (Merriam, 2009, p. 217). Throughout the research processes I used an expert panel of education adviser colleagues as a means of member checking. The inclusion of education advisers for member checking and peer review helped to guard against bias by the researcher. Three education advisers were interviewed (unrecorded) with reference to the accuracy of the transcriptions, interpretations of lesson observation records, coding and the final categories that had been formulated. These sessions were held separately and were each conducted over a three to five hour period.

Member checks were used to clarify my understandings and to allay personal bias in interpreting the data, especially the interviews. On some occasions the education advisers accompanied me during the lesson observations. I was thus able to check my understanding and deductions with them for further clarification. Given that the education advisers were working in the individual schools, they had inside information about the realities in the school that helped me in my interpretations. In many cases this information provided me with “data that supported alternative explanations” (Merriam, 2009, p. 219). This member checking also served as an ‘investigator triangulation’, as described by Denzin (1978), where multiple observers assist in clarifying the observation and “offer researchers varied perspectives other than their own” (Berg, 2009, p. 7).

3.6.5.6 *The use of participant observations conducted in the natural setting*

Creswell (2009) notes that some of the common threats to internal validity are the maturation, selection and mortality of participants. No maturation or mortality issues affected the time frames for this research and data collection. While participants for the case study were selected, this selection was mainly governed by their ability to converse in English and thus did not “predispose them to certain outcomes” (Creswell, 2009, p. 163). All research was conducted in the natural setting.

3.6.5.7 *Incorporating researcher's reflections, introspections, self-monitoring and disciplined subjectivity*

Merriam (2009) advises “adequate engagement in data collection [so that] emerging findings must feel saturated” (Merriam, 2009, p. 219). Through my review and reflections of interviews I was able to ascertain that the last six interviews did not reveal any new information, which indicated saturation. I therefore decided that, when a nominated participant could not participate on the scheduled day, this would not be rescheduled, as there was no new information surfacing.

Henning et al. (2009), Merriam (2009) and Yin (2011) stressed that a study should be rigorously conducted. This means, with respect to internal validity, that procedures must be transparent and the researcher should employ a rigorous, orderly routine (Yin, 2011). Throughout the data collection process I maintained a transparent approach through being open with all participants and stakeholders as to the intent and purpose of the research and data collection schedules. I have also done my best to provide transparency throughout reporting the data analysis, each of the steps taken, and how the results came about.

Furthermore, validity is relative because “what is being investigated are peoples’ constructions of reality and how they understand the world” (Merriam, 2009, p. 214). It was therefore important that a methodical approach was followed to deliberately avoid bias or distortion, “adhering to the explicit set of evidence” (Yin, 2011, p. 19).

Yin (2011) defines a valid study as one that has been properly collected and its data carefully interpreted. It is, therefore, up to the researcher to show that this has indeed been so. This craftsmanship involves a process of rigour (Henning et al., 2009; Merriam, 2009; Walter, 2010; Yin, 2011), a term “that reflects that the researcher has ensured that he has faithfully represented the experiences and stories that the people in the natural setting have given” (Walter, 2010, p. 71). Throughout the qualitative data analysis, I have endeavoured to provide a detailed audit trail describing how the data was collected, analysed, categories derived and decisions made during the inquiry (Henning et. al., 2009; Lincoln & Guba, 1985; Merriam, 2009). During the

coding process I consistently checked the data for alternative explanations. This process was also used when the member checking was done (Merriam, 2009).

I am confident therefore, that the findings are congruent with the reality, captured what was really there and consistently measured what I needed to measure for the research objectives that guided my study.

3.7 Ethical Considerations

Educational research involves people who, as the focus of the research, have rights of privacy and welfare that need to be protected (Berg, 2009). While there were professional and organisational codes of conduct and ethics, all of which were met, the responsibility for ethical research, as noted by Anderson (1998) is in the hands of the researcher.

In addition to permission being obtained from the research department of ADEC (see Appendix 9 for the letter of permission and Appendix 11 for ADEC Education Director's consent) and ethics approval given by Curtin University (see Appendix 10,), ethical considerations were observed throughout this study, including confidentiality and maintaining anonymity (Section 3.7.1), power relationships (Section 3.7.2), participation and consent (Section 3.7.3) and the impact on the participants (Section 3.7.4).

3.7.1 Confidentiality and Maintaining Anonymity

At all stages of the research process, the impact on the participants was considered. In particular, the confidentiality of participating teachers was considered. First, the large-scale survey had no means of identifying individual teachers (apart from those who participated in the case study). The surveys by the case study teachers were handed to me prior to their interview. I made identification marks on these for the purpose of analysis of the case study data.

Second, for the collection of qualitative information, the confidentiality and anonymity of individuals was considered. For the reporting of all qualitative

findings, pseudonyms were allocated to participants so that their participation remained confidential. This list resides solely with me and is kept separately from all data. All identifying marks have been removed from the raw data.

Further, because of the sensitivity of Arab culture to photography (and thus being able to identify girl students) photographs were manipulated so that no girl students could be identified from the photographic evidence used in this study.

3.7.2 Addressing Power Relationships

Prior to the commencement of fieldwork, ethical issues related to power relationships were considered and resolved. Anderson (2001, pp. 19-20) warns against an overt request for volunteers, stressing in particular that:

- people most likely to volunteer tend to be the powerless in society and therefore, may often be looking up to the researcher as a person in a position of power;
- people may join the study because of peer pressure;
- people joining may have the expectation that they may be helped or receive preferential treatment.

To guard against these problems, prospective case study participants were identified by and recommended for participation by education advisers. In this study the issues concerning power relationships were considered carefully because, in a reform effort such as the one taking place in ADEC schools, prospective participants may become involved in the belief that they may be helped, or receive preferential treatment in the organisation. Participants were, therefore, made aware that the researcher was not acting on behalf of any party and that she was not in a position to resolve problems or issues. Furthermore, it was explained to the participants that there would be no personal gain or profit either for myself, or for participants, through this research.

3.7.3 Participation and Consent

The ethical protocol was developed prior to commencing the research. Informed consent forms were provided prior to the collection of data. Information pertaining to the research was relayed to the school principals and teachers, together with a formal letter from the Education Director of ADEC in Arabic. Case study participants were given the opportunity to read through the information sheets, which were also verbally explained to ensure understanding. Information provided to participants included the nature and implications of the study, that their participation was voluntary and that they could, if they wished, withdraw at any time. Further, participants were assured their identities would remain confidential. All participants had opportunities to ask questions and to seek clarification prior to the collection of data.

3.7.4 Impact on participants

Given that no research should have an adverse impact on the lives of the participants, an important consideration for this study was the impact of the research process on the participants' lives. To avoid unnecessary inconvenience for the participants, interviews were scheduled during the normal workday. Requests to change the dates or times allocated for data collection were accommodated. Although in my line of my work (related to assisting with curriculum reform and pedagogical change), I was expected to carry out lesson observations and discussions with the teachers, during data collection I did not deviate from the schedule of questions. Experience had shown me that lesson observations can be stressful for teachers and therefore, I was mindful to assure teachers that the interview and lesson observations were not part of any performance appraisal and to ensure that they were not adversely affected by the research process. This awareness also enabled me to be more sensitive to the feelings, emotions and self-esteem of the participants.

3.8 Chapter Summary

This research is framed by post-positivist and socio-constructivist/interpretivist world-views and is conducted in a natural setting uncontrolled by the researcher. The

research design (explained in Section 3.2) used a mixed methods approach because it is reputed that more meaningful insights of the social phenomena are attained through a wide range of interconnected methods. The mixed methods also allowed triangulation to validate findings of the discovery-oriented research.

The sequential design involved two phases. The first phase involved a large scale collection of quantitative data, and the second phase involved gathering qualitative information to explain the teachers' beliefs about their practice and the factors influencing their implementation of reform initiatives. Qualitative and quantitative data were analysed and interpreted together before arriving at the conclusions of the study.

The sample was drawn from nine Cycle 2 and common schools (five all-boy and five all-girl schools). The selection of the schools was purposeful in that they were required to be ADEC schools and staffed by Arab teachers that had been involved in the education reform program for the past three years. 270 teachers participated in the large-scale study, 15 teachers were involved in the case study, and 420 students made up the student sample. The large-scale sample for phase 1 involved a wide range of teachers from different subject and grades. In phase 2 of the study, qualitative information was gathered from 15 case study teachers selected from the same nine schools that formed the quantitative sample. The case study sample was representative of the larger sample, which allowed inferences and interpretations from the smaller to the larger to be made. The case study sample was purposefully selected in so far as only teachers of English were included but randomly selected from within that group. The COLES was administered to 420 students from 18 intact classes of the case study teachers, representing a range of classes from grade 6 to grade 12. A total of 387 surveys was considered to be usable. Students were mainly Arab speaking Emiratis.

In phase 1, two surveys were administered: one to assess teachers' beliefs about their role in the classroom, their learning and knowledge acquisition and their classroom practice ($N=198$), and the other to assess students' perceptions of the learning environment ($N=420$). The survey administered to teachers was developed for the purpose of this study. Development of the instrument involved four stages: the first

stage involved the identification and development of salient scales related to teachers' beliefs about their roles and classroom practice; the second stage involved writing items for each of the scales that were delineated; the third stage involved the translation of the TBS into Arabic; and the fourth stage involved field-testing the newly developed instrument with 20 teachers.

The new instrument named the Teacher Belief Scale (TBS) consisted of five scales with nine to thirteen items in each: the role of the teacher; teacher's philosophy of learning and knowledge acquisition in the classroom; choice of delivery (pedagogy); collaboration; physical environment; and assessment. These were responded to using a five-point frequency response format of Almost Never, Seldom, Sometimes, Often and Almost Always.

The survey administered to students was modified from an existing survey known as the Constructivist Oriented Learning Environment Scale (COLES). The modified version of the COLES was used to assess the extent to which students perceived the teachers to be using pedagogical practices that were constructivist-oriented. The COLES was made up of ten scales: teacher support, equity, young adult ethos, formative assessment, clarity of assessment criteria, involvement, task focus (task orientation), personal relevance, cooperation and individualisation (differentiation). Each of the 81 items was responded to using a five-point frequency response-format of Almost Never, Seldom, Sometimes, Often and Almost Always.

Both the TBS and COLES were translated into Arabic, involving a process of back translation. During this process, the English version was translated into Arabic by a colleague and then back translated by a second colleague who had no knowledge of the survey. Discrepancies between the two versions were discussed with the translators and changes made to ensure equivalence in the two versions.

Qualitative information was gathered using interviews and classroom observations. Individual in-depth, semi-structured interviews were conducted with each of the 15 case study teachers prior to and after each lesson observation. Interviews were audio-recorded and transcribed verbatim within a few days of the interview by the researcher. Non-participant lesson observations were held with each teacher. These

were recorded using an observation checklist (designed for this study) and field notes. Observations allowed the opportunity to examine the classroom practice of the teacher and question their understanding of their role as a teacher in the classroom. These observations were used to examine the pedagogical practices of the teachers, their use of group work/collaboration, differentiation and assessment practices.

An expert panel of five education advisers assisted in the scheduling of interviews, data collection and clarification of the field situations and interpretations. When possible, interviews were held with members of the expert panel after the lesson observations and teacher interviews had been completed. These interviews added validity to my observations and deductions and contributed greater depth, clarity and insight into the phenomena being researched.

The analysis of the data involved a number of steps each corresponding to the different research objectives. Analysis of the data for Research Objectives 1 and 2 (validation of the questionnaires) was guided by Trochim and Donnelly's (2006) framework for construct validity. Evidence of content validity for the TBS was provided by ensuring that the construction of scales was based on a sound theoretical representation and through the use of an expert panel who examined items to ensure that they had clear interpretations and were true to the theory upon which they were based. The face validity of TBS and COLES was examined during pilot tests that involved teachers and students separately.

The criterion validity of the two instruments involved examining the factor structure, internal consistency reliability, discriminant validity and ability to differentiate between the perceptions of teachers in different schools and students in different classes. Principal factor analysis was conducted separately for each of the instruments, TBS and COLES. Cumulative variance was used to show whether sufficient items had been retained in each scale. The Cronbach alpha coefficient was used to provide an indication of the internal consistency reliability for each scale. The factor loadings and internal consistency reliability measures were used to provide evidence of the convergent validity of the instruments. The mean magnitude of the correlation of the raw scores on a scale with those for other scales of the TBS was used as a convenient index of the discriminant validity.

To describe teachers' views of their implementation of constructivist practice (Research Objective 3), descriptive analysis based on the teachers' responses to the TBS was used. The average item mean and average item standard deviation was calculated for each scale of the TBS. This was used to generate a profile for the group as a whole. A box and whiskers plot was generated for each scale of the TBS that provided a visual representation of the variation between the responses of different teachers to scales of the TBS. This provided an overview of teachers' views for each of the scales.

To examine the relationships between the teachers' beliefs (as reported in the TBS) and students' perceptions of constructivist-oriented elements of the learning environment (as measured using the COLES), (Research Objective 4), simple correlation and multiple regression analysis, with the class mean as the unit of analysis, were used. Simple correlations were used to examine the bivariate relationship between each teacher belief scale with each learning environment scale. Multiple regression analysis was carried out to investigate the joint influence of the whole set of teacher belief scales on each learning environment scale, as well as which teacher belief scale contributed most to variance in students' perceptions of the learning environment when other belief scales were mutually controlled.

The qualitative data obtained through the case study interviews and lesson observations was also used to examine the factors influencing teachers in their implementation of constructivist practices in the classroom (Research Objectives 5 and 6). A process of disassembly and reassembly was employed for the analysis of the qualitative data. The data was transcribed into a database, disassembled into segmented units of meaning, categorised and coded, reassembled into categories and themes, scrutinised, merged and interpreted. A narrative was created of the lesson observations in order to more fully understand the meaning for the participants and to create a frame for analysis for the reader by creating a general description.

Four factors, suggested by LeCompte and Preissle (1993), were used to guide the internal validation of the qualitative data: prolonged contact with the participants; member checks; the use of participant observations conducted in the natural setting;

and the incorporation of the researcher's reflections, introspections, self-monitoring and disciplined subjectivity.

Throughout the study and its documentation, clear, detailed and in-depth descriptions have been provided so that readers can decide the extent to which findings can be generalised to other areas. I have endeavoured, at each stage, to provide a detailed audit trail describing how the data was collected, analysed, categories derived and decisions made during the inquiry. During the coding process I consistently checked the data for alternative explanations. This process was also used when the member checking was done.

In addition to permission being obtained from the research department of ADEC and ethics approval from Curtin University, ethical considerations were made throughout this study including confidentiality and maintaining anonymity of participants, power relationships, participant consent and the impact on the participants. Responses to the large scale TBS and COLES were anonymous. The identity of the participants in responses to the case study TBS, are only known to me. For the interviews and transcriptions, only I had access to the identity of the persons involved. Pseudonyms have been used throughout the report. All participants were provided with written and oral information about the study and their rights. Participants were not pressured to participate in the research and they were also made aware that there was no personal gain for them in doing so.

Chapter 4 provides a description of the data analysis results for the validation for TBS and COLES, and Chapter 5 provides the data analysis results for phase 2 (the qualitative data component) of this study.

Chapter 4

Analysis and Results: Development and Validation of Instruments

Validity is an overall evaluative judgment of the degree to which empirical evidence and theoretical rationales support the adequacy and appropriateness of interpretations. [Messick, 1995, p. 741]

4.1 Introduction

Following description of the research methods in Chapter 3, this chapter is devoted to describing the results of the first two research questions which sought, first, to develop and validate a survey that could be used to assess teachers' beliefs about teaching and learning and, second, to validate an existing survey used to assess students' perceptions of the learning environment. This chapter reports the results using the following headings:

- Development of the Teacher Beliefs Survey (Section 4.2);
- Description of Teacher Beliefs Survey (Section 4.3);
- Validation of the Teacher Beliefs Survey (section 4.4); and
- Validation of the Constructivist-Oriented Learning Environment Survey (COLES) (Section 4.5)

4.2 Development of the Teacher Beliefs Survey

Chapter 2 provided a review of literature related to teachers' beliefs and how these can impact on education reform efforts. Based on my review of the literature, and following the steps described in Chapter 3, I developed the new Teacher Beliefs Survey. As described in Chapter 3, an in-depth review of the literature related to constructivist and behavioural teaching was carried out to determine how these philosophies differed with respect to classroom practice. This provided a clear understanding of the focus before beginning the construction of the new instrument.

Examination of the literature related to traditional and constructivist philosophies of teaching and learning indicated that a traditional philosophy involves practices and modes of teaching that are bound by the textbook (Adams, 2006). On the other hand, a constructivist/socio-constructivist pedagogy is not considered to be a single unified theory of knowledge or pedagogy but rather, an assumed pedagogy that is developed through the merging of a number of principles. In this respect, constructivist classrooms are widely considered to be those in which there is a focus on learning (rather than performance), with learners as co-constructors of meaning and knowledge, engaged in tasks of implicit worth, and where assessment is regarded as an active part of the learning process (Adams, 2006; Hein, 1991; Saunders, 1992; Tam, 2000; Wheatley, 1991; Yager, 1991). Further, my review found that the constructivist pedagogy does not have a prescribed list of pedagogical strategies but rather, a set of assumptions held within the education community about the pedagogical practices that are expected for a constructivist/socio-constructivist curriculum.

The purpose of the TBS is to indicate whether a teacher's beliefs about teaching are more constructivist or traditional. Therefore, this section is devoted to describing and justifying the inclusion of each of the scales in the new Teacher Beliefs Survey.

My review of the literature led to the emergence of six scales that can be used to distinguish between the classroom practices in the two education philosophies (traditional and constructivist):

- The role of the teacher in the classroom (described in section 4.2.1);
- Teacher's philosophy of learning and knowledge acquisition (described in section 4.2.2);
- Pedagogical approaches – the choice of delivery (described in section 4.2.3);
- The importance of collaboration and social interaction (described in section 4.2.4);
- The physical classroom environment (described in section 4.2.5); and
- The role of assessment in teaching and learning (described in section 4.2.6).

4.2.1 *Role of the Teacher*

In a traditional classroom, students tend to be passive recipients in a process in which the teacher controls discipline and is viewed as the source of information and an autocratic decision maker. Traditional teachers control the student progress and delivery of the syllabus, usually through the use of a textbook (Bichelmeyer & Hsu, 1999; Boghossian, 2006; Richardson, 2003; Taylor, 1990). This approach is also referred to as a transmission style or teacher-centred approach.

In contrast, a constructivist-oriented teacher is expected to provide opportunities for students to be autonomous and to negotiate their understandings with other students (Airasian & Walsh, 1997; Taylor, 1990). The role of the constructivist-oriented teacher has been described as a coach or facilitator of learning, where the locus of control lies with the student (Adams, 2006; Boghossian, 2006; Richardson, 2003; Roelofs & Terwel, 1999). Such an approach is commonly referred to as a student-centred approach. In the constructivist setting, it is the teacher's role to design suitable learning activities to target specific learning outcomes, as opposed to the traditional paradigm in which teachers tend to rely on textbooks and expect students to memorise content (Airasian & Walsh, 1997; Lattuca, 2006; Richardson, 2003; Stoffels, 2005).

The difference in the role of the teacher in these two paradigms is most marked with respect to the involvement and activity of students. In these cases, traditional teaching involves students as passive beings who relinquish authority to the teacher, while constructivist teaching involves more participation, student responsibility and a partnership that involves the teacher as a coach and facilitator. Therefore, the scale named *role of the teacher* was developed to assess the beliefs that teachers have of their role in the classroom with specific reference to their beliefs about authority and control.

4.2.2 *Teacher's Philosophy of Learning and Knowledge Acquisition*

Knowledge, from the traditional viewpoint, usually in the form of facts, is imparted by the teacher to the student who is expected to unquestioningly accept, memorise

and replicate it when required (Bichelmeyer & Hsu, 1999; Boghossian, 2006; Lattuca, 2006; Lieberman & Pointer-Mace, 2008; Rink, 2001; Taylor, 1990). In contrast, the constructivist stand views knowledge as being constructed through active student participation, involving appropriate activities that are guided, coached and facilitated by the teacher (Bichelmeyer & Hsu, 1999; Boghossian, 2006; Davson-Galle, 1999; Lattuca, 2006; Richardson, 2003; Roelofs & Terwel, 1999).

Research demonstrates that the beliefs a teacher holds about how students learn and what constitutes knowledge guide his/her instructional choices and actions (Eisenhart et al, 1988; Fenstermacher, 1979; Luft & Roehrig, 2007; Önen, 2011; Pajares, 1996; Shinde & Karekatti, 2012; Shulman, 1974; Splitter, 2010). Teachers' beliefs about the nature of knowledge and how it is constructed and stored will affect their teaching mode. That is, if a teacher perceives knowledge as facts that must be memorised, then the teacher will expect students to memorise information (Fives & Buehl, 2008; Hofer & Pintrich, 1997; Kang & Wallace, 2005; Nespor, 1985).

Given the different views of how knowledge is either constructed by the learner or consists of facts that need to be memorised, this scale, *teachers' philosophy of learning and knowledge acquisition*, was developed to assess the teachers' views about how students learn and acquire knowledge.

4.2.3 Choice of Delivery (Pedagogy)

Whereas the previous scale assessed teachers' views about knowledge acquisition, this scale provides an indication of the classroom practices that the teachers view as best for promoting learning. As described earlier, traditional teaching holds that learning occurs when learners are passive and they are provided with facts to memorise. In this sense, student participation is not considered to be necessary and is not encouraged (Boghossian, 2006; Taylor, 1990). Within a traditional teaching paradigm, there is "virtually no space for dialectic interplay between student and teacher" (Boghossian, 2006, p. 715). Any interaction between the student and the teacher is seen as a "ping-pong style classroom discussion where a student's response is directed to the teacher who then directs a question to another student" (Lieberman & Pointer-Mace, 2010, p. 84). This pedagogy is often referred to as

chalk 'n' talk, during which there is a strong “reliance on commercially prepared instructional materials such as textbooks” (Stoffels, 2005, p. 534). As such, traditional teaching tends to be largely textbook and lecture driven (Al Shammari, Sharoufi & Yawkey, 2008; Bichelmeyer & Hsu, 1999; Roelofs & Terwel, 1999).

In contrast, constructivist pedagogy relies upon and expects the active participation of students, where they “are given the opportunity to use their developed ideas in a variety of situations, both familiar and novel” (Davson-Galle, 1999, p. 206). The scale, *pedagogy — choice of delivery*, was developed to assess teachers’ choice of pedagogy and the strategies and practices that they incorporate in their teaching as an indication of whether they tended to be more traditional or constructivist in their pedagogical beliefs.

4.2.4 Collaboration

There is a distinct difference between the philosophy of traditional teachers and those who are more constructivist with respect to the use of collaborative activities in the classroom. As discussed previously, a constructivist viewpoint holds that learning is socially constructed, while the traditional view is that learning involves individual memorisation of factual information (during which students are more likely to sit alone and work individually) (Davson-Galle, 1999; Lieberman & Pointer-Mace, 2010; Richardson, 2003; Taylor, 1990). For constructivists, social interaction and social contexts are regarded as critical in shaping an individual’s learning and, as such, learning is mediated by peers, teachers and adults (Airasian & Walsh, 1997; Lattuca, 2006; Rink, 2001).

Constructivist teachers acknowledge that there is not a set body of knowledge to be acquired, but that the “meanings people make may be unique to themselves or their cultures, potentially resulting in as many meanings as there are meaning makers” (Airasian & Walsh, 1977, p. 445). Constructivist teachers’ view learning as socially constructed and, as such, will tend to set up collaborative learning activities in order for students, through interaction with one another, to create knowledge and understanding.

Therefore, this scale, *collaboration*, sought to assess the extent to which teachers' believe that collaborative activities are important for student learning.

4.2.5 *Physical Environment*

Teachers working from a more traditional paradigm are likely to view stimulating classroom walls or notice boards as a distraction to either the teaching or learning. In a traditional classroom students generally sit in rows, separate from one another. My review of the literature indicated that the physical environment of the traditional classroom is given scant description. In a constructivist-oriented classroom, however, it is considered important to create a rich and stimulating classroom environment that promotes experimentation and dialogue (Adams, 2006) and where students' tables are arranged in groups to facilitate discussion and collaborative activities. The Abu Dhabi Education Council was, at the time of writing this thesis, placing a strong emphasis on the need for teachers to provide interactive, stimulating, print-rich classroom environments.

The contrasting approaches to the classroom environment between traditional and constructivist teachers were used to provide an indication of a teacher's beliefs. This scale was developed to assess the teacher's belief as to the use of the *physical environment* (the walls and desk arrangements) for teaching and learning.

4.2.6 *Assessment*

The role of assessment is regarded quite differently in the two education philosophies (traditional and constructivist). A traditional view of assessment is the degree of replication the student can provide of the memorised facts (Adams, 2006; Boghossian, 2006). Correct solutions are recorded and valued, but the perceived incorrect ones are often discounted, with no discussion with students or acceptance of alternate ideas (Taylor, 1990). In this paradigm, assessment is *of* learning and success is synonymous with good grades (Adams, 2006).

Conversely, the constructivist approach views assessment as being not only *of* learning, but also *for* and *as* learning (Earl, 2003). As such, a teacher working from a

constructivist paradigm will use assessment as a diagnostic tool in order to design appropriate activities to further guide the students (Lattuca, 2006). Within the constructivist paradigm, assessment, is regarded as an active process of uncovering and acknowledging shared understanding rather than a measure of repetitive accuracy during which the emphasis is on assessment *for* learning and assessment *as* learning (Adams, 2006). In this regard, the emphasis of assessment is on the learner rather than the performance.

This scale was developed to assess teachers' beliefs as to whether the role of assessment in teaching and learning is to encourage memorisation or to inform teaching and learning.

4.3 Description of the Teacher Beliefs Survey (TBS)

The six scales delineated above formed the Teacher Belief Survey (TBS). There was a total of 63 items, with 11 items each for the role of the teacher scale and philosophy of learning and knowledge acquisition scale, 13 items for the pedagogy – choice of delivery scale, 10 items for the collaboration scale, and nine items each for the physical environment and assessment scales. Table 4.1 provides a description and sample item for each of the six scales. A copy of the English and Arabic wording for individual items of the TBS administered to teachers in Abu Dhabi can be found in Appendix 4.

Although historically, items have been arranged in cyclic or random order to guard against passive responses, more recent research has successfully arranged items in groups and used headers to provide contextual cues (Aldridge, Fraser & Huang, 1999; Aldridge, Fraser, Taylor & Chen, 2000). Therefore, the items in each scale were arranged in groups with a header provided. Each item was responded to by teachers using a five-point frequency-type scale of Almost Never, Seldom, Sometimes, Mostly, Almost Always. A frequency response format was considered to be preferable to either true/false or paired statements, as it would lead to “more accurate data and a more definitive analysis” (Yin, 2011, p. 133).

Table 4.1 Description and Sample Items for Each Teacher Beliefs Survey Scale

| Scale name | No of items | Description | Sample item |
|----------------------------------|-------------|---|---|
| Role of the teacher | 11 | To assess the beliefs teachers have of the expectations of them in their classrooms. | As the teacher it is my role to deliver factual information to students. |
| Teacher's philosophy of learning | 11 | To assess the teachers' philosophy as to what constitutes learning and how students acquire knowledge. | Students learn best when they all complete the same worksheet. |
| Pedagogy – choice of delivery | 13 | To assess teacher beliefs of delivery of teaching and learning in the classroom. | My lessons involve students working on different activities at the same time. |
| Collaboration | 10 | To assess the extent to which teachers believe collaborative activities constitute learning or whether learning is an individual activity only. | In my lessons students collaborate to decide how a task should be approached. |
| Physical environment | 9 | To assess the teachers' beliefs as to the importance of the classroom environment with respect to teaching and learning. | In my classroom all the students have the opportunity to display their work. |
| Assessment | 9 | To assess the teachers' beliefs with respect to the role that assessment plays in teaching and learning. | I use quizzes and tests to establish students' achievement levels. |

Chapter 3 (Section 3.5.2) described the process used to translate the newly-developed TBS into Arabic for use with teachers in Abu Dhabi. The TBS was presented as a dual-language English and Arabic layout in which the Arabic translations were placed directly next to or below the English statements. This layout allowed for the same document to be used for both the English and the Arabic respondents. Figure 4.1 provides a sample of the layout of the TBS and the dual-language presentation.

| Role of the Teacher دور المعلم | | أبداً Never | أحياناً Seldom | بعض الأوقات Sometimes | غالباً Mostly | دائماً Always |
|--------------------------------|---|-------------|----------------|-----------------------|---------------|---------------|
| 1. | As the teacher it is my role to ensure that students work silently. كوني معلّم فِدوري يَقتضي ضمان عمل جميع الطلاب بصمت. | | | | | |
| 2. | As the teacher it is my role to deliver factual information to students. كوني معلّم فِدوري يَقتضي توصيل معلومات حقيقية للطلاب. | | | | | |

Figure 4.1 Dual Language Format Used in the TBS

4.4 Reliability and Validity of the TBS

To provide confidence in the results of the ensuing research questions it was important to first establish the reliability and validity of the questionnaires. This section reports the reliability and validity of the newly-developed TBS in terms of Trochim and Donnelly's (2006) framework for construct validity. The section describes how the TBS fulfilled validity of requirements for both the translation (reported in Section 4.4.1) and criteria (reported in Section 4.4.2).

4.4.1 Translation Validity of the TBS

Translation validity includes both content validity and face validity. By basing the constructs of the survey on sound theoretical underpinnings (described above in Section 4.2), the content validity was assured. In addition, the content validity of the items within each of the scales was checked through intensive consultation with expert panel members (described in Chapter 3, Section 3.4.2.2) throughout the development phase. The expert panel helped to examine the accuracy of the scales and their items in relation to the theory, the descriptions of the scales and the readability, comprehension and understanding of the items.

To establish the face validity and content validity, once the TBS was developed and translated, it was pilot tested with 22 teachers. Face validity refers to whether the items of a scale reflect clearly the theoretical constructs, and content validity refers to

whether the constructs are theoretically well defined and inclusive (Trochim & Donnelly, 2006). The steps taken to ensure each of these are described below.

Forty teachers were invited to participate in the pilot study; twenty-two were accepted (the selection process is described in Chapter 3, Section 3.5.3). The aims of the pilot study were to expose: any Arabic/English translation issues which would affect the participants' interpretation of the item; any problems that may arise with participants' interpretation of the items; aspects of the layout or instructions that may be problematic; and, finally, the time taken to complete a questionnaire.

The pilot test involved teachers responding to the survey and completing a feedback sheet (described in Chapter 3, Section 3.5.3) that was used to comment on individual items and to provide suggestions to the researcher. Given the restrictions on female teachers in male schools in Abu Dhabi, a member of the expert panel assisted me by overseeing the pilot study in the boys' school. The expert panel member also questioned participants to ensure that their understandings were in line with those intended by the researcher.

All of the responses that were recorded on the feedback sheets were positive with respect to the English-Arabic translations. One participant responded that the dual layout English-Arabic "using Arabic side-by-side to English had made it clear and the translation is accurate" (Pilot Teacher S9).

Interviews that I held with four pilot study participants, in conjunction with the feedback from the expert panel member who conducted the pilot test in the male school, indicated that generally teachers understood the items and interpreted them in ways that were similar to the researcher's intent. In two instances, Item 62 and Item 28, respondents were unclear about the intent of the item. For example, Item 62 (Students demonstrate their learning when they provide feedback to their peers) was confusing to some of the teachers. The Arabic translation was amended so that it was clearer. It also emerged that, for some teachers, their understanding was limited because of their poor understanding of the context of the statement within the pedagogical framework. That is, for those teachers who had not been exposed to situations in which students gave feedback to their peers, they were unable to

imagine how a teacher could use this information as an assessment of students' knowledge. For example, item 28 (My lessons involve students working on different activities at the same time) was a concept (as phrased in this statement) that they found to be inconceivable. Close scrutiny of the back translation which read, "In my classes students participate in all activities at the same time", indicated why this was a problem. The Arabic translation was adjusted so that it read the same as the English statement.

Once changes to the problematic items were made based on the results of the pilot test, the survey was administered to the main sample.

4.4.2 Criterion Validity of the TBS

Analysis of the data collected from 198 teachers (the selection of whom is described in Chapter 3) was carried out to examine the criterion-related validity of the TBS, including the: factor structure (reported in Section 4.4.2.1); internal consistency reliability (4.4.2.2); and discriminant validity (reported in Section 4.4.2.3). Each of these steps is described below.

4.4.2.1 Factor Structure of the TBS

As a first step, the factor structure of the newly developed TBS was examined. Using the data collected from the sample of 198 teachers, principle axis factor analysis with varimax rotation was used to check the structure of the 63 item, six-scale TBS (see Table 4.2). The two criteria used for retaining any item were that it must have a factor loading of at least 0.40 on its own scale, and less than 0.40 on any of the other scales (Field, 1992; Thompson, 2004; Stevens, 2005). During the factor analysis, one of the scales, assessment, was omitted, as the items did not meet the criteria. A further 23 items also did not meet the criteria and were omitted from further analysis. Items removed were numbers 1, 4, 5, 6 and 7 of the role of the teachers scale; items 14, 15, 17 of the philosophy of learning scale; items 25, 27, 30 32, 33, 34 and 35 of the choice of delivery scale; items 37, 41 and 44 of the collaborations scale; and items 50, 51 and 52 of the physical environment scale.

Table 4.2 Factor Loadings for the Teaching Belief Survey

| Item No | Factor Loading | | | | |
|------------|---------------------|------------------------|--------------------------------|---------------|----------------------|
| | Role of the teacher | Philosophy of learning | Pedagogy or choice of delivery | Collaboration | Physical environment |
| 2 | 0.60 | | | | |
| 3 | 0.53 | | | | |
| 8 | 0.65 | | | | |
| 9 | 0.51 | | | | |
| 10 | 0.55 | | | | |
| 11 | 0.46 | | | | |
| 12 | 0.43 | 0.53 | | | |
| 13 | | 0.54 | | | |
| 16 | | 0.55 | | | |
| 18 | | 0.63 | | | |
| 19 | | 0.73 | | | |
| 20 | | 0.64 | | | |
| 23 | | | 0.58 | | |
| 24 | | | 0.66 | | |
| 26 | | | 0.41 | | |
| 28 | | | 0.48 | | |
| 29 | | | 0.42 | | |
| 31 | | | 0.48 | | |
| 36 | | | | 0.76 | |
| 38 | | | | 0.69 | |
| 39 | | | | 0.48 | |
| 40 | | | | 0.69 | |
| 42 | | | | 0.52 | |
| 43 | | | | 0.62 | |
| 45 | | | | 0.69 | |
| 46 | | | | | 0.66 |
| 47 | | | | | 0.75 |
| 48 | | | | | 0.70 |
| 49 | | | | | 0.66 |
| 53 | | | | | 0.58 |
| 54 | | | | | 0.45 |
| % Variance | 5.67 | 6.40 | 4.92 | 29.30 | 1.34 |
| Eigenvalue | 1.76 | 1.98 | 1.52 | 9.08 | 3.21 |

Factor loadings smaller than 0.40 have been omitted

N= 198 teachers in 9 schools

The factor loadings for the remaining 31 items, reported in Table 4.2, showed that with the exception of one, all items had a factor loading of at least 0.40 on their own scale and less than 0.40 on the other scales. The exception was for item 12 (philosophy of learning scale), which loaded both on its own scale, teacher's philosophy of learning, and the role of the teacher scale. This item was retained as its removal was found to weaken the scale overall.

The percentage of the total variance, recorded at the bottom of Table 4.2, ranged from 4.92% to 29.30% for different scales, with the total variance accounted for being 56.63%. Eigenvalues ranged from 1.52 to 9.08 for different scales.

4.4.2.2 Internal Consistency Reliability of the TBS

It is important that items within a scale assess the same construct. A widely-used method for assessing the reliability of questionnaires is the alpha coefficient, developed by Cronbach (1951) to measure the internal consistency or reliability of a scale for a particular sample. Alpha coefficients range in value from 0 (inconsistent) to 1 (perfectly consistent), and can be used to describe the reliability of factors extracted from questionnaires that involve rating scales. The higher the coefficient, the more reliable the generated scale is, and it is widely accepted that an alpha coefficient of 0.70 is acceptable (Nunnally, 1978).

For the revised 31-item version of the TBS, the internal consistency reliability was generated for each scale. The scale reliability estimates, reported in Table 4.3, ranged from 0.71 to 0.83 for the five TBS scales. The relatively high alpha reliability for each scale (the lowest of which was 0.71 for the choice of delivery scale) suggest that the items in a scale assessed a common concept and meet the conventionally accepted cut-off point of 0.70 for satisfactory internal consistency. These were considered, therefore, to be acceptable.

Table 4.3 Internal Consistency Reliability (Cronbach Alpha Coefficient)

| Scale | No of Items | Alpha Reliability |
|------------------------|-------------|-------------------|
| Role of the Teacher | 6 | 0.76 |
| Philosophy of Learning | 6 | 0.78 |
| Choice of Delivery | 6 | 0.71 |
| Collaboration | 7 | 0.83 |
| Physical Environment | 6 | 0.73 |

The sample consisted of 198 teachers in 9 schools.

4.4.2.3 Discriminant Validity of the TBS

The discriminant validity assesses the extent to which a scale is unique in the dimension it covers (that is, the concept is not included in another scale in the instrument). The mean magnitude of the correlation of the raw scores on a scale with those for other scales of the TBS was used as a convenient index of the discriminant validity. Table 4.4 reports that the mean correlation of a scale with the other scales varied between 0.29 and 0.44. Mean correlations indicated that there was a degree of overlap between the scales; however, the factor analysis supports the relative independence of the scales.

Table 4.4 Discriminant Validity (Mean Correlation with Other Scales)

| Scale | Mean Correlation |
|------------------------|------------------|
| Role of the Teacher | 0.39 |
| Philosophy of Learning | 0.29 |
| Choice of Delivery | 0.38 |
| Collaboration | 0.44 |
| Physical Environment | 0.36 |

The sample consisted of 198 teachers in 9 schools.

4.4.2.4 Concurrent Validity: Ability to Differentiate between Western and Arabic Teachers

Concurrent validity ensures that an instrument can distinguish between groups that it should theoretically be able to distinguish between. A feature of the study was that Western teachers in Abu Dhabi were more than likely to have been exposed to constructivist philosophy of teaching in their pre-service education, while most Arab teachers had not had pre-service training in education and were therefore unlikely to have been exposed to constructivist philosophy. It was predicated that the scales of the TBS would be able to distinguish between these two groups. A one way analysis of variance (ANOVA) was used to examine whether the TBS scales could differentiate between Western and Arab teachers. The results of the ANOVA, reported in Table 4.5, indicate that all five TBS scales could differentiate with statistical significance ($p < 0.01$) between groups.

Table 4.5 Ability to Differentiate between the Beliefs of Western and Arabic Teachers (ANOVA Results) for the TBS

| Scale | ANOVA Eta ² |
|------------------------|---------------------------|
| Role of the Teacher | 0.04** |
| Philosophy of Learning | 0.16** |
| Choice of Delivery | 0.03** |
| Collaboration | 0.07** |
| Physical Environment | 0.14** |

** $p < 0.01$ * $p < 0.05$

The sample consisted of 178 Arabic Teachers and 20 Western Teachers.

The eta² statistic (which is the ratio of 'between' to 'total' sums of squares) represents the proportion of variance explained by class membership.

4.5 Reliability and Validity of the Learning Environment Survey

Although the reliability of the Constructivist-Oriented Learning Environment Survey (COLES) has been reported for samples in Western Australia and South Africa (see Section 3.5.1.2 of Chapter 3), it had not been used with students in Abu Dhabi. It was important, therefore, to establish its reliability with this group of students. As a first step, the Arabic version of the COLES (the translation process for which is described in Section 3.5.2) was pilot tested with five students to examine the face validity of the individual items described in Section 3.5.3. The pilot study was used to check for any translation issues and to ensure that students were interpreting the items in the way in which they had been intended. With the aid of an Arabic speaking expert panel member, the students were interviewed after completing the survey. The students used the format correctly and no issues emerged with respect to the English-Arabic translation or the students' interpretation of the items.

The data collected from 397 students in 15 classes (the selection of whom is described in Section 3.4.2) was used to examine the reliability and validity of the Arabic version of the COLES in terms of: the factor structure (described in Section 4.5.1); internal consistency reliability (described in Section 4.5.2); and discriminant validity (described in section 4.5.3).

4.5.1 Factor Structure

Using data from 397 students in 15 classes, principal axis factor analysis with varimax rotation and Kaiser normalisation was performed for the 67 items in 11 scales of the Arabic version of COLES. The two criteria for the retention of any item were that it must have a factor loading of at least 0.40 with its own scale and less than 0.40 with all other scales. All items of three of the scales were found to be problematic (these being equity scale, young adult ethos scale, and task orientation scale) and were omitted from all further analysis. All other items were retained, providing a 48-item eight-scale version (6 items per scale).

Table 4.6 reports the factor loadings for individual items and shows that the remaining 48 items all have a factor loading of at least 0.40 on their own scale and less than 0.40 on the other seven scales, with the exceptions of three items: Item 28 for the Formative Assessment scale (which loaded on the Personal Relevance scale as well as its own scale); Item 39 of the Involvement scale; and item 62 of the Differentiation scale (the latter two both loaded on their own scale as well as the Cooperation scale).

The percentage of variance accounted, reported at the bottom of Table 4.6, shows that for different scales, these ranged from 1.02% to 50.67%, with the total being 71.25%. The eigenvalues, also reported at the bottom of Table 4.6, ranged from 1.12 to 24.32 for different scales.

4.5.2 Internal consistency reliability

The internal consistency reliability of each COLES scale was determined using the Cronbach alpha coefficient for two units of analysis (the individual and the class mean). The Cronbach alpha coefficients, reported in Table 4.7, ranged from 0.87 to 0.92 for the individual as the unit of analysis, and from 0.87 to 0.98 for the class mean as the unit of analysis. Given that the lowest coefficient was 0.87 with either the individual or the class mean as the unit of analysis, these can be considered to be high (as suggested by Nunnally, 1978), indicating that the items within each scale of the COLES assess a similar construct.

Table 4.6 Factor Loadings, Percentage Variance and Eigenvalues for the Arabic Version of the COLES

| Item No | Factor Loading | | | | | | | |
|------------|----------------|-----------------|----------------------|--------------------------------|-------------|--------------------|-------------|-----------------|
| | Shared Control | Teacher Support | Formative Assessment | Clarity of Assessment Criteria | Involvement | Personal Relevance | Cooperation | Differentiation |
| 1 | 0.61 | | | | | | | |
| 2 | 0.69 | | | | | | | |
| 3 | 0.72 | | | | | | | |
| 4 | 0.76 | | | | | | | |
| 5 | 0.60 | | | | | | | |
| 6 | 0.61 | | | | | | | |
| 7 | | 0.50 | | | | | | |
| 8 | | 0.70 | | | | | | |
| 9 | | 0.59 | | | | | | |
| 10 | | 0.75 | | | | | | |
| 11 | | 0.46 | | | | | | |
| 12 | | 0.66 | | | | | | |
| 26 | | | 0.51 | | | | | |
| 27 | | | 0.60 | | | | | |
| 28 | | | 0.49 | | | 0.41 | | |
| 29 | | | 0.59 | | | | | |
| 30 | | | 0.47 | | | | | |
| 31 | | | 0.44 | | | | | |
| 32 | | | | 0.54 | | | | |
| 33 | | | | 0.56 | | | | |
| 34 | | | | 0.43 | | | | |
| 35 | | | | 0.44 | | | | |
| 36 | | | | 0.41 | | | | |
| 37 | | | | 0.58 | | | | |
| 38 | | | | | 0.44 | | | |
| 39 | | | | | 0.55 | | 0.43 | |
| 40 | | | | | 0.58 | | | |
| 41 | | | | | 0.53 | | | |
| 42 | | | | | 0.45 | | | |
| 43 | | | | | 0.42 | | | |
| 50 | | | | | | 0.60 | | |
| 51 | | | | | | 0.72 | | |
| 52 | | | | | | 0.67 | | |
| 53 | | | | | | 0.75 | | |
| 54 | | | | | | 0.71 | | |
| 55 | | | | | | 0.62 | | |
| 56 | | | | | | | 0.64 | |
| 57 | | | | | | | 0.66 | |
| 58 | | | | | | | 0.63 | |
| 59 | | | | | | | 0.62 | |
| 60 | | | | | | | 0.52 | |
| 61 | | | | | | | 0.51 | |
| 62 | | | | | | | 0.42 | 0.43 |
| 63 | | | | | | | | 0.47 |
| 64 | | | | | | | | 0.43 |
| 65 | | | | | | | | 0.46 |
| 66 | | | | | | | | 0.43 |
| 67 | | | | | | | | 0.50 |
| % Variance | 3.87 | 2.93 | 2.59 | 1.02 | 2.34 | 50.67 | 5.14 | 1.01 |
| Eigenvalue | 1.85 | 1.41 | 1.24 | 1.89 | 1.12 | 24.32 | 2.47 | 1.84 |

Factor loadings smaller than 0.40 have been omitted.

N= 397 students in 15 classes.

Table 4.7 Internal Consistency Reliability (Cronbach Alpha Coefficient) for Two Units of Analysis for the Arabic Version of the Modified COLES

| Scale | Unit of Analysis | Alpha Reliability |
|-----------------------|------------------|-------------------|
| Shared Control | Individual | 0.87 |
| | Class Mean | 0.87 |
| Teacher Support | Individual | 0.89 |
| | Class Mean | 0.94 |
| Formative Assessment | Individual | 0.91 |
| | Class Mean | 0.98 |
| Clarity of Assessment | Individual | 0.89 |
| | Class Mean | 0.96 |
| Involvement | Individual | 0.89 |
| | Class Mean | 0.94 |
| Personal Relevance | Individual | 0.91 |
| | Class Mean | 0.97 |
| Cooperation | Individual | 0.92 |
| | Class Mean | 0.97 |
| Differentiation | Individual | 0.89 |
| | Class Mean | 0.93 |

The sample consisted of 397 students in 15 classes.

4.5.3 Ability to Differentiate Between Classes

Theoretically, students in the same class should perceive the learning environment in similar ways to each other but differently to each other. To establish whether the COLES was able to differentiate between classrooms, a one-way ANOVA was used, the results for which are reported in Table 4.8. The results were statistically significant ($p < 0.01$) for all eight learning environment scales, indicating that COLES was able to differentiate between classes.

Table 4.8 Ability to Differentiate Between Classrooms (ANOVA Results) for Two Units of Analysis for the Arabic Version of the Modified COLES

| Scale | ANOVA Results (Eta ²) |
|-----------------------|--------------------------------------|
| Shared Control | 0.17** |
| Teacher Support | 0.21** |
| Formative Assessment | 0.19** |
| Clarity of Assessment | 0.16** |
| Involvement | 0.12** |
| Personal Relevance | 0.16** |
| Cooperation | 0.19** |
| Differentiation | 0.18** |

** p<0.01

The sample consisted of 397 students in 17 classes.

The eta² statistic (which is the ratio of 'between' to 'total' sums of squares) represents the proportion of variance explained by class membership.

4.6 Chapter Summary

As no suitable survey existed to assess the extent to which teachers believed their practices to be constructivist, the Teacher Belief Survey was developed and translated into Arabic. The survey was made up of 63 items in the six scales developed, reflecting the very different approaches and practices between traditional and constructivist classrooms. The scales were: role of the teacher in the classroom; philosophy of learning and knowledge acquisition; choice of delivery (pedagogical approaches); physical environment of the classroom; use of collaboration in the classroom; the role of assessment for teaching and learning. Each item was responded to using a five-point frequency-response format of Almost Never, Seldom, Sometimes, Often and Almost Always. The TBS was translated into Arabic and presented as a dual-language survey in which the English and Arabic versions of each item were presented together.

Evidence was provided to support the reliability and validity of the newly developed instrument. A review by the expert panel suggested that the translation validity (content and face validity) was well defined and related to the theoretical constructs from which it was derived. Furthermore, the English-Arabic translation was reported

as being accurate and had not affected the respondents' interpretation of the constructs and the items. Twenty-two teachers accepted the invitation to participate in the pilot study through which translation issues, layout and instructions for the survey were examined. The responses from the pilot study led to a refinement of a few items so that these would be read as intended in the English version.

The criterion-related validity of the TBS was examined. Principle axis factor analysis with varimax rotation resulted in the removal of the assessment scale and a total of 23 items, as these did not meet the factor structure criteria. This left a total of 31 items in five scales. All remaining items loaded at least 0.40 on their own scale and less than 0.40 on the other scales. As indicated, the percentage of the total variance ranged from 4.92% to 29.30% for different scales, with the total variance accounted for at 56.63%. Eigenvalues ranged from 1.52 to 9.08 for different scales.

The scale reliability estimates (Cronbach alpha coefficient) ranged from 0.71 to 0.83 for the five TBS scales. The relatively high alpha reliability for each scale (the lowest of which was 0.71 for the choice of delivery scale) suggests that the items in a scale assessed a common concept and meet the conventionally accepted cut-off point of 0.70 for satisfactory internal consistency reliability.

The mean magnitude of the correlation of the raw scores on a scale with those for other scales of the TBS was used as a convenient index of the discriminant validity. The mean correlation of a scale with the other scales varied between 0.29 and 0.44. Mean correlations indicated that there was a degree of overlap between the scales, however, the factor analysis supports the relative independence of the scales.

A one way analysis of variance (ANOVA) was used to examine whether the TBS scales could differentiate between Western and Arab teachers. The results of the ANOVA indicate that all five TBS scales could differentiate with statistical significance ($p < 0.01$) between groups.

The reliability and validity tests for the Arabic version of the COLES used data from 397 students in 15 classes. Factor structure with principal axis varimax rotation and Kaiser normalisation highlighted problematic items, which were thus omitted leaving

an 8 scale, 48-item version. The percentage of variance for the different scales ranged from 1.02% to 50.67%, with the total being 71.25%. The eigenvalues ranged from 1.12 to 24.32 for different scales.

The internal consistency reliability using Cronbach alpha coefficient for two units of analysis ranged from 0.87 to 0.92 for the individual as the unit of analysis, and from 0.87 to 0.98 for the class mean as the unit of analysis, indicating that the items within each scale of the COLES assess a similar construct. The results of a one-way ANOVA were statistically significant ($p < 0.01$) for all eight learning environment scales, indicating that COLES was able to differentiate between classes.

The evidence, therefore, supports the reliability and validity of both instruments, providing confidence in findings for the other research questions, for which the findings are explained in the next chapter.

Chapter 5

Analysis and Results: Implementing Constructivist Practice

The world is like a Mask dancing. If you want to see it well you do not stand in one place. (Chinua Acheba, 1930)

5.1 Introduction

Chapter 4 was devoted to reporting the development and validation of the questionnaires used in this study (Research Objectives 1 and 2); this chapter reports the results for the remaining research questions and is organised under the following headings:

- Teachers' views of their implementation of constructivist practice (Section 5.2);
- Relationships between teachers' beliefs and practice (Section 5.3);
- Examining the translation of teachers' beliefs into practice (Section 5.4);
- Explaining the incongruence between expected and observed practice (Section 5.5);
- External factors that influence teachers' implementation of constructivist practice (Section 5.6); and
- Chapter summary (Section 5.7).

5.2 Teachers' Views of their Implementation of Constructivist Practice

The aim of research objective 3 was to examine the views that teachers had of their implementation of constructivist practices in the classroom. This section describes only the Arab teachers' views ($N=182$), as these were the teachers upon whom the study focused. This section describes, first, the views of all of the Arab teachers (Section 5.2.1) and, second, the views of the case study teachers (Section 5.2.2).

5.2.1 Teachers' Responses to the TBS (Whole Sample)

To provide an overview of the teachers' responses to the TBS, descriptive statistics, including the average item mean and average item standard deviation, were calculated. These results allowed comparison of scores between scales with different numbers of items. Given that two of the scales, the role of the teacher and the philosophy of learning, assessed more traditional views, the scores for these scales were reversed to provide a more meaningful comparison with the other scales. Table 5.1 reports the average item mean and average item standard deviation for the 182 Arab teachers, and Figure 5.1 provides a graphic profile of these scores.

Table 5.1 Average Item Mean, Average and Item Standard Deviation for the Teacher Belief Survey

| Scale | Average Item Mean | Average Item Standard Deviation |
|------------------------|-------------------|---------------------------------|
| Role of the Teacher | 1.72 | 0.56 |
| Philosophy of Learning | 2.97 | 0.74 |
| Choice of Delivery | 3.29 | 0.60 |
| Collaboration | 3.64 | 0.69 |
| Physical Environment | 3.67 | 0.75 |

N= 182 teachers
 p*<0.05 *p*<0.01

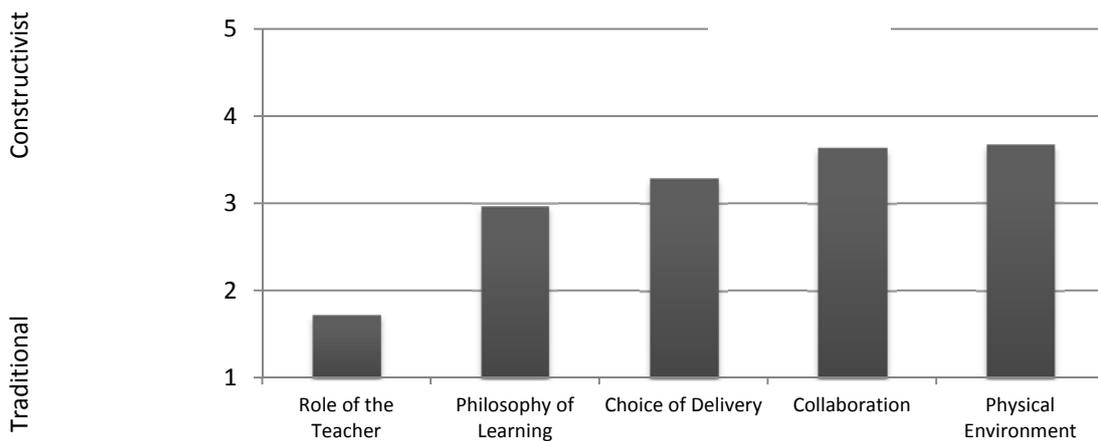


Figure 5.1 Mean Responses to Each Teacher Belief Survey Scale

To provide information about the distribution of teachers' responses to the scales in the TBS, a box plot was generated using SPSS version 20 (see Figure 5.2). In each case, the length of the box represents 50 per cent of the cases, and the line across the inside of the box represents the median value. The 'whiskers', protruding above and below the box, go out to the smallest and largest values for each scale and each represents 25% of teacher responses. An inspection of the variability in scores provides a visual image of the different responses. The lower end of the scale (almost never) is indicative of a more traditional classroom whereas the higher end of the scale (almost always) is indicative of a more constructivist-oriented classroom.

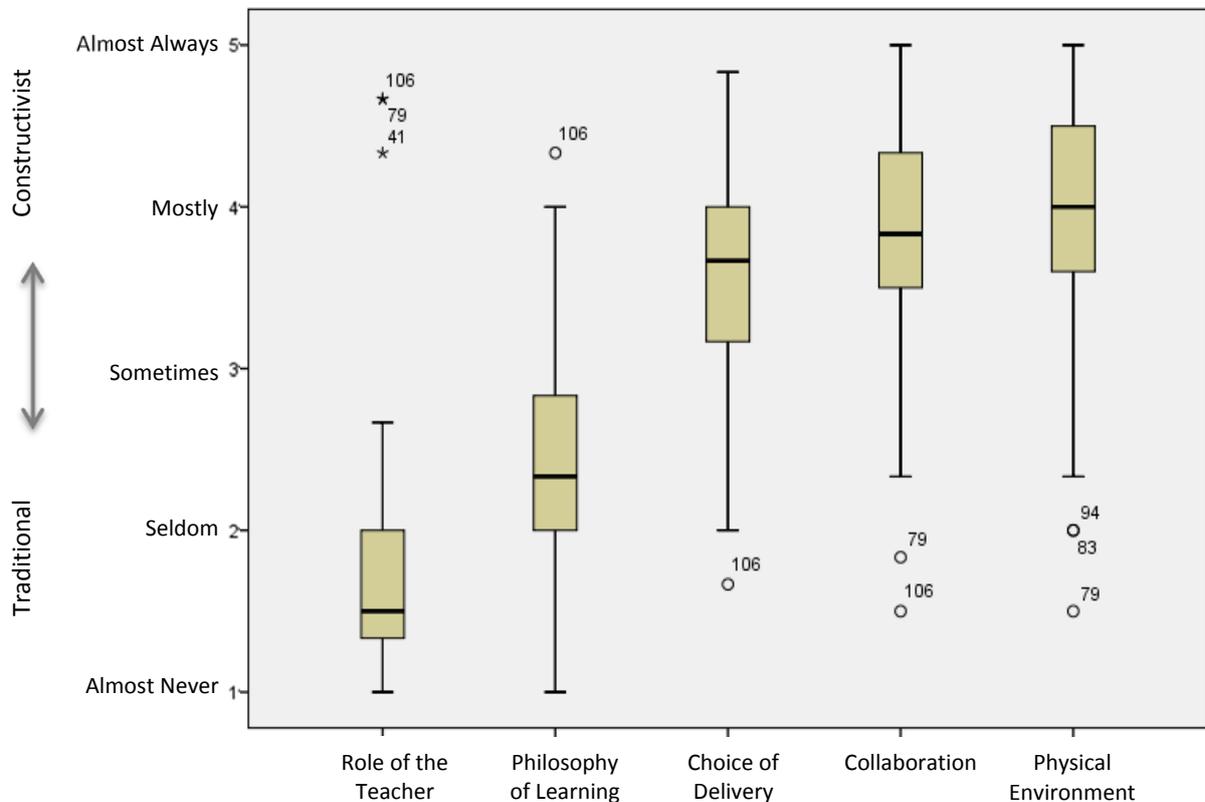


Figure 5.2 Variation in Responses to TBS scales (N=182)

The results, reported in Table 5.1, indicate that the average item mean for the role of the teacher scale is 1.72 (Standard Deviation = 0.56) indicating that teachers' beliefs about this scale were the least constructivist for the five scales. The majority of the responses, as shown in Figure 5.2, for the role of the teacher scale were between 1 (seldom) and 3 (almost never), indicating that the teachers viewed their role to be

more traditional than constructivist in nature. This scale had the smallest range of responses when compared to the other scales.

Teachers' responses to the philosophy of learning scale, which assessed their views about knowledge acquisition, suggested slightly more constructivist beliefs than the previous scale; however, the average item mean (reported in Table 5.1) was 2.97 (Standard Deviation = 0.74), suggesting teachers did not always consider learning in constructivist terms. This scale had the largest range of responses from teachers, as indicated in Figure 5.2, ranging from mostly to almost never. Both this scale and the role of teacher scale (discussed previously), reported more traditional results than the remaining three scales.

The remaining three scales were related to how teachers viewed the implementation of constructivist practices in their classes. The average item mean for the choice of delivery scale was 3.29 (standard deviation = 0.60), 3.64 for the collaboration scale (standard deviation = 0.60) and 3.67 for the physical environment scale (standard deviation = 0.70). These results, on the whole, indicate that teachers viewed their classroom practice to be more constructivist than traditional; that is, they felt that they were generally applying constructivist principles in their classrooms. Although the means for these three scales were relatively high, there was much variation between responses, ranging from seldom to almost always for all scales (see Figure 5.2).

This large-scale overview, although interesting, was somewhat confusing on two fronts. First, teachers' beliefs about their role as the teacher and about how students' learned (both of which were more traditional), appeared to be in conflict with their views of what they were doing in the classroom (in terms of their choice of delivery, use of collaboration, and the physical environment). Further, the teachers' views of what they were doing in the classroom were not congruent with what I had observed during the course of my work (observing classrooms was a core component of my job in Abu Dhabi). The next section compares the responses of the case study teachers with those of the whole sample, to ensure that the case study group involved in the study was representative of the main group.

5.2.2 Case Study Teachers' Responses to the TBS

To ensure that the case study group was representative of the main sample, this section reports the descriptive analysis of the case-study teachers' ($N=15$) responses to the TBS. The means and standard deviations are reported in Table 5.2 for the mains sample ($N=182$) and case study sample ($N=15$). In addition, the means were generated for the critical instance case study teacher, Maryam, for whom a narrative was written.

Table 5.2 Mean Scores for each TBS Scale for Arab Teachers, Case Study Teachers and Maryam

| | Role of the Teacher | Philosophy of learning and knowledge acquisition | Choice of Delivery. | Collaboration | Physical Environment |
|---------------|---------------------|--|---------------------|---------------|----------------------|
| Arab teachers | 1.72 | 2.97 | 3.29 | 3.64 | 3.67 |
| Case study | 1.82 | 2.73 | 3.46 | 4.30 | 3.67 |
| Maryam | 2.11 | 2.45 | 3.31 | 3.95 | 3.40 |

$N=182$ Arab teachers for the whole sample and 15 case study teachers

Based on the figures provided in Table 5.2, a graphic profile of the responses (average item mean) for the three groups is provided in Figure 5.3. The profile indicates that, when compared to the large sample, the responses of the case study teachers had a similar pattern, indicating that the views of these case study teachers were, by and large, reflective of the other teachers in the sample. Maryam's responses, however, were higher than her counterparts for the teachers' role scale. That is, Maryam considered herself to be more constructivist in terms of her role as the teacher than did the other teachers.

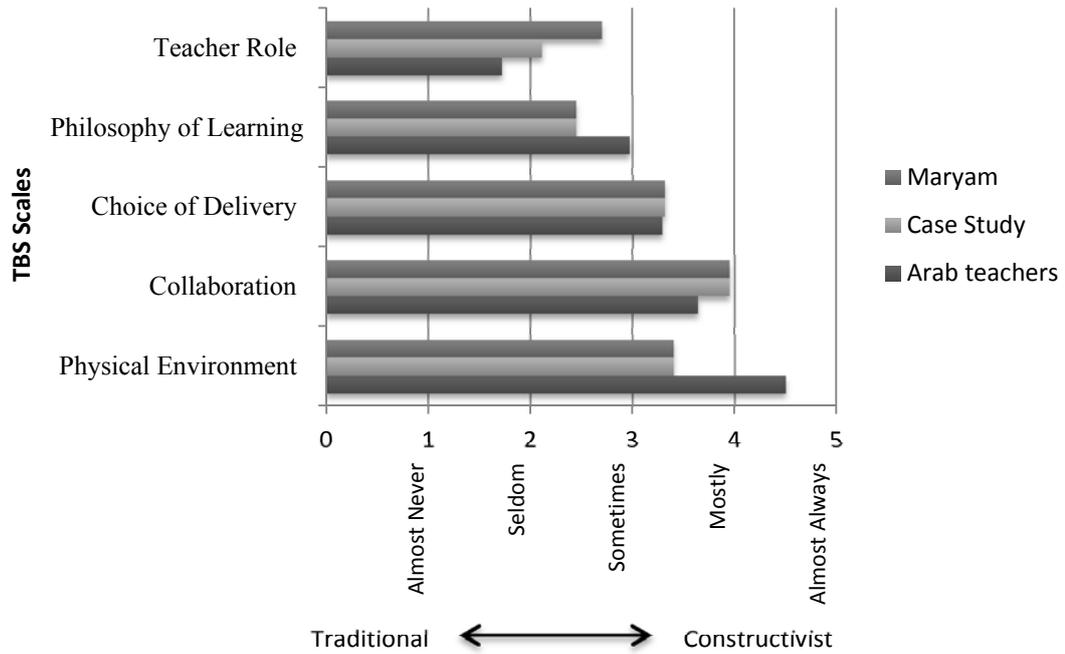


Figure 5.3 Comparison of Teachers’ Responses to TBS Scales: Arab Teachers, Case Study Sample, and Maryam

5.3 Relationships between Teachers’ Beliefs and Practice

An important aspect of the present study was to examine whether a relationship existed between teachers’ beliefs about teaching and their classroom practice (as perceived by their students) (Research Objective 4). The COLES was used to help examine the extent to which teachers’ beliefs about teaching were reflected in their classroom practice.

Simple correlation and multiple regressions were used to examine the relationships between each of the five teacher belief scales and the eight learning environment scales. Simple correlations were used to provide information about the bivariate association between each teacher belief and learning environment scale. Multiple regression analysis was used to reduce the Type I error rate associated with the simple correlation analysis and to provide a more complete picture of the joint influence of the teachers’ beliefs on the learning environment perceived by the students. For the regression analysis, the set of five teacher belief scales constituted the dependent variable and the learning environment scales constituted the independent variables. The results are reported in Table 5.3.

Table 5.3 Simple Correlation and Multiple Regression Analyses for Associations between Teachers' Beliefs and Students' Perceptions of the Learning Environment Using the Class Mean as the Unit of Analysis

| Scale | Shared Control | | Teacher Support | | Formative Assessment | | Clarity of Assessment | |
|------------------------------|----------------|---------|-----------------|--------|----------------------|--------|-----------------------|---------|
| | r | β | r | B | r | B | r | β |
| Role of Teacher | 0.05 | -0.06 | -0.07 | -0.13* | -0.03 | -0.10 | -0.03 | -0.13* |
| Philosophy of learning | -0.05 | -0.03 | -0.06 | -0.01 | 0.08 | -0.06 | -0.08 | -0.01 |
| Choice of Delivery | 0.06 | 0.12 | 0.06 | -0.05 | -0.13* | -0.11 | 0.01 | -0.11 |
| Collaboration | 0.09 | 0.18* | 0.12* | 0.20** | 0.14* | 0.12** | 0.12* | 0.23** |
| Physical Environment | 0.03 | 0.03 | -0.05 | 0.01 | 0.06 | 0.07 | 0.06 | 0.09 |
| Multiple Correlation (R) | | 0.15 | | 0.17* | | 0.21** | | 0.19* |

| Scale | Involvement | | Personal Relevance | | Cooperation | | Differentiation | |
|------------------------------|-------------|---------|--------------------|---------|-------------|---------|-----------------|---------|
| | r | β | r | β | r | β | r | β |
| Role of Teacher | -0.03 | -0.05 | 0.07 | -0.07 | -0.10 | -0.12* | -0.04 | -0.10 |
| Philosophy of learning | -0.09 | -0.07 | -0.08 | 0.01 | -0.17* | -0.12* | -0.11 | -0.52 |
| Choice of Delivery | 0.02 | -0.08 | -0.01 | 0.23** | 0.04 | -0.04 | 0.01 | -0.12 |
| Collaboration | 0.08 | -0.14 | 0.21* | 0.38** | 0.09 | 0.14 | 0.11* | 0.21** |
| Physical Environment | -0.01 | -0.01 | 0.11* | 0.11 | -0.01 | 0.01 | 0.02 | 0.03 |
| Multiple Correlation (R) | | 0.14 | | 0.30** | | 0.21* | | 0.18* |

* $p < 0.05$ ** $p < 0.01$

$n = 15$ teachers and 331 students from one class for each teacher

The results of the simple correlations, reported in Table 5.3, indicate that eight of the 40 correlations were statistically significant ($p < 0.05$). The statistically significant relationships existed between teachers' views of collaboration and five of the learning environment scales: teacher support, formative assessment, clarity of assessment, personal relevance and differentiation. In all cases, the correlations with the collaboration scale were positive in direction. Statistically significant ($p < 0.05$) relationships also existed for: the philosophy of learning and cooperation scales; the choice of delivery and personal relevance scales; and the physical environment and personal relevance scales. With the exception of the relationship between the physical environment and personal relevance scale, the direction of all the other statistically significant relationships was negative. These findings suggested that, overall, the relationships between teachers' beliefs (as assessed using the TBS) and their constructivist-oriented practices (as assessed using the COLES) were weak.

To interpret which TBS scale made the largest contribution to explaining variance in the learning environment, the regression weights were examined. This analysis helped to determine the influence of a particular teacher belief variable on the learning environment when all of the other teacher belief variables in the regression analysis were mutually controlled. Table 5.3 reports the results of the multiple regression analyses for associations between teachers' beliefs and students' perceptions of the learning environment using the class mean as the unit of analysis. The multiple correlation (R) (reported in Table 5.3) suggests that all five teacher belief scales accounted for statistically significant ($p < 0.05$) amounts of variance in six of the eight learning environment scales: teacher support, formative assessment, clarity of assessment, personal relevance, cooperation and differentiation.

To identify which TBS scales contributed to the variance in the learning environment, the standardised regression weights (β) were examined. The results, reported in Table 5.3, show that the role of the teacher scale was significantly and negatively related statistically to students' perceptions of teacher support, clarity of assessment and cooperation. That is, teachers who perceived their role to be more traditional in nature were less likely to create classroom climates that promoted these constructivist features. The philosophy of learning scale was negatively related statistically to students' perceptions of cooperation, indicating that teachers with

more traditional philosophies of teaching and learning were less likely to include cooperative activities in their classroom. The choice of delivery scale was significantly and positively related statistically to students' perceptions of personal relevance. The collaboration scale was significantly ($p < 0.05$) and positively statistically related to six of the eight learning environment scales: shared control, teacher support, formative assessment, clarity of assessment, personal relevance and differentiation. For the physical environment scale, there were no statistically significant correlations with any of the Learning Environment scales.

Although the statistically significant relationships described above made intuitive sense, overall, the associations between the teacher belief scales and the learning environment scales were not strong. This result was somewhat surprising, as it was anticipated that the students of teachers who held more constructivist views would perceive teachers' practices to be more constructivist. While the results were disappointing, important qualitative data helped to explain them. These findings are reported in the next section – examining the translation of beliefs into practice.

5.4 Examining the Translation of Beliefs into Practice

The previous two sections identified two anomalies. First, the quantitative data indicated teachers' beliefs about their role as the teacher and how students learned (which was reported to be more traditional), appeared to be in conflict with their views of what they were doing in the classroom (in terms of their choice of delivery, use of collaboration, and the physical environment). Also, the teachers' views of what they were doing in the classroom were not strongly correlated to the learning environment that they were creating (as perceived by the students). Therefore, Research Objective 5 sought to examine any incongruence between the teachers' views of their implementation of constructivist practices and their classroom practice. To help to address this research question, a case study approach involving 15 teachers was used. Observations and interviews with these 15 teachers helped to provide insights into the quantitative findings.

This section is divided into two parts: the first uses a narrative to provide a context for the results that follow (Section 5.4.1); and the second identifies the incongruences that were observed between teachers' beliefs about what they were doing and their actual practice through an interpretative commentary of the narrative (Section 5.4.2).

5.4.1 Contextualising Classroom Practice: A Narrative

To help to contextualise the findings, this section provides a narrative based on a lesson given by one of the case study teachers. The section begins with a preamble to set the scene for the narrative (Section 5.4.1.1), which is followed by the narrative used to describe the case study teacher's lesson (Section 5.4.1.2). The narrative is followed by an interpretative commentary that uses the narrative to highlight the translation of beliefs into practice across all of the observations and in light of the five TBS scales (Section 5.4.2).

5.4.1.1 Preamble to a lesson observation

The teacher, Maryam, was selected for the narrative because her lesson embodied much of what was observed in the lessons of the other case study teachers. Further, her comments were consistent with the majority of teachers who were interviewed. She was, however, atypical of the other case study teachers, insofar as she had been identified by the principal of the school as an exemplary teacher. Therefore, unlike the other case study teachers, Maryam had been given her own classroom that she was free to decorate as she saw fit. Maryam conveyed, through her manner and confidence, the belief that she was implementing the constructivist practices required by the reform. This provided an example to throw light on the gap between teachers' beliefs about their use of constructivist practice and what was observed.

Maryam was known by other teachers within the school to deviate from the textbook, make lessons fun and use student-centred methods. She was also well known for her work with other teachers, for whom she often provided demonstration lessons – both within this school and at other nearby schools. She was hailed as a model teacher and, as a result, often asked to mentor less experienced teachers at the school.

As with most of the case-study teachers, Maryam came to the pre-lesson interview armed with her preparation files and certificates of participation at workshops and training sessions. During the interview she explained that, even before the reform efforts had begun in Abu Dhabi, she had been interested in learning about and using different teaching strategies. Her quest to know more about teaching methods was sparked by three of her own teachers, who had become her role models. These teachers were different from other teachers and had all inspired her to make learning fun.

Maryam appeared keen to impress on me her knowledge of the new pedagogy. She used the new terminology frequently. For example, when asked how she knew her students had learned something, she quickly responded, “we call it outcomes”. However, it became apparent early in the interview that her understanding of the terms may not always be correct. For example, when asked for an explanation of what outcomes were, she responded, “if we could follow the objective it means that we must have the outcomes. It means that they have learned.” In some cases Maryam appeared unsure of herself and, at times, contradicted her explanation. For example when asked to explain her role as a teacher, she stated that teaching was “related to the teachers but now it is related to technology”. She then expanded on her explanation, saying that she was both a visual and kinaesthetic learner. When questioned further, Maryam explained that as a teacher teaching for the new paradigm, her classroom was now student-centred and that she had multiple roles as a guide, a facilitator, a dictionary and an artist, leading her students to learn how to learn. She elaborated that students in a student-centred environment “learn from each other through interaction while the teacher watches them.” Later in the interview, however, she seemed to contradict herself, saying that, if the students did not do as she requested, she would start again from the beginning.

Maryam told me of how her pedagogical approach had changed five years earlier when she attended a professional development course. She explained that since then, she “stopped being the centre of the class, as is the Arab way of teaching where teachers tell students what to do.” She went on to explain that now she uses activities, mostly games and play, as a means of keeping students motivated and happy.

When Maryam showed me her lesson plan, I asked about the objective of the lesson, to which she stated that the objective was for students to learn figurative language. When asked for clarification Maryam corrected herself and changed the objective, stating that the students would understand the meaning of simile and metaphor. When asked why she had chosen this objective, she did not refer to curriculum but stated, “This is something the students need to know, as it will be in the examination.”

Maryam explained that for most teachers the student-centred approach created behavioural management problems. She assured me, however, that she had overcome this with strict rules and a system of extrinsic rewards and punishment:

I have levels of punishment and levels of rewarding students. If a student talks I put a triangle in front of her name on a chart. After recording three triangles the student must go to the school administration office where the principal will scold her.

Maryam expressed that she understood other teachers’ hesitancy about moving to a student-centred approach, saying that change was difficult and scary. She expressed that she felt that for many teachers the fear of failure might prevent them from adopting a student centred approach in their classrooms.

5.4.1.2 Narrative - A Lesson Observation

Maryam walked me to the classroom where the lesson observation was to take place. As we entered the room, Maryam stood back and watched for my reaction. The room, originally a resource room, had six round tables with six chairs around each. I was genuinely surprised, as this was not the usual configuration for classrooms in the UAE (that generally had desks in rows). She had told me earlier that, when the principal had asked her to work at this school, she had demanded a room of her own. Given that most teachers in the UAE were required to move from room to room, my sense that she must be of value to the principal increased.

The room was colourful, a contrast to many other classrooms that I observed which had few, if any, displays. The walls of the classroom were painted in bright orange and green and were almost completely covered with colourful vocabulary lists and posters of grammar rules, charts and examples of student work. I felt somewhat overwhelmed by the number of charts that took up every spare inch of wall space, with many words that were too small to be decipherable from where I stood. The charts and materials did not appear to be related to a particular learning theme or topic but, rather, an accumulation of material. The room was well equipped, as was the norm in Abu Dhabi, with a computer-connected data-show unit, cassette recorder, DVD and white board.

The students came into the classroom, rushing to seat themselves near friends, chatting and laughing amongst themselves. Without greeting the class as a whole, Maryam introduced the lesson by telling the students that they were going to hear a song. The lesson objective, Speaking and Listening: to recognise and identify similes, metaphors and personification, was clearly written on the white-board, but she did not draw the students' attention to it. The students were still settling themselves, but without waiting, Maryam proceeded to play a rap song, which caught their attention. The students started to nod to the beat, quietening down and listening intently. This was not a normal practice in Abu Dhabi, where song was regarded by more conservative communities as taboo and against the principles of the Islamic religion.

When the song ended, having gained the students' attention, Maryam explained the importance of figurative language and the differences between similes and metaphors. I was vaguely surprised that she made no reference to the song, even though it had included much figurative language. Without pausing for questions from the students or asking any questions, Maryam went on to instruct students on how to play a word game that involved using the letters of their first name as the starting letter for different adjectives. The students watched her as she wrote her name on the board, vertically, and then using each letter as a starting letter, she wrote adjectives. For example, next

to the 'M' she wrote 'mighty' and next she wrote, 'A' – 'active'. Once she had finished showing the students the example, Maryam stood at the front of the class watching while students worked on the task of finding adjectives to match the letters of their name.

As the students started the activity, I took the opportunity to walk around and observe more closely what they were doing. I noticed that at least two students in each group of four or five were not doing the activity but, rather, were watching other members of their group. Some of these students were writing words that began with the starter letter that the teacher had used (M), but the words they placed alongside the letter were not necessarily adjectives (as they had been instructed to do). The students who were not writing seemed to be confused as to what they were expected to do. I asked one of these students to explain to me what she had to do, and she shook her head.

From where Maryam was standing at the front of the class, she noticed a student who was not doing the activity as she had explained. Upon noticing this she called the attention of all of the students and, again, wrote her own name vertically on the board and instructed the student to find adjectives beginning with the letters of their own name. I noted that the students in the group that I was standing close to wrote Maryam's name on their papers, rather than their own names, and copied her example.

After about five minutes, some of the students began talking to each other and doodling on their papers. At this point, Maryam attracted the attention of the class and introduced the next activity. From where I was sitting I could see that not all of the students had finished the first activity but they stopped what they were doing and listened to the teacher. Without referring to the previous activity (or to the lesson objective), Maryam gave instructions for the next activity. She asked students to use the adjectives they had used in the first activity in sentences. She gave the students some examples on the board including: *I am as good as gold; I am as active as a bee.* Apart from her reference to metaphors and similes in the introduction to the lesson, Maryam did not refer, at this point, to the differences between metaphors and similes.

Using the adjectives they had written in the first exercise, students were instructed to construct sentences and then to decide, with other members of their group, whether these were similes or metaphors. When Maryam had finished instructing the students, she informed them that there was a reward for the group that was first to finish.

As the students started to work on the activity, I noticed that there was no discussion between the group members but, rather, students told their answers to the members of their group. Close observation of one of the groups indicated that there was no discussion related to the meanings of the words or questions about whether the words were similes or metaphors. I also noted that, as with the previous activity, there were students in all of the groups who did not contribute to the activity with many of the students copying the sentences from other members.

After the second activity Maryam drew the students' attention to the front of the class so that she could explain the difference between similes and metaphors. She provided a brief explanation and gave some examples of similes and metaphors e.g. 'as cold as ice' (simile); 'she is a busy bee' (metaphor). She then gave instructions for the third activity — to match words and to complete simple similes, such as 'as cold as ____ (ice)'. Maryam had prepared a number of phrases and parts of phrases that were required to be either matched or identified as being simile, metaphor or personification. These were on separate pieces of paper. Each student was given one slip of paper. I noted that, in each of the groups, the same students did most of the work and seemed to be giving the answers to the other students in the group. I asked one of the groups what their task was. The students did not respond, avoiding eye contact, and busying themselves talking in Arabic.

When Maryam perceived the students to have completed the task, she moved onto the fourth activity, which involved the students checking the wall charts for information. The activity relied on students' recall of words. The students were each given a sentence containing either a simile or a metaphor or a

picture of a simile and had to find the picture or phrase that corresponded to what they had been given. During this activity some of the students asked her for help. In each case Maryam pointed them in the direction of the wall charts and instructed them to look for the answers and find words and pictures rather than relying on her to provide the answers. As with the previous activity, Maryam remained near the front of the room, watching the groups and helping one group near to where she stood.

When students started to become talkative Maryam called for their attention once more and explained how similes differed from metaphors. Maryam gave each student two cards, each with a simile. The students were asked to share these cards with a partner and to change the simile into a metaphor. Once they had completed the exercise they were asked to move to another person and repeat the exercise. I noticed that the students did not question whether their changes of similes to metaphors were correct. In all of the cases that I observed, the students said their phrases and moved on. There was no checking by Maryam whether the students had correctly identified similes or metaphors. Maryam stood aside ensuring that students were moving from one partner to another and having fun.

When students had moved to a few students, Maryam asked them to return to their seats. She explained, once again, the difference between similes, metaphors and included personification. After her explanation she introduced the last activity, which involved students standing and moving in a circle. As more physical space was required, two of the groups were allowed to move into the corridor outside the classroom. Students were instructed to make sentences using the aspects of figurative language. Without an opportunity to ask questions, the students were instructed to begin the final activity. The students seemed to respond positively to the physical activity by chatting, giggling and laughing. Maryam joined in with one of the groups helping weaker students who could not make up a sentence by saying one for them. Students who were able to remember the examples of similes, metaphors and personification were able to complete the activity; the remainder relied on the others to help them.

The lesson ended abruptly when the school bell rang. Students immediately gathered their bags and began to move noisily to the door and out of the room, without saying good-bye. Maryam raised her voice above the din of students to give them some homework, but the students generally did not pay attention. The notes that students had written during the lesson, on scraps of paper or post-it notes, were left lying on the tables or thrown in the rubbish bin.

5.4.3 Interpretative Commentary

During the lesson Maryam moved with speed from one game to another, having students shift into groups and move around the room. Throughout the lesson students were busy with a variety of written and physical activities. While the students were busy with the activities, Maryam either stood back and watched or assisted one or two students at a table that was near to where she observed the class. She did not walk around to all of the groups, nor did she check students' work to determine whether students were on task or had understood the activity. There appeared to be no time for students to ask questions or puzzle out problems and there was no differentiation of activities for weaker or stronger students. Further, from Maryam's position at the front of the class (where she stood), there was little opportunity for students to clarify what was meant or for her to know which students were unable to complete the activities in the correct manner. In many cases, students copied the answers from their peers.

The observations indicated that, despite the use of numerous activities, many aspects of Maryam's teaching were neither traditional nor constructivist. In some respects, her teaching reflected a more traditional approach. For example, in terms of her role as the teacher, Maryam was firmly in control. Maryam decided which activities would be used, controlled student behaviour and asked all of the questions. Although during the interview she had talked about her role in a student-centred classroom as a facilitator and an artist, her attempts to guide the learning appeared to be more about not telling the students the answers (for example when she directed students to the

wall posters to find the answers). Maryam's tight control over the activities was similar to other case study teachers who were observed.

Observations indicated that Maryam's understanding of being a facilitator was about not involving herself in student group discussion or student work. Like Maryam, who stood back and observed the activities, most case study teachers did not interact with the different groups of students to assist them in their learning. In all of my observations there was limited evidence of teachers probing and questioning students in ways that challenged their thinking.

The narrative describes an activity, during which Maryam noticed that many of the students were not following her instructions. At this point she stopped the lesson and repeated the instructions to the whole class using the same examples that she had previously used rather than moving to different groups.

Maryam's classroom differed from many of the other case study teachers in that there were many resources on the walls. This physical environment was more in keeping with a constructivist approach and was only partially observed in the classes of two other case-study teachers. The walls were brightly coloured and almost every part of the pin-up boards were covered with vocabulary, student work, phrases, and some pictures. Maryam spoke of the importance of students constructing their own meaning and viewed the use of visual aids as a means for students finding the answers rather than being told. Maryam explained that "the walls are talking to the students", referring to the visual materials as a means of teaching and learning for the students. However, it was apparent that these materials were not all related to the topic that was being taught but, rather, were a collection of materials made by the teacher.

For Maryam and two other teachers who had created a physical environment resembling one that would be used in a constructivist approach, the decoration of the room was a means to create "a nice cheerful, friendly classroom, so when they [the students] come in they feel a little bit relaxed" [Teacher 4]. Like Maryam, the other two teachers who had posted posters and charts were proud of their achievement. It

appeared as a triumph over the old system where the use of the physical environment was forbidden because it was viewed as a distraction to student learning.

The narrative described how Maryam used a range of activities throughout the lesson, during which students wrote, talked, shared and moved around the room. In this respect Maryam had moved away from the textbook, as required by the reform. However, the different activities, despite their range, were all, on the whole, based on memory recall and were limited in terms of challenge and complex thinking. Further, some of the activities were not related to the objective of the lesson. Although the activities kept the students busy and in many cases happy, the simplicity of the activity made the learning value questionable.

Maryam sat students in groups and provided group activities throughout the lesson. Her interviews (and those of the other teachers) suggested that the use of collaboration was valuable. As one of the other case study teachers said “this is a good way of letting students learn from each other” [Teacher 1]. However, in some cases, the use of group work appeared to be only done in order to comply with the reform agenda. It would appear that, for the teachers, it was important to be seen to be cooperating with the reform. Arranging the classroom so that students were seated in groups provided visible evidence of their compliance. As one teacher said “We are trying to cooperate with the change. We are trying to digest the change and make it a reality” [Teacher 6].

Despite the arrangement of seats into groups, it would appear that, in the majority of cases, the case study teachers were not providing activities that required collaboration. Interviews indicated that in many cases, the teachers did not understand the purpose of group work and how this could be used to maximise student learning. For example, as described in the narrative, stronger students were observed to give the answers to the weaker students. Based on the interviews with the teachers, it would appear that this arrangement was often viewed as peer tutoring. One of the teachers felt that, in a constructivist approach, the role of the stronger student was to help the weaker students. To this end she explained “I focus on the one who is leader, the best one, who gives them the instruction if they need the help” [Teacher 10].

I did not observe Maryam guiding students or allowing them time to master any element of the lesson. Although the objective, written on the white board, was for students to be able ‘to recognise similes and metaphors’, there was no reference to this at any point. At the end of the lesson, students did not seem to know the difference between a simile and a metaphor and none of the activities had challenged them to work out the meaning or to identify the differences between these two.

Despite Maryam’s use of different activities, the narrative does not indicate the use of a constructivist practice. For example, students were not given the opportunity to reflect on or to discuss how to manage any of the activities, there was no problem-based learning, and students were not asked to make connections between the new material and what they knew. Although the narrative describes a classroom in which the teacher has moved away from the traditional approach of using a text book and seating students in single rows, it lacked challenging opportunities for students to construct meaning and knowledge. As such, her lesson retained a traditional perspective that emphasised the recall of content.

The observations portrayed in this narrative were not isolated to Maryam. It became clear during the interviews and subsequent observations that many of the teachers were convinced that they were incorporating constructivist approaches in their practice, whereas in reality, this was not the case. Using the disassembly, reassembly method, the qualitative information was analysed in terms of the teachers’ understanding of concepts associated with constructivism. Data, analysed to examine the understanding illustrated by the teachers in terms of constructivist understanding, were categorised in terms of having limited, some or good understanding of concepts.

5.5 Explaining any Incongruence between Expected and Observed practice

During the analysis of the qualitative data, themes emerged with respect to aspects that affected teachers’ implementation of the reform initiatives. These responses were quantified and displayed visually as profiles. Analyses of the data indicated that there were various factors that influenced the extent to which teachers implemented

the reform initiative. This section reports findings that help to answer research objective 5, which sought to examine reasons for any incongruence between teachers' views of their implementation of constructivist practices and their observed classroom practice.

The teachers who were interviewed emphasised their willingness to comply with the reform requests. The teachers all expressed that they were trying to adhere to the requirements. For example, one teacher said, "I am trying to follow the procedures as much as I can" [Teacher 12]. Despite the good intentions of the teachers and their willingness to comply with requirements, many of their statements showed a lack of knowledge and understanding, or in some cases misconceptions, of what it meant to be a constructivist teacher (reported in Section 5.5.1). Further, the teachers' interpretations of constructivist terminology were often not congruent with the constructivist approach (reported in Section 5.5.2). Each of these is discussed below.

5.5.1 Understanding of Constructivist Philosophy and Pedagogy

Analysis of the data indicated that all of the teachers, to differing degrees, lacked understanding of the constructivist philosophy and pedagogy. This lack of understanding was evident in terms of their understanding of what constructivism meant in regard to: their role as teachers; the curriculum; lesson planning; and what constituted outcomes or lesson objectives. The percentage of statements that were incongruent for each of these categories is portrayed graphically in Figure 5.4. For example, fewer than 30 per cent of the statements made by teachers in relation to their understanding of constructivism were in keeping with constructivist intentions and just over 70 per cent of the statements were not. The results for each of the categories (constructivism, teachers' role, curriculum, lesson planning and outcomes/objectives) are expanded upon below.

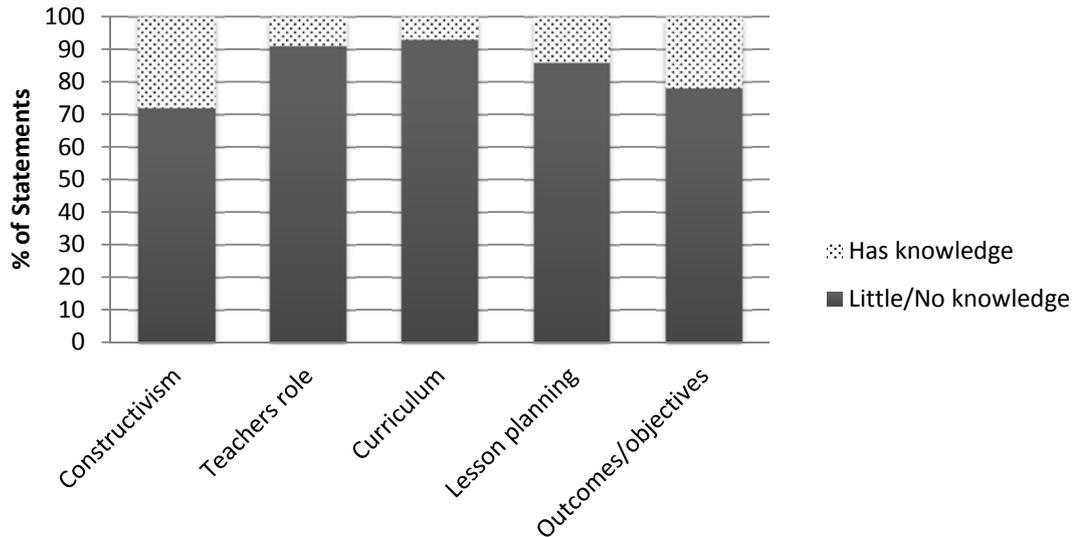


Figure 5.4 Percentage of Interview Responses that Demonstrate Knowledge Compared with Lack of Knowledge in each Category

5.5.1.1 *Constructivism*

The results indicated that approximately 70 per cent of the statements made by the teachers during the interviews showed a lack of knowledge or understanding of the term constructivism. When asked to explain their understanding of constructivism, there were a wide range of responses that were not congruent, such as: “A constructivist curriculum is one that constructs social behaviour, so ... interacting with people” [Teacher 3]; “Constructivism means to go step-by-step” [Teacher 8]; “The lesson is now student-centred – the students are doing everything. I give them a small hint and they have to get the objective, without me telling them” [Teacher 2]; “We are free to choose, or to design our own curriculum. The teachers are responsible for creating their own curriculum” [Teacher 1]; “Students can’t look for information by themselves. I should present them with all the information” [Teacher 11]; and, “The subject learning plan⁸ provided by our Adviser is the Curriculum” [Teacher 14].

In the cases where teachers were able to provide accurate definitions, it became clear during the interviews that their understanding of these definitions was incomplete. When asked to expand on these definitions, many of the teachers had different ways

⁸ The learning plan was a document of suggested lessons and activities for teachers to use to assist them in the curriculum implementation, provided by the Curriculum Department of ADEC.

of explaining what constructivism was. For example, one teacher explained that in the constructivist approach, “The teacher shouldn’t be very dominating in the classroom and the students need to do the lesson” [Teacher 2]. Another teacher admitted she did not know how to explain what constructivism was but that “I know the word *construct* means to build something” [Teacher 10]. However, this teacher could not use this information to help her to further explain the term. Teachers in all cases lacked understanding and knowledge of the constructivist philosophy of education and reasons for related pedagogical practices.

5.5.1.2 Teachers’ Role

When asked about their teaching role, the teachers who were interviewed were consistent in stating that they were now guides and facilitators in the teaching and learning process. It would appear, however, that what this role looked like in practice was not clear for many of the teachers. For example, when asked to explain the role further, one teacher responded, “Sometimes I assist students” and qualified this by stating that the teacher “must involve herself less in the classroom” [Teacher 10]. She went on to say that she must now watch the students and not intercede in their learning.

The teachers’ lack of understanding of the role of a guide or facilitator was also reflected in my observations, and described in Maryam’s narrative. In many cases, the teachers gave the students instructions, then stood back and watched them before moving on to the next part of the lesson. In all classes there was little evidence of teachers’ facilitating learning but, rather, they were observed moving around the class while students worked on worksheets, but did not get involved.

Interviews with the teachers indicated that there was some confusion with respect to the new role that they were required to play. Disturbingly, some teachers felt that their role had been diminished in importance since the reform. One teacher stated that she was “*just* a facilitator, *just* a guide” [Teacher 15]. Another teacher was confused and a little angry at the new approach, stating emphatically “but we [the teachers] **are** here. So we have our place” [Teacher 6]. These teachers captured the feelings of others who felt that the role of facilitator involved teachers standing back

and watching students and no longer being important to the teaching-learning process. Overall, the case study teachers showed a lack of understanding of the role of the teacher and held misconceptions of what this meant in practice.

5.5.1.3 Curriculum

Eighty per cent of the teachers' responses related to the curriculum indicated that they had limited knowledge of the curriculum and how the curriculum documents should be used to help them to plan their units of work and the lessons. The interviews with teachers indicated that none of the 15 case study teachers had used the curriculum documents to plan their lessons. Neither was there any reference by any of the teachers to the curriculum outcomes that were required to be attained. When questioned about how they decided what they were going to teach, there appeared to be little understanding of what was involved. For example, one teacher responded, "I decided in the bathroom! So ... I was having a shower in the morning when I thought 'what is the best thing to do today?' Maybe a role-play? It will be more interesting for them" [Teacher 8]. Another teacher, when asked how the lesson (about famous people) was linked to the curriculum, did not refer to the curriculum but stated, "They [the students] should know about the president of their country" [Teacher 7]. When asked to explain their understanding of the curriculum, teachers generally described it as being more student-centred. This was correct in terms of the approach to teaching and learning but not with respect to the curriculum itself. None of the case study teachers showed any understanding of the curriculum or knowledge of how to use the curriculum for their lesson planning and longer-term objectives for the class or students.

5.5.1.4 Lesson Planning

Prior to the implementation of the education reform, teachers taught page-by-page from a textbook. The objective was to cover the expected number of pages and exercises in the textbook and student workbook as prescribed by the textbook writers for each lesson. Teachers were expected to 'warm-up' the students, then explain the new material, and then allow students to complete the worksheets provided in the

workbooks. With the introduction of the education reform, teachers were now expected to develop their own lessons plans around curriculum objectives with activities, rather than worksheets, designed to assist students in mastering the desired outcomes.

In terms of lesson planning, 75 per cent of the teachers' responses showed little understanding of how to plan lessons and tasks. For example, Teacher 14, clearly confused about what a lesson plan was, said, "The English learning plan is the curriculum". Eight of the 15 teachers also expressed a lack of confidence in developing lesson plans and all of them felt that the development of lesson plans and objectives should be the responsibility of the curriculum designer. These teachers did not view it as their role to create lesson tasks and activities. To this end one teacher expressed:

Can a teacher design his own curriculum? Is it suitable for the teacher to design his own activities from A to Z? Can he do that? And is a teacher qualified to do that? Personally I think not all teachers can do it. Not all teachers can design their own activities. If you give them the chance, if you give them the topic and the guiding questions and the text type, and then let them go and do whatever they like. In this country it's not useful. It's not successful. It doesn't work with most of the teachers. Everybody's complaining about that, they say that this is not our job, it's not our job to find the text, and to find resources and to do this and that, we only need the textbook to teach. [Teacher 15]

This teacher went on to elaborate that, because they had previously taught using a traditional textbook curriculum in which exercises were provided, they had never had to create activities, much less match objectives. Although some teachers did not express strong views about lesson planning, they generally expressed a lack of confidence and knowledge about designing the appropriate tasks and lessons. For example, one teacher said, "Understanding is difficult. I can't grasp all the ideas or what they mean within this new curriculum" [Teacher 1]. Another expressed concern that she may be seen as a failure: "Before I was a clever teacher. It is hard to deal with the new curriculum" [Teacher 3]. Further, Teacher 3 explained that there was no

need to plan with the previous curriculum and that is “why we find great difficulty in planning”.

Teachers thus lacked the knowledge of how to plan by targeting various objectives from the curriculum document. In many cases they misconceived the teaching guidelines given to them by the curriculum department as being the curriculum. This they followed step by step without cross-referencing the curriculum or identifying class objectives.

5.5.1.5 Lesson Outcomes/Objectives

When the case study teachers were asked what they understood by the terms lesson objective or learning outcomes, the response, for the majority of the teachers, was vague. Approximately 80 per cent of the teachers’ responses indicated limited or no understanding of the meaning of an outcome or a lesson objective. It would appear that designing a lesson to master an outcome was a foreign concept (possibly because prior to the reform, all of the lessons had been based on the acquisition of facts and content knowledge). When asked to describe the lesson objective (for the lesson to be observed), one teacher responded, “So we just warm up, then I will introduce some new vocabulary related to the video. I will tell them to watch the video, take notes and then they are going to write or to speak or to talk about the video” [Teacher 15]. Another teacher responded:

The outcomes ... aah! The learning of this lesson? In fact I’m going to tell them. ... You mean the adjectives? Perhaps I’ll follow this worksheet, let’s say mechanically. I mean to go on reading more with direct response questions, which ADEC usually desires in its approach. [Teacher 1]

In both of these cases, despite the fact that these lessons were based on the acquisition of content knowledge and facts, the teachers were able to explain what they intended to do in the lesson, but neither could articulate the objectives for the lesson. This was not an uncommon finding during the interviews. In general, the teachers did not understand that lesson planning involved focusing on certain objectives delineated in the curriculum for that year group. Their focus was on

content, just as it had been in the textbook curriculum and accompanying activities for students that focused on acquisition of content, not on skill.

5.5.2 Conceptual Interpretations

In addition to the lack of knowledge described above, the interviews and observations indicated that the teachers also held misconceptions about many of the educational terms related to constructivism. That is, the meanings the teachers attached to concepts were not aligned with accepted constructivist interpretations. For example, when asked about the term ‘complex tasks’, one teacher explained that these were “complicated tasks” and explained that these were “difficult or hard tasks.” Another teacher explained that complex tasks were activities that the students were required to put more effort into. In another example, the terms ‘dialogue’ and ‘sharing’ were understood by some teachers to imply opportunities for stronger students to give the answers to the weaker students or to allow students to copy these answers from stronger students. For example: “I prefer in each group to have one excellent student, another good, and another poor, so they can share together. The leader should give the others the information” [Teacher 10]. When I observed this teacher’s lesson I noted that a strong student gave her answers to the others.

Analysis of the data indicated that the teachers’ interpretations of many of the terms commonly associated with constructivist pedagogy were not consistent with the constructivist intention. In some instances teachers had little understanding of a concept; however, teachers mostly held misconceptions of constructivist terminology. The most common misconceptions, portrayed graphically in Figure 5.5, were of the terms learning, activities, collaboration or group work, and student-centred learning. Each of these is explained below.

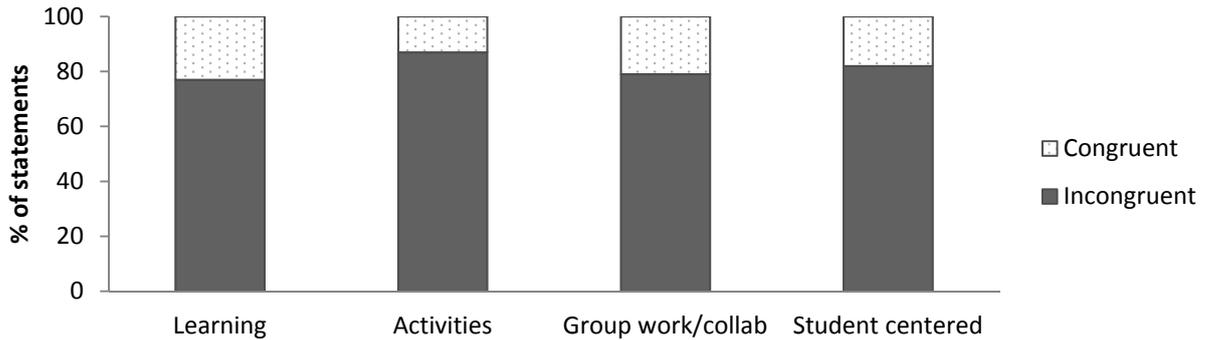


Figure 5.5 Percentage of Responses Showing Conceptual Understanding and Misunderstanding in Key Areas Related to Constructivist Teaching

5.5.2.1 Learning

Learning, from a constructivist point of view, is a process in which the brain “is actively involved in exploring physical sites and materials and asking questions to which it actually craves answers. ... Passive experiences tend to have little lasting impact” (Gardner, 2000, p. 82). Thus learning is viewed as students actively creating knowledge and mastery of skills through specially designed tasks.

The results indicated that 78 per cent of teachers’ statements that were related to learning were incongruent with the constructivist understanding of what constitutes learning. For example, one teacher stated that learning was “A matter of acquiring facts and information” [Teacher 1], and another teacher stated “Students are learning when they listen to me” [Teacher 10]. Another teacher described learning as “A culture that happens everywhere and a matter of acquiring facts”. This teacher went on to explain that teaching “is a matter of giving information followed by testing students to ensure they had remembered it correctly” [Teacher 1]. During the interviews, none of the 15 case study teachers made mention of the attainment of skills or the construction of information by students in order to create knowledge and meaning. Further, the interviews indicated that all of the teachers espoused a more traditional view of learning, suggesting that they viewed learning as a process of memorising facts and information.

5.5.2.2 *Activities*

When asked to explain the activities that were required to enact the curriculum, 85 per cent of the teachers' responses were related to factual recall, as opposed to the more constructivist view that tasks should be complex, rely on cooperation within the group, and require thinking, sharing, discussion, dialogue and reflection. For seven of the 15 teachers, the purpose of activities appeared to be largely related to ensuring that the students were occupied and not bored in class. For example, Maryam said "if there are a lot of activities in the classroom it means I keep them [students] alert all the time and I don't want them to feel bored".

By and large, the teachers' understanding of the term activities, when used in reference to a constructivist classroom, appeared to be related to the use of worksheets. For example, when asked about what activities would be used, one teacher reflected the responses of the majority of teachers when she said, "I'm going to give them worksheets to fill in" [Teacher 12]. It was of concern that during these interviews, there was no indication that any of these teachers had discerned the appropriateness of the worksheets or their relevance to the curriculum. It would appear that with the removal of the textbook, five of the 15 teachers had made their own booklets consisting of worksheets gleaned from old textbooks. Only two of the 15 teachers preferred to limit the use of worksheets in the classroom. One of these reported, "Sometimes I do give them worksheets but I don't prefer that. I use them specially when the class is a little bit behind and they need to move to the next section" [Teacher 4]. Teacher 4 expressed that she was happy that she did not have to rely on a textbook and stated that she could now "create whatever suits me! This is liberating and I can tailor the curriculum according to the needs of the parents".

Classroom observations supported the interview data, with many of the activities consisting of worksheets. The use of downloadable and shared worksheets, observed in 12 of the 15 classes, gave the impression that for many of the case study teachers, these had replaced the text books and provided a means of covering factual content that there had not been time for in the class. For example, one of the younger and more constructivist teachers regarded the use of filling in answers on worksheets as beneficial "when the class is a little bit behind and I need to move onwards so that

they can finish the section, or when students have missed lessons through field trips, or they are missing a class, I need to use a worksheet” [Teacher 4].

5.5.2.3 Collaboration or Group Work

The constructivist view of collaborative learning or group work is that students work together in flexible groups in which they take on “the responsibility for the activities of the group” (Marzano, 1992, p. 178). A proviso for successful collaborative work is that the tasks set must be challenging and engaging for students, last for days or weeks, and when students need to, they can “interact with others, learn from one another’s words and actions, and capture their own reactions to a topic” (Gardner, 2000, p. 198).

The interview data indicated that 80 per cent of the teachers’ statements related to collaboration or group work were not congruent with the constructivist approach.

It would appear that in general, the case study teachers did not understand the educational philosophy behind group work, and many of the teachers viewed group work as a means for stronger students to assist weaker students. One teacher explained, “It’s multiple abilities in each group, where one of them is excellent, another good and the others poor” [Teacher 9]. Another used groups because “The weak students are a little shy and they need someone to help them” [Teacher 12].

Nine of the 15 teachers appeared to have some understanding of collaborative/group work. For example, one teacher said:

[Collaborative learning] is a technique in cooperative learning, you know. Group work is part of cooperative learning because we have different strategies in cooperative learning, yes. And group work is a major technique in cooperative learning. I love group work. I love cooperative learning. It’s very nice, but unfortunately doesn’t work with all grade levels. It doesn’t work with all students. In [this school] it was very effective. Always was, but here in this school, it’s very challenging. Not easy. Because students are not used to that and they use group work to make noise, to talk, not to work. So, it makes it

harder for me to control students and to manage my class, but with young learners, with grade 7 it is OK. It's not that big a deal. But with grade 9 it's impossible. I tried for, you know, for around two weeks to make them accept this system, to know the meaning and importance of cooperative learning, but it was not useful. It's useless with grade 9. But with grade 7 it's OK. It's fine. [Teacher 11]

However, in many cases, the teachers did not favour the use of group work, expressing that it did not give students time to work or think individually. For example, one teacher commented:

Group work should have its own place, should be respected, should be inside the classroom, but students also should have her own time to reflect, to sit, to write, to understand, to digest the information. So, there should be time for individual work. I know that ADEC wants cooperative learning and students should sit together and make groups and I respect that. At the same time there should be time for me, time for "me" as a person, as a learner, as an individual student. The stronger students do not feel they are getting the praise for their excellent work and the weaker students do not contribute, relying only on the stronger students and not really doing anything. They are just copying from others. [Teacher 6]

Without exception, the case study teachers did not demonstrate an understanding of the notion that: within a group situation, each student should contribute through his own individual thinking; that students should engage in dialogue about their different perspectives; or that each student can contribute through their unique understanding and prior knowledge. The teachers saw the advantage of using groups as a means of: allowing shy students to talk with their peers, because "some are shy or afraid to ask. So they work in groups" [Teacher 14]; helping weaker students — "Weak students need someone to help them" [Teacher 12]); disciplining students — "if they are talking I will put them in discipline groups, which means that the naughty ones will be in different groups so they are not together" [Teacher 13]); or complying with what ADEC has requested — "they are sitting in their levels because ADEC asked us to put them in the levels" [Teacher 11]).

Overall, the teachers' interviews reflected a lack of understanding and knowledge of socio-constructive philosophy and the motivations for collaborative learning. Further, classroom observations indicated that teachers lacked the skills necessary for creating a collaborative environment. Although the majority of the teachers sat students in groups of four to seven students (four of the teachers seated the students in rows), my observations indicated that, in most cases, collaboration as envisaged by a constructivist practice was not taking place. Even though students were seated in groups, teachers generally used a whole of class, didactic teaching method.

5.5.2.4 Student-centred Learning

When teachers were asked to explain what was understood by the term student-centred learning, 10 of the 15 case study teachers were able to provide definitions that were consistent with the constructivist approach. These teachers explained that student-centred learning involved the teacher no longer dominating the classroom and that the responsibility be placed on the students for their own learning. According to these teachers, student-centred learning meant providing opportunities to search and enquire while the teacher monitored the learning process. The teachers also explained that, in a student-centred classroom, students need to be given a chance to speak, to work together and to share with each other. Teacher 3 noted that student-centred learning involved "more work outside the class and less work inside the class," explaining that the preparation was time consuming but important. She emphasised that a student-centred classroom ensured that all students were involved and had a role. She used the analogy of a puppet show to explain a student-centred classroom: "You are watching these puppets, but the work behind is a big job. Designing, making the conversation and manipulating these puppets is not an easy job. So I feel that I am like the puppet show designer" [Teacher 3].

Of all the teachers, there was only one who could not define the term 'student-centred' during the interviews. This teacher described it as "[students] try to figure out what the objective is for today's lesson" [Teacher 10]. Further, interviews indicated that the teachers were genuinely trying to comply with the demands for a student-centred classroom. For example, one teacher said, "I'm really trying to make

the student the centre of the classroom, [where] the role of the teacher is the person who guides” [Teacher 6].

Although generally, teachers did not demonstrate a working knowledge of or understanding of constructivism, they were, for the most part, able to accurately repeat aspects or definitions related to aspects of constructivist learning such as student-centred. These definitions had, in all cases, been provided to them during professional development sessions. For example, Teacher 5 said “Student-centred learning means the learning doesn’t come from the teacher, it comes from the students themselves, when they are engaged in doing a task” [Teacher 5]; Teacher 7 said, “The teacher should not play the main role in the classroom, they should give the students the chance to express themselves” [Teacher 7]; another teacher stated, “The students will learn when they put the effort into their learning because if they research and do the work, they will learn it” [Teacher 13]. Finally, teacher 3 stated “Student-centred education is where the students depend on themselves, not on the teacher. They get there on their own; they search for their own information; they discuss with each other; they give their opinions; they search” [Teacher 3].

This general understanding of student-centred learning, however, was not reflected in the classroom observations. Only five of the 15 case study teachers were teaching in a way that could be considered to be somewhat student-centred. The other teachers, although seating students in groups, continued with direct, whole class, teacher-centred instruction using common simple worksheets for all. For example, Teacher 1 only allowed students to speak when he directed a question to the student, and gave his views and opinions without giving students an opportunity to share theirs. In this class, once most of the students had completed the simple worksheet, they had to listen to the correct answers, with the emphasis being on the acquisition of facts.

Another example of the mismatch between rhetoric and practice was exemplified by Teacher 15’s practice. In this class, all of the students were provided with the same worksheet, with the teacher differentiating the activities by having the stronger students complete the worksheet and the weaker students completing only two or three of the 15 items. Otherwise, the teacher employed whole class, teacher-centred

instruction, writing on the white board and answering his own questions. Such observations indicated a misconception about what collaboration involves.

In a third example, Teacher 11 conducted a more student-centred classroom. Although he employed direct teacher-centred instruction, this teacher interacted with, and created opportunities for students to interact with, the bright, print rich and relevant displays. Students were engaged, seated in groups with more student discussion time than teacher talk time. Students were talking about the topic, which had purposely been selected by the teacher because of student interest.

5.6 Factors External to the Teacher

Analysis of the data indicated that in addition to misconceptions and a lack of understanding of constructivism, there were also factors that were external to the teacher that affected the implementation of constructivist practices. Several factors were found to impact on the teachers' ability to implement and adhere to these requirements, including: workload and time constraints (Section 5.6.1); a lack of resources and teaching materials (Section 5.6.2); lack of support from the school administration (Section 5.6.3); the lack of readiness of the students (Section 5.6.4); and the role of coaches and mentors as advisers to the teachers (Section 5.6.5). Each of these is expanded upon below.

5.6.1 Workload and Time

As discussed earlier, prior to the reform, teachers taught from a textbook that provided all that was needed for the lesson. As such, the teachers were not required to create materials, find resources, design activities or plan their own lessons. The publishers of the textbook made the lesson plans and all of the materials required for each lesson, including audiotapes, visual aids and posters. The teacher guide that accompanied the textbooks outlined when and which visuals to show, which audiotapes to play and when each exercise should be completed. The exercises were provided in an accompanying student workbook.

The requirements of the reform have, for those who were interviewed, increased the teaching load and put considerable pressure on them as teachers. The teachers reported that the additional workload has impacted on their performance and their ability to create differentiated activities. One teacher said, “You can’t design different papers for different students all the time because you run out of time” [Teacher 8].

Without exception, the teachers felt that the implementation of the new curriculum for the reform had imposed a heavier timetable load. With the previous curriculum, teachers had at least four teaching-free lesson periods during a school day that could be used for preparing the next lesson. Prior to the reform, a full teaching schedule for a teacher, involved teaching no more than three classes per day with a double period one day per week, amounting to 21 teaching periods per week for the average teacher. Since the reform, the total number of teaching periods each week was between 24 and 28 periods a week.

The teachers felt that this increased workload left insufficient time to adequately prepare for lessons. They found it difficult to fulfil the teaching requirements stipulated by ADEC, as there was no sufficient time during the school day for the preparation and planning of lessons, resourcing materials and creating lesson activities. For example, one of the teachers said: “I have six classes. The only two classes I am free are the first and the third. I want to prepare my class now, but I don’t have time” [Teacher 7]. Another teacher said, “The workload is difficult; it’s the workload that I have, to grade papers and to find resources” [Teacher 12].

5.6.2 Resources and Teaching Materials

The interviews and lesson observations indicated that, in the new constructivist setting, many of the teachers had difficulty finding and recognising what constituted a suitable resource for teaching and learning. In the past, teachers were provided with posters and wall charts in conjunction with the textbooks. In some cases, the teachers said that they were waiting for this to happen: “sometime [the Administration] may provide me with the wall charts and pictures” [Teacher 1].

All of the teachers complained about the lack of resources and the difficulty that they had experienced finding suitable resources. Teacher 1 commented, “it is very difficult for me to find the appropriate materials for my students. Sometimes I resort to old textbooks. I read the lessons. I try to understand their objectives just to implement them in my classroom.” Another teacher felt that the teachers did not have the skills to find suitable resources, “Nobody taught me how to design a hand-out, how to find a suitable text or how to modify a text, or even where to find these resources”. Teacher 14 stated heatedly, “I hate getting resources. It’s not easy and we have to simplify them.” In many cases, the lack of skill in developing resources led the teachers to copy notes and teaching and learning materials from textbooks. Teacher 14 was very resourceful in that all whiteboard work was done on large sheets of A1 paper that were then posted on the walls after the lesson.

Seven of the 15 teachers did not view the development or sourcing of resources, activities and materials as part of their role. One teacher stated, “It’s not our job to find the text and to find resources. We only need the textbook to teach” [Teacher 11]. Another stressed, “I plan for the lesson, really! We don’t have a textbook; we don’t have resources. If [the education adviser] assists in these things it will work” [Teacher 15].

As a result of these factors, three of the classrooms (male teachers) were devoid of any student resource material; had nothing on the walls and had limited teaching resources. The other teachers had made an attempt to find some theme related pictures, vocabulary charts from the previous curriculum or, as one teacher had done, post the white board notes made during the lesson as wall charts. Nine of the teachers had put some examples of student work on the walls.

5.6.3 Lack of Support from the School Administration

Ten of the 15 case study teachers said there was a lack of support from the school administration teams (school leadership teams). It would appear that there were conflicting ideas about the requirements of the curriculum reform, what was expected of teachers and what practice should look like. Interviews with teachers suggested that school administrative staff were not always supportive of the required

changes. In three schools teachers had been asked to disregard new directives and to continue with the old ways. Teachers in two of these schools reported that they wanted to put up posters in their classrooms but the school administration forbade such action as the walls had been repainted and posters would distract the students from learning.

It would appear that some of this conflict was the need to ensure that students did well in the examinations. For example, one teacher said “the administration pressures teachers to make [the students] all pass ... the administration blames the teacher for any student not passing or poor results” [Teacher 15]. Poor student grades would often result, at worst, in teachers’ contracts being terminated at the end of the school year or, at best, in teachers being transferred, so there was a degree of fear that they would lose their jobs or be transferred to another school. One teacher, whose class had not done well on an examination, lamented having been transferred from a ‘nice school’ to one further into the desert: “Why do thy transfer me? I am an old person nowadays” [Teacher 1].

This pressure from the school administration on the teachers to ensure good examination results impacted on the implementation of the requirements of the reform. As one teacher said:

As the teacher, it is my role to test that the students have remembered the information. Do you know why? Because they have an exam at the end of the year and I have to prepare them for this exam. If they do not have all the information about this exam, they will fail. So I have to prepare them for that. **I** have to be in control, **I** have to do this. [Teacher 9]

Interviews with teachers also indicated that some school administrators did not give teachers access to photocopying facilities, making it difficult for teachers to duplicate teaching materials. One teacher commented:

(We) don’t have the right equipment here in the school to support one (photocopier), because you only have one office boy who is dealing with the

photocopier. In order to print more papers for the students you need a photocopier available all the time. I can do it myself but the room is always locked because we are not allowed to use it. [Teacher 8]

Many of the teachers reported that they were required to pay for copies of teaching and learning materials to be made outside of the school, and some stated that they asked students to have material copied for them. One teacher said, “I ask (my students) to bring different resources and to photocopy these for the whole class” [Teacher 8]. Four teachers reported being restricted to one ream of photocopy paper per class per trimester (12 to 14 weeks) and having to supplement any extra paper requirements out of their own money. All teachers reported paying for chart materials out of their own pockets.

5.6.4 Student Readiness

Major challenges that were highlighted by the teachers and the expert panel and evident through lesson observations were student readiness and student behaviour. Many of the teachers expressed that the change to collaborative work meant that students did not know what to do. For example, Teacher 15 said: “the students don’t understand what the groups are for.” An expert panel member commented, “there is an assumption that (the students) understand what is expected of them” [Expert Panel Member 3]. Another panel member supported this notion: “getting the students to change their classroom behaviour and expectations into becoming more active and participatory is difficult” [Expert Panel Member 2]. Other teachers explained, “it takes time for them (the students) to adjust to group work” [Teacher 4] and, “cooperative learning did not work with the all grades” [Teacher 11]. The reason given is that “students are not used to group work and use it to make a noise, to talk, not to work” [Teacher 11].

Another perspective on why student participation was difficult was made by an expert panel member who stated, “I think it goes against their nature, they don’t like sharing things, ideas, work because they see this as *the other person is going to be just as good as me and I won’t get the credit*” [Expert Panel Member 6]. Another teacher’s view was that “lots of students prefer to work on their own because they

felt that other students rely on them and don't do anything, so therefore, the excellent student will not get the recognition for the work" [Teacher 6]. To further complicate the issue, students seemed to lack understanding of group interaction, dialogue and discussion, resulting in them not fulfilling their expected role as part of a constructivist learning group. All lesson observations showed that students tended to work individually, even though sitting in a group structure, allowing weaker students to copy their work. One teacher felt that the students were too young to explore for themselves: "my students are too young, grade 7, to explore the factors themselves so I am doing this" [Teacher 15], thus supporting the traditional view of the teacher providing the facts.

Classroom observations indicated that although many of the teachers blamed the students for poor behaviour, in many cases the teachers lacked the behaviour management skills to manage students in a constructivist setting. For example in one class, when two of the students strayed off-task, the teacher tried to ignore them before moving them to separate groups. This resulted in disrupting the groups into which they had been moved rather than changing the behaviour. In the post-lesson interview the teacher explained that this strategy was "to encourage them by just talking to them and laughing with them" [Teacher 15]. One of the teachers admitted that he had a problem controlling groups but that the students needed to be trained for cooperative and collaborative learning. Another teacher explained the behaviour of her students as being "totally different from the way we (the teachers) were (at school) saying that, 'they cannot sit for a long time. They get bored easily. They're chatting all the time'" [Teacher 14]. The teacher admitted that she did not know what to do, other than to create activities to make lessons interesting (cut and paste activities) and thus keep students physically busy. Teacher 11 commented that the nature of the students in an outlying area of Abu Dhabi was quite different from the previous school in the city environment of Abu Dhabi. In this outlying environment, he said, the students were not really interested in learning because they know that "they (the school administration) pass students automatically even if they (students) don't attend the exam because the school administration pressures teachers to make them all pass and so why would the students care?"

5.6.5 Coaching and Mentoring

Eight of the 15 teachers had received coaching and mentoring over a two-year period (prior to this research being conducted) by education advisers attached to the schools. Lesson observations indicated that these eight teachers, (six female and two male), were more confident with group work in the classrooms; were seating students in groups; and attempting to facilitate lessons. In addition, all of these eight teachers had teaching and learning materials available to them as well as displays of student work in their classrooms. Further, five of these eight teachers had additional resource material such as reading books and additional activities on display so that students who had completed tasks could busy themselves with extension work. Expert panel member 6 noted that the role of the coaches and mentors in the school involved “supporting the teachers with the production of resources, giving the teachers access to resources, giving the teachers tools to better their lessons and introduce to them new ideas”; this was affected through collaboration with the teachers, modelling and demonstration lessons.

With the removal of the textbooks, the teachers expressed that they were at a loss as to where and how to find resources; they expressed their hatred of finding resources and were thankful to the coaches for their assistance in this area. Teacher 8 describes the change of pedagogy as “frightening and confusing. I had never tried this before”. All of the teachers who were interviewed expressed that when the reform was implemented, they did not know how to find and develop resources. To this end, Teacher 11 stated, “Nobody taught me how to design a handout, how to find a suitable text, how to modify a text or even where to find these resources”.

The eight teachers who had been working alongside education advisers all attributed their willingness to continue their attempts to implement the reform efforts to the advisers’ support. It would appear that the support given by the coaches encouraged the teachers to apply the new teaching strategies and approaches. One teacher stated, “it is very difficult to think about the activity ... [the coach] gave us the themes, the objectives, exposed us to poems, narratives, many things, even assessment criteria” [Teacher 9]. Another teacher said, “Things will not work, really! [I need help] when I plan a lesson, prepare the material, because we don’t have a textbook or the

resources” [Teacher 13]. Teacher 5 pointed out that she did not understand the new curriculum, describing herself as “not that creative and not a planner ... [but] following instructions of my coach, bit, by bit, I become more aware about what I am doing in the class and of the individuality of each student”. Finally, Teacher 11 identified the value of the coaches in helping them to grapple with the complexities of implementing the reform ideas, saying,

The coach can help me with extra work and activities for the stronger students. So having an extra competent person in the classroom helps in terms of training. The coach is a valuable asset for me. I can learn a lot from them.

One of the 15 teachers (Teacher 1) understood the complexity of language, stating insightfully that, “As Arabs we suffer a lot from learning the meanings of English words. I think you don’t understand because you are native speakers. Lack of knowledge of vocabulary hinders our understanding ... sometimes we resort to the Arabic equivalent to help us understand”.

Although the value of the coaches and mentors modelling best pedagogical practice and instilling confidence in the teachers cannot be disputed, the fact that the teachers continued to lack knowledge of the philosophy of constructivism and understanding of constructivist practice, and hold misconceived notions of constructivist terminology and practice, needs to be examined.

5.7 Chapter Summary

Chapter 5 reports the analysis and results that address research objectives 3, 4, 5 and 6. As a first step, the teachers’ ($N=182$) views of their implementation of constructivist practice (Research Objective 3) indicated that they perceived their pedagogical practice (choice of delivery, use of collaboration and of the physical environment) to be more constructivist than traditional. There was, however, a varied spread of responses to these aspects, ranging from seldom to almost always using constructivist practice. On the other hand, the teachers viewed their role as teacher and their philosophy of learning and knowledge acquisition to be more traditional than constructivist. The scale for role of the teacher had the smallest range of

responses, indicating that teachers seldom to almost never viewed their role in ways that are constructivist.

Similarly, the teachers' responses to their philosophy of learning and knowledge acquisition indicated that, although the responses were more varied, overall, teachers seldom thought of learning in constructivist terms. The teacher responses to items in this scale ranged from mostly to almost never believing they were using constructivist practice for this scale. In contrast, items related to the implementation of pedagogical practices (choice of delivery, collaboration in the classroom and the physical environment), teachers responded more positively, indicating that they viewed their classroom practice to be more constructivist than traditional.

This large-scale overview indicates that teachers' more traditional beliefs about their role as the teacher and about how students learned appeared to be in conflict with the teachers' views of what they were doing in the classroom (in terms of their choice of delivery, use of collaboration, and the physical environment). Further, the teachers' views of what they were doing in the classroom were not congruent with observations of their practice.

The relationships between the teachers' beliefs and their students' perceptions of the teachers' classroom practice (Research Objective 4), were examined using simple correlation and multiple regressions. The results of the simple correlations indicate that only eight of the 40 correlations were statistically significant ($p < 0.05$). The multiple correlation (R) indicated that all five of the teacher belief scales accounted for statistically significant ($p < 0.05$) amounts of variance in six of the eight learning environment scales. To interpret which individual teacher belief scales made the largest contribution to explaining variance in the learning environment, the regression weights were examined. Overall, only eight of the 40 possible relationships were statistically significant, indicating that the links between teachers' beliefs and their classroom practices were weak.

These results indicated that teachers' beliefs about their role as the teacher and about how students learned appeared to be in conflict with their views of what they were doing in the classroom. In addition, the teachers' views of what they were doing in

the classroom were not strongly correlated to the learning environment that they were creating (as perceived by the students), therefore the study went on to examine the translation of teachers' beliefs into practice, to explain any incongruence between the teachers' views of their implementation of constructivist practices and their classroom practice (Research Objective 5).

As a first step, a narrative of a case study teacher's lesson was provided to contextualise the information that was to follow. Observations portrayed in this narrative were not isolated to that teacher and it became clear during the interviews and subsequent observations that many of the teachers viewed themselves to be incorporating constructivist approaches in their practice, whereas in reality this was not the case. In this respect, many lessons tended to retain a traditional perspective that emphasised the recall of content.

Analysis of the qualitative data indicated that there were a number of factors that influenced the implementation of the constructivist practice. Although teachers expressed a willingness to implement the reform requirements, the data indicated that in many respects they lacked knowledge and understanding of constructivist practice and had formed misconceptions related to terminology. Further, teachers did not understand the role of teacher as a guide and facilitator or what this looked like in practice. There was evidence to suggest a lack of knowledge of the curriculum and how to interpret the document, including a lack of understanding of how to plan lessons, desired lesson outcomes and lesson objectives.

Interviews and observations indicated that the teachers' understanding of many educational terms related to constructivism were not congruent with their intentions. Four areas of conceptual interpretations were reported: understanding of what constituted learning; understanding of the term activities (to denote tasks that students undertake in a constructivist classroom); the concept of collaboration or group work in a constructivist classroom; and an understanding of what is meant by the term student-centred learning. Consequently, while the teachers were able to define these terms accurately in a way that was in keeping with constructivist philosophy, they did not implement them.

In addition to teachers' lack of knowledge, understanding and misconceptions of terminology, analysis of the qualitative data indicated that factors external to the teacher affected their implementation of the reform initiatives (Research Objective 6). These factors were: the workload and time constraints of the new curriculum for the teachers (which teachers cited as impacting on their ability to grasp and prepare for the reform requirement); the lack of readymade available resources and teaching materials for teachers; the lack of support from the school administration (who were cited as issuing instructions opposite to what had been requested of the teachers by the curriculum department); the students' lack of experience of a constructivist classroom and of their appropriate role and behaviour in it; and lastly, the role of coaches and mentors as advisers to assist the teachers in the implementation of the reform.

A discussion of the results is provided in Chapter 6.

Chapter 6

Discussion and Conclusions

Individuals can live, under one roof, without ever understanding one another, with no common language whatsoever. (Kapuściński, 2002, p. 90)

6.1 Introduction

The study reported in this thesis is framed by the post-positivist paradigm and involves an explanatory mixed-method design that was carried out in two phases. The first phase involved a large-scale collection of quantitative data, and the second phase involved a case study approach in which qualitative information was used to provide insights into the quantitative findings.

The collection of data for the first phase of the study involved the administration of two instruments, the newly developed Teacher Belief Survey (TBS) and the Constructivist-Oriented Learning Environment Survey (COLES). The TBS was used to assess five aspects: teachers' views about their role in the classroom; their philosophy of learning and knowledge acquisition; how lessons should be delivered (pedagogy); collaboration; and the physical classroom layout. The TBS was administered to middle and high school teachers ($N=198$). The COLES was used to assess students' perceptions of the extent to which constructivist-oriented practices were taking place in the classroom and was administered to students in one class taught by each of the 15 case study teachers.

The qualitative information was gathered from 15 case study teachers drawn from the nine participating schools. Information was gathered using classroom observations and semi-structured interviews (held before and after each of the lesson observations).

This chapter provides a summary the findings for each research objective and concludes the thesis. The chapter is organised using the following headings:

- Summary and discussion of major findings (Section 6.2);
- Educational implications of the study (Section 6.3);
- Limitations of the study (Section 6.4);
- Summary of recommendations (Section 6.5);
- Significance of the study (Section 6.6); and
- Concluding remarks (Section 6.7).

6.2 Summary and Discussion of Major Findings

This section provides a summary and discussion of the major findings, which is structured around the five research objectives: development and validation of the Teacher Belief Survey (Research Objective 1, Section 6.2.1); validation of the modified Constructivist-Oriented Learning Environment Survey to assess students' perceptions of their learning environment (Research Objective 2, Section 6.2.2); teachers' views of their implementation of constructivist practice (Research Objective 3, Section 6.2.3); relationships between teachers' beliefs about teaching and their classroom practice (Research Objective 4, Section 6.2.4); and the factors influencing teachers in their implementation of constructivist practices in classroom practice (Research Objective 5, Section 6.2.5).

6.2.1 Development and Validation of the Teacher Belief Survey

The first research objective was to develop and validate an instrument that could be used to examine teachers' beliefs about teaching and their role as the teacher. The purpose of the Teacher Belief Survey (TBS) was to provide an indication of whether a teacher's classroom practice was guided by traditional or constructivist beliefs.

The development of the TBS entailed a five-step approach. First, a review of literature related to the traditional and constructivist paradigms was undertaken with respect to the philosophy of learning and acquisition of knowledge and expected

pedagogical approaches for the classroom. Second, suitable scales were delineated and defined, and items were written. Third, the five new scales (the role of the teacher; teacher's philosophy of learning and knowledge acquisition in the classroom; pedagogy, choice of delivery; collaboration; the physical environment; and assessment) with the items were assessed by an expert panel for clarity, understanding, accuracy and relevance. Fourth, the TBS was translated into Arabic using a back translation. Finally, the TBS was field tested with a selection of teachers who had similar demographics to those who would be included in the main sample.

To provide evidence for the validity and reliability of the TBS, data collected from 198 teachers was used to examine the factor structure, internal consistency reliability, discriminant validity and concurrent validity. The major findings were:

- Item analysis resulted in the omission of 31 problematic items.
- After omission of the problematic items, all items, with the exceptions of one, Item 12: philosophy of learning scale, had a loading of at least 0.30 or 0.40 on their own scale and less than 0.30 or 0.40 on all other scales. The exception loaded at least 0.40 on both the teacher's philosophy of learning and the role of the teacher scales. It was retained as its removal was found to weaken the internal structure of the philosophy of learning scale.
- The internal consistency reliability, using Alpha coefficients, was generated for each scale. The scale reliability estimates ranged from 0.71 to 0.83 for the five TBS scales. The relatively high alpha reliability for each scale (the lowest of which was 0.71 for the choice of delivery scale) suggested that the items in each scale assessed a common concept and met the conventionally accepted cut-off point of 0.70 for satisfactory internal consistency reliability.
- The ANOVA results indicated that scales of the TBS were able to significantly differentiate statistically between teachers in different schools.

While much has been reported in the literature on teacher beliefs as well as the identification and description of various beliefs (such as self-efficacy beliefs, cultural beliefs and pedagogical beliefs), few instruments exist to assess teachers' beliefs.

Although a review of literature identified surveys that had been developed to target specific subject domains or cultural groups (see for example, Dellinger, Bobbett, Olivier & Ellett, 2008; Hachfeld et al., 2011; Luft & Roehrig, 2007; Mavrikaki & Athanasiou, 2011), this review only located one instrument that, similar to my own, was designed to assess teachers' beliefs related to constructivism and behaviourism (Benjamin, 2003). This on-line survey was found not to be suitable for my research as it targeted American teachers, particularly new teachers as they progressed through professional development programs. Further, the survey had not been published.

Given that research related to teachers' beliefs has, according to Hachfeld et al. (2011, p. 197), been "hampered by the lack of instruments assessing these beliefs in an education context", the development of such an instrument is timely. Further, the dual language version of the TBS makes it available for use in other settings. As such, the instrument could be used to help determine teacher professional development requirements with respect to constructivist knowledge and classroom practice. Importantly, these results provide strong evidence to support the reliability and validity of the TBS when used with this sample; therefore, the findings generated to address subsequent research objectives can be interpreted with confidence.

6.2.2 Translation and Validation of Learning Environment Survey

The second research objective involved the validation of the Constructivist-oriented Learning Environment Survey (COLES) to assess students' perceptions of their learning environment. Data collected from 397 students in 15 classes was used to examine the reliability and validity of the Arabic version of the COLES in terms of the factor structure, internal consistency and reliability and discriminant validity. The major findings are reported below.

- The items in three of the scales were found to be problematic (equity, young adult ethos, and task orientation) and were omitted from all further analysis.
- With the exception of three items, all 48 items in the remaining eight scales had a loading of at least 0.40 on their own scale and less than 0.40 on all other scales. The exceptions were: item 28 for the formative assessment scale

(which loaded on the personal relevance scale as well as its own scale); item 39 of the involvement scale; and Item 62 of the differentiation scale (both of which loaded on their own scale as well as the cooperation scale).

- The Cronbach alpha coefficients ranged from 0.87 to 0.92 for the individual as the unit of analysis and from 0.87 to 0.98 for the class mean as the unit of analysis. This indicates that the items within each scale of the COLES assess a similar construct.
- The ANOVA results were statistically significant for all scales, suggesting that the scales of the COLES could differentiate between classes.

These results provide strong evidence to support the reliability and validity of the eight remaining scales of the COLES (after the omission of problematic items) when used with this sample. Although research within the field of learning environments is relatively new in the Middle East, there have been some studies that have used various versions of the What is Happening in this Classroom (WIHIC), from which many of the scales of the COLES originated. The evidence provided to support the reliability and validity of the COLES in my study was similar to findings with Arabic versions of the WIHIC when used at the tertiary level in Jordan (Al Zubaidi & Aldridge, 2016) and in Abu Dhabi (Afari, Aldridge, Fraser & Khine, 2013). The results of this study provide further evidence to support the use of the Arabic version in the UAE and are favourable when compared to other studies that have used it at the high school level (MacLeod & Fraser, 2010). Further, the reliability of COLES in this study compared favourably to other studies that have used the English version of the COLES (see for example, Aldridge, Fraser Bell, & Dorman, 2012).

6.2.3 Describing Teachers' Views: Responses to the TBS

The third research objective sought to describe teachers' views of the implementation of constructivist practice based on their responses to the TBS. In addition to the mean scale scores and standard deviation, a box and whiskers plot was used to examine the variation between responses. The results are summarised below.

- The range of teachers' responses to items in the role of the teacher scale was small by comparison to the other scales, ranging from *seldom* to *almost*

never (ranging between approximately 4 and 5). The mean response to this scale was close to *almost never* (approximately 5), indicating that teachers held more traditional beliefs about their role in the classroom.

- Teachers' responses to items in the philosophy of learning scale ranged from *seldom* (approximately 2) to *sometimes* (approximately 3), with a mean response that was close to *seldom* (approximately 2), indicating that their philosophy of learning tended to be more traditional than constructivist.
- For the remaining three scales, choice of delivery (pedagogy), collaboration and physical environment of the classroom, the responses involved a wider range from *seldom* to *almost always* (approximately 1 to 4). The mean response for this scale was close to *mostly* (approximately 2), indicating that teachers viewed themselves as using constructivist practices in their classes.

Despite the reform efforts over the four years prior to the time this research was conducted, the results indicated that the teachers continued to hold more traditional beliefs about their role as the teacher and their philosophy of learning and knowledge acquisition. Given the findings of Dunn and Rakes (2011, p. 42), who remark that “where teachers have in the past experienced success in teacher centred processes (i.e. direct lecture, rote memorisation) they are unlikely to implement learner centred practices suggested by reform advocates,” this finding may not be surprising. Further, my findings corroborate those of other researchers, such as Bakkenes et al. (2010), who reported finding changes in teachers' knowledge and emotions but “hardly any changes in teaching practice” (Bakkenes et al., 2010, p. 545), and Savasci and Berlin (2012), who found teachers' perceptions of their “implementation of constructivism in their classrooms to be greater than their observed practice” (Savasci & Berlin, 2012, p. 78).

A number of reasons may be cited as contributing to these strongly held traditional beliefs and practices, some of which are discussed in subsequent sections. However, what was surprising was that despite these more traditional beliefs, teachers responded to the remaining scales (related to their views of their classroom practice)

in ways that were more constructivist. This point is examined further in the next section.

6.2.4 Relationships between the Learning Environment and Teachers' Beliefs

Simple correlation and multiple regression analysis were used to examine the relationships between students' perceptions of the learning environment and teachers' beliefs. The findings are summarised below.

- For the simple correlation, eight out of 40 possible relationships were statistically significant.
- Statistically significant relationships existed between:
 - The teachers' view of their role and students' view of teacher support, clarity of assessment criteria, and cooperation. For all of these, the relationship was negative.
 - The teachers' philosophy of learning and students' responses to the cooperation scale. This relationship was negative.
 - The teachers' choice of delivery and students' responses to the personal relevance scale. This relationship was positive.
 - The teachers' perceived use of collaboration and five of the learning environment scales (shared control, teacher support, formative assessment, clarity of assessment, personal relevance and differentiation). All of these relationships were positive.
- There were no statistically significant correlations between the physical environment scale and any of the learning environment scales.

The interpretation of some of these statistically significant correlations made intuitive sense. For example, when teachers viewed themselves as implementing more collaboration, the students perceived increased personal relevance and differentiation. Also, the statistically significant and negative correlations were telling. For example, when teachers viewed their role in the classroom as more constructivist, students perceived more teacher support, clarity of assessment and cooperation. Overall, however, the correlations were not strong. That is, although

teachers (based on scores on the TBS) indicated that they were implementing constructivist practices, including their choice of delivery, use of collaboration and physical environment, the students' responses did not necessarily reflect this. This finding provided support for the anomaly found in the previous research objective, in which teachers' beliefs about their role in the classroom and philosophy of learning acquisition of knowledge were more traditional, but their view of the practices used in the classroom were more constructivist. This lack of implementation of intended reform initiatives have been reported in numerous studies carried out in other countries (Fisher, 2006; Kleve, 2004; Muofhe, 2001; Ogan-Bekiroglu & Akkoc, 2009; Roehrig & Kruse, 2005; Savasci & Berlin, 2012; Şeker, 2011a; Snider & Roehl, 2007; Vermunt & Endedijk, 2011). In many of these studies, teachers were reported to be positive about the reform but showed little evidence of the practices required by the reform. Muofhe (2001) also noted that even the teachers who seemed to have embraced the change had great difficulty "in leaving the traditional approach to teaching" (Muofhe, 2001, p. 32).

The next section discusses the results of the fourth research question, which examined some of the reasons for the incongruence between the practices reported by the teachers and that, which was observed.

6.2.5 Incongruence between Expected and Observed Practice

The findings, summarised below, help to explain the incongruence between the teachers' believed practice and that, which was observed:

- Interviews indicated (as reported in the TBS) that teachers' views of the role of the teacher and philosophy of learning and knowledge acquisition were, by and large, more traditional than constructivist.
- Teachers were ill equipped to implement aspects of the reform (such as the development of lesson plans and learning materials).
- Teachers lacked knowledge and understanding of the constructivist approach, particularly with respect to:
 - Their role in a constructivist classroom;
 - The curriculum that they were implementing; and

- The meaning of lesson outcomes and objectives.
- Teachers' held misconceptions of terminology commonly used with respect to the constructivist pedagogy. The most common misconceptions were related to:
 - What constituted student activities or tasks for a constructivist classroom;
 - The concept and use of group work and collaboration for a constructivist classroom; and
 - The meaning of student-centred learning in a constructivist classroom.

The results indicated that teachers lacked knowledge and understanding of constructivist philosophy and associated pedagogies and held onto the beliefs of their role and philosophy of learning that had served them well prior to the reform. The meanings that teachers attached to concepts related to constructivism were not aligned with constructivist interpretations, that is, they held misconceptions of much of the constructivist terminology. Further, many of the teachers did not have the necessary skill sets required to implement the new curriculum (such as behavioural management and lesson preparation skills). Each of these findings is discussed below.

6.2.5.1 Teachers' Beliefs about their Role and Philosophy of Learning

Analysis of the qualitative information reflected the teachers' scores on the TBS for two of the scales. In both cases, the qualitative data found that, by and large, teachers viewed their role in the classroom and their philosophy of learning and knowledge acquisition in ways that were more traditional than constructivist. In the past, teachers in Abu Dhabi implemented decisions that had been made at higher levels and followed decrees from the Ministry of Education (MoE). Previously, the MoE provided principals with a rulebook and all decisions were made within the guidelines of this book (Koorey, 2009). Teachers were not in a position to make any decisions regarding curriculum content or pedagogical approach. Prior to the reform, a textbook curriculum was used, in which teachers were responsible for covering the curriculum (by completing the relevant sections of the textbook as prescribed). The teachers were responsible for keeping the classroom quiet and orderly. There was no

emphasis on diagnosis for learning or as learning and teachers were not responsible for choosing which resources to use, which tasks to design or how students would go about learning or mastering the material (Boghossian, 2006; Bichelmeyer & Hsu, 1999; Taylor, 1990). Therefore, the notions of freedom, responsibility and decision-making, all of which were required for the introduction of a constructivist curriculum, were both new and foreign to these teachers.

The teachers who were interviewed were generally unsure about what their role entailed in a constructivist setting and were confused about the role of a facilitator or guide. In many cases, this confusion was coupled with a degree of frustration and anger at no longer being recognised as a teacher. My findings support past research which has suggested that the identity of being a teacher lies deep within a person, and is linked to who they are (Lastica, 2009). Moreover, asking teachers to change their role in the classroom (as expected when shifting from a traditional to a constructivist approach) might threaten a teacher's authority and, thus, their status in the eyes of the students and the community (Orafi & Borg, 2008). In both cases, teachers would be discouraged from making such a change, as Tsai (2002) suggests.

The challenge that teachers face as they attempt to change their role in the classroom, could also be affected not only by the education culture of the area, but also by the social culture. The expectation that the individual must now decide for himself and his students may be daunting for many of these teachers. These findings are supported by the framework proposed by Hofstede (1980) where distance reflects an acceptance of an unequal distribution of power without questioning, a factor regarded as normal in the Arabic culture. In the past any directive came not from the principal whose role it was to disseminate these, but from the Ministry of Education. Rugh's (2000) observations of the Middle East and North Africa (Arab and Muslim nations) is that they do not reward or value the skills "enabling workers to be flexible, to analyse problems and to synthesise information gained in different contexts (because) this requires focussing students on the process of learning, on learning how to learn as well as the particular subject content" (Rugh, 2000, p. 407). This helps to explain Maryam's statement "We are Arab and Muslim. We have our own way of teaching our children".

Grosser and Lombard (2008, p. 1364) reported that when individuals are raised in a society which promotes curiosity, diversity, personal freedom, debate, and choice, as in the Western culture, it will be “characterised by analytic thought” (Grosser & Lombard, 2008, p. 1367). However, the worlds of the teachers who have not been raised in such a society may not be prepared “for the execution of critical thinking abilities”. Further, Ayisi (1992) found that in African culture, thinking is governed by a sense of collective agency; that is, individuals are encouraged to learn through imitation “not by questioning but by observing and following the practices of older peers and adults in the community” (Nelson Mandela, as cited in Grosser & Lombard, 2008, p. 1368). This could go some way to explaining why the teachers, who were expected to design resource materials, tasks or activities, felt incompetent to do so and did not regard this as part of their duty.

My findings also suggest that the teachers’ philosophy of learning remained largely traditional in terms of learning and knowledge acquisition. This finding corroborates the findings of other research that examined the implementation of constructivist approaches (Chai, 2010; Savasci & Berlin, 2012). Further, teachers felt that learning and knowledge were largely related to the memorisation of facts, which was a similar finding to Richardson’s (2003) study that examined teachers in the Middle East.

The traditional beliefs might also be strongly embedded because teachers will have experienced success in the traditional educational environments that they were used to. Similar observations were made in Taiwan (Tsai, 2002) and South Africa (Stoffels, 2005), where teachers continued to teach, “in the conventional teacher-centred way, choosing what they felt comfortable and familiar with” (Stoffels, 2005, p. 534). It is also possible that the teachers’ reluctance to move from more traditional beliefs was compounded by the pressures applied to teachers to produce high test scores, encouraging them to “prioritise fact memorisation at the expense of standards-based instruction” (Anderson, 2007, as cited in Milner et. al, 2011, p. 5). Not only is this an epistemological belief held by the teachers but it is further entrenched because of past practice and successes, which contributes to the difficulties in implementing reform initiatives.

The beliefs that teachers held about learning and knowledge acquisition were likely to have impacted on their classroom practices, which would account for why the teachers were generally observed to be practising more traditional, didactic teaching. It is recommended therefore that teachers attend professional development courses prior to and during the implementation of the reform, and that these courses address the meanings and understandings of the philosophy and pedagogy of the reform initiatives (*Recommendation 1*).

Whilst these findings help to explain why the practices that were observed were more traditional, they did not explain why teachers perceived (as evidenced in the survey and during interviews) their practices to be in line with the reform requirements. The next sections discuss the findings related to this.

6.2.5.1 Lack of Knowledge and Understanding

My findings indicated that teachers lacked the necessary knowledge and understanding to successfully implement a constructivist curriculum. Teachers' lack of understanding and skills, past experience, and the lack of formal professional training were found to create challenges. These findings are similar to other research carried out in Middle Eastern countries, in particular Jordan (Alkhaldeh, 2010), Turkey (Kirkgöz, 2008; Şeker, 2011a) and Libya (Orafi & Borg, 2002). These findings also were similar to those in countries outside of the Middle East, including, Taiwan (Tsai, 2002), South Africa (Roelofs & Terwel, 1999; Stoffels, 2005), Thailand, (de Segovia & Hardison, 2009) and Papua New Guinea (Education, 2006). It is interesting to note that most of the research with results similar to mine was carried out in non-Western countries where there had been large scale reform with an immediate transition from a traditional approach to a constructivist one.

It is not surprising, particularly in systems that were entrenched in the traditional approach, that teachers without prior training, relevant knowledge or skills would find the curriculum, lesson planning and the setting of objectives difficult to implement. Firstly, the role of the teacher required a fundamental change, as a constructivist teacher needs to be a diagnostician, challenger and model as well as to monitor, guide and facilitate student learning and to reflect on students' learning

processes (Bakkenes et al., 2010). Teachers who do not have the skills, understanding or knowledge are unlikely to be able to implement the initiatives required and will revert to their known, tried and trusted methods.

To compound this problem, at the time of writing this thesis, less than 35% of the Arab teachers in Abu Dhabi had a professional teaching qualification and therefore may have been “ill-equipped to implement that which challenges their beliefs and experiences, and threatened their authority” (Orafi & Borg, 2009, p. 252). The lack of suitable professional training would contribute to their low pedagogical literacy, as their teaching experience was based largely on their years of textbook teaching and prior experience. This helps to explain the problems that teachers had with respect to lesson planning, sourcing materials and resources for teaching, and understanding education philosophies and pedagogical strategies. In the absence of suitable professional training, it is not surprising that the teachers had difficulty understanding the new curriculum. In addition, the lack of suitable preparatory training prior to the introduction of the education reform, as was found in past research in Jordan, compounded “the gap between what the teacher receives as knowledge and skills during university study and the reality of teaching in school, and the absence of education preparation of teachers” (Alkhawaldeh, 2010, p. 852). It is recommended, therefore, that in the future, the government considers hiring only teachers who have a recognised professional qualification (*Recommendation 2*).

In addition, the traditional teaching methods modelled to teachers during their own education were likely to have impacted on their views of what a classroom looks and sounds like. Many reports show that teachers are likely to teach in the same manner in which they were taught and that the idea of what teaching should look like was entrenched during these earlier school years (Grossman, 1990; Mead, 1992; Raymond & Santos, 1995). Wheatley (1999) reminds us “we all construct the world through lenses of our own making and use these to filter and select” (1999, p. 65). It is possible, therefore, that the teachers were filtering and selecting the information given to them about the reform with the hope that they would be able to “manipulate the system for the outcomes desired” (Wheatley, 1999, p. 43). Argyris and Schön (1974, as cited in Fisher, 2006) postulate that the truth is that the professional

practice that the teacher espouses to believe is different from the theory-in-use, and regardless of what is said, the belief influences a teacher's practice.

My findings that the teachers appeared to lack the pedagogical knowledge required for the reform efforts are similar to research in Papua New Guinea (Deakin University, 2006) and South Africa (Roelofs & Terwel, 1999; Stoffels, 2005). According to Fullan and Ballew (2001), implementers of curriculum reform often assume that teachers have the pedagogical understanding and qualifications that the reform initiatives require. Further, de Segovia and Hardison (2009) suggest that a lack of knowledge such as that experienced by the teachers who were interviewed, might create the gap between the rhetoric and reality (de Segovia & Hardisan, 2009); hence teachers say and believe they are doing what is required when in reality they are not. It is recommended, therefore, that teachers' pedagogical beliefs and knowledge be surveyed and professional development designed to ensure common understanding and practice as required by the reform initiative (*Recommendation 3*).

My findings indicate that the teachers' knowledge and understanding (or lack thereof) of the pedagogical requirements led to the implementation of visual or superficial aspects of constructivism (for example, having students sitting in groups as had been described to the teachers during professional development sessions). These findings corroborate those of Shulman and Shulman (2004) and Tam (2000) who suggest that a lack of knowledge is likely to affect teachers' interpretation of the curriculum and consequently their classroom practice. Fullan (1999) commented that after 10 years of National Curriculum implementation in Ontario, many teachers' ways of working had not changed. The teachers argued that this was a technical innovation that was imposed on them. Fullan (1999) explains that in such a situation the response is to 'bolt-on' each new development to existing and familiar practice in order to give the appearance of compliance with the reform endeavours. It is possible that this lack of knowledge and understanding was compounded by few teachers having formal professional training.

My findings suggest that although education advisers have been working alongside these teachers as coaches to help teachers to implement the reform requirements, further intensive professional development is needed to up-skill and educate the

teachers with respect to the constructivist philosophy of education and associated pedagogy (*Recommendation 4*). Further, the type of professional development used to up-skill teachers needs to be carefully considered. Currently, much of the professional development provided does not involve current adult learning theory and contemporary models of professional development. Furthermore, the professional development does not take into consideration the teachers' deeply held beliefs about teaching (*Recommendation 5*). This point is discussed further below.

6.2.5.2 Misconceptions of the Terminology

My finding that teachers thought that they were implementing the reform initiatives when in reality, observations indicated that they were not, supports those of past studies (see for example, Kleve, 2004; Meirink, Meijer, Verloop, & Bergen, 2009). My findings suggest that this incongruence between what the teachers thought was constructivist practice and what was observed was in part due to misconceptions of the terminology related to constructivism. Although, when questioned, teachers gave the impression that they understood the reform requirements, in reality their understandings were incorrect. For the majority of teachers there was neither a common language nor a clear understanding of what the reform required.

Sewell (2002) emphasises how one's pre-existing knowledge creates the foundation upon which any new knowledge is constructed. The new knowledge, she argues, can only be retained if it can be fitted with the existing knowledge. Research shows that teachers filter information with existing understanding (Alger, 2009; Fives & Buehl, 2008; Karavas-Doukas, 1996; Önen, 2011; Pajares, 1992) and interpret much of the new terminology within their existing knowledge frameworks. It follows therefore that the teachers who were interviewed had filtered the new terminology according to their existing understandings of teaching practice. For example, group work was often interpreted as a group of students sitting around a table working. Similarly, activities were interpreted as exercises designed to keep students busy and discussions were interpreted to mean students sharing their work with others. My findings corroborate those of studies carried out in Taiwan (Tsai, 2002) and South Africa (Roelofs & Terwel, 1999; Stoffels, 2005), which found that few teachers who had been entrenched within the traditional approach to teaching had constructed

relevant conceptual frameworks of a constructivist classroom. Further, Stigler and Hiebert (1999, p. 162) suggest that “the language of the teachers and the language of the reform may appear to converge but the convergence is superficial”. Yerrick et al. (1997) observe that the teachers use the new language of the reform curriculum without any change in their underlying beliefs and understanding and therefore no resultant change in behaviour.

My review of the literature indicated that with the exception of one study, many studies that examined the challenges faced by teachers during education reform did not identify teachers’ misconceptions as one of them. The exception, a study in Turkey (Kirkgöz, 2008), found that teachers’ understanding influenced their implementation of curriculum reform initiatives. In other cases, such as a study in Lybia (Orafi & Borg, 2008) in which the reform initiatives were found to be “incongruent with the cognitive and contextual realities of teachers’ work” (Orafi & Borg, 2008, p. 243), the possibility of misconceptions has not been identified. Given my findings, it is important that during reform efforts, professional development providers examine more closely the conceptual understandings of the teachers rather than assuming a common understanding (*Recommendation 6*).

My findings indicate that one cannot assume a common understanding of the reform requirements; therefore, it is important to ascertain precisely the meanings teachers attach to the concepts, terminology and philosophy of the curriculum being implemented to verify whether these interpretations are in line with the reform. It is recommended, therefore, that reform agents ascertain what teachers and school administrators know and how they understand and interpret the reform requirements, paying particular attention to their conceptual interpretations (*Recommendation 7*). Further, it is recommended that professional development providers consider meaningful ways to address these misconceptions (*Recommendation 8*).

My findings indicate that the incongruence between teachers’ perceived practice and that which was observed might also be attributed to the culture of authority and compliance inherent in Abu Dhabi. Teachers who were interviewed remained, by and large, traditional in their beliefs about their role and in many cases, were unclear of the expectations of a facilitator and guide. Given the society in which these teachers

lived and that the system of teaching that they were used to (which was based on an authoritarian role in which the teacher controls, directs and gives the information and students obey, listen and memorise) this finding was not completely unexpected. These findings are similar to those of other studies in which teachers were found to be more comfortable in their previous role when they were in control (see for example studies carried out in Africa by Ayisi, (1992) and Grosser & Lombard (2008).

My findings indicate that the teachers involved in the study wanted detailed day-by-day and step-by-step lesson plans. These findings were similar to those of a study in Papua New Guinea, where reform implementers found that initially, the teachers did not understand the reasoning behind the lesson planning and lacked the skills to develop them for themselves (Deakin University, 2006). In the case of Papua New Guinea, detailed step-by-step lesson plans were provided with intensive scaffolding to help teachers to learn what the constructivist lesson should look like as well as details of the activities that would assist students to construct knowledge and understanding. Given my findings, that unless teachers understand and know how to implement the new curriculum, teachers are more likely to revert to their previous practices, it is, therefore, recommended that teachers be provided with more intensive scaffolding and assistance in the translation of the curriculum into practice (*Recommendation 9*).

Conceptual interpretations, knowledge and understanding are not the only areas of change required of teachers in reform that requires a shift of paradigm and an accompanying change of philosophy. As reported, the teachers in Abu Dhabi also need to make a cultural change to their beliefs about their role and what is expected and required of them in the classroom, and a change in work ethic and responsibility. Embedding such changes in practice will take time, with much support from the school leadership team and coaches and mentors. This introduces the external factors that play an important role in the teachers' implementation of reform initiatives. These are discussed below.

6.2.6 Factors External to the Teacher

Several factors were found to be outside of teachers' control (therefore categorised as being external to the teacher). These were similar to those voiced by teachers in both Western and non-Western countries where they were required to implement curriculum reform initiatives. The findings are summarised below and discussed in the subsequent subsections.

- The workload for teachers had increased since the introduction of the reform efforts, leaving them with limited time to meet the demands of preparing materials and lessons required for a constructivist approach.
- The non-provision of teaching resources and prepared teaching materials resulted in teachers downloading and sharing worksheets from internet sites as activities for students.
- A lack of support by the school administration led to teachers reverting to their previous traditional methods for fear of being reprimanded or dismissed.
- The lack of readiness and knowledge of how to assist students to participate in a constructivist classroom led to behavioural problems and, in some cases, to unresponsive or unruly students.
- The role of coaches and mentors as advisers was viewed as positive, with the support they provided impacting positively on teachers' confidence as they implemented their classroom practice.

6.2.6.1 Workload and Time Constraints

My findings indicated that since the reform, there had been an increase in both contact teaching time and administrative and other duties for the teachers. This increased teaching load left limited time for planning and designing suitable constructivist lessons and activities and to search for appropriate resources and teaching materials. Given that teachers (as explained in the previous section) were also expected to absorb and understand the new curriculum, which, as with any learning process, takes time, the problem was further compounded.

My findings about the time constraints causing an intensification of workload was also identified as problematic in other studies around the world that have examined education reform; inter alia, Alkhaldeh (2010, Jordan), Cheng (2009, Asia-Pacific), Hooghart (2006, Japan), Kirkgöz (2008, Turkey), Lee (2008, Hong Kong), Lin & Chan (2007, Singapore), Stoffels (2005, South Africa and Wang (2011, rural China). Hooghart (2006) warns “this intensified workload may limit teachers’ efforts at local curriculum design” (Hooghart, 2006, p. 297). Further, Lim and Chan (2007) point out that not only do constructivist activities take time to construct, but their implementation is time-consuming and is often regarded by teachers as impractical to implement. Wheatley (1999) argues that organisations need to support teachers to reflect on the new information and to provide “them with the resources, time, colleagues and reflection ... (because) teachers need collaborative and curriculum development time” (Wheatley, 1999, p. 108).

Given that learning takes time, it is unrealistic to assume that teachers will be capable of speedily learning and implementing a constructivist approach. It is important, therefore, that administrators and policy makers consider carefully the workload of teachers during this period to ensure that they have sufficient time to learn, reflect upon and understand the requirements and philosophies of the new curriculum (*Recommendation 10*).

6.2.6.2 *Lack of Teaching Resources and Prepared Teaching Materials*

My findings indicate that the teachers felt that they lacked appropriate teaching and learning resources to help them to implement the reform requirements. Given that prior to the reform, teachers were provided with a textbook that included all of the resources and materials required, this was an important point. The teachers, unused to preparing such materials, were, in many cases, unsure of what resources were required and in many respects, what the new curriculum looked like in practice. This finding is similar to findings in Papua New Guinea, South Africa and Middle East regions, where the teachers had traditionally relied on commercially prepared instructional materials (Stoffels, 2005). The challenge of resources was also cited as being problematic in the US, Norway and The Netherlands, with almost half of the teachers surveyed indicating their desire for a prescriptive curriculum, which they

saw as the best opportunity for student learning. The reliance on such prescriptive teaching “rather than tailoring instruction to fit the individual child” is, however, inconsistent with constructivism (Snider & Roehl, 2007, p. 884).

My findings indicate that since the textbooks had been removed, there was a shortage of suitable materials and that the teachers need support to develop appropriate resources, strategies and materials so that they are in a better position to comply with the reform requirements. It is therefore recommended that when an education reform involving such a paradigm shift as the one taking place in Abu Dhabi is introduced, teachers should be provided with detailed resources (including lesson plans as described above) to assist them in their shift from a traditional to a constructivist paradigm. Changing practice in a sustainable and significant way “will require teachers to learn not only the new subject matter and new instructional techniques, but will require them to alter their beliefs and conceptions of practice and their theories of action” (Muofhe, 2001, p. 31). This is unlikely to happen through reading or lecturing but rather through prescriptive scaffolding detailing precisely what students should be doing and what the teacher’s role is (*Recommendation 11*).

6.2.6.3 *Support from the School Administration*

Principals and the school leadership teams are recognised as playing an important role in the successful implementation of a curriculum. My findings are that teachers cited a lack of support by the school administration as a common factor that influenced their ability to implement the curriculum. Because the principal and school leadership team are responsible for renewing the teachers’ contracts, they wielded much power over the teachers. In cases where teachers felt that the school leadership team wanted them to continue to teach in a more traditional manner (perhaps because they did not understand the new curriculum and its associated pedagogy), teachers were less likely to implement the requirements even at a superficial level.

My findings were similar to those of Adams (2006), in that where the school administration judged teacher performance by test results, teachers continued to teach in the manner with which they were familiar because of their fear of the power

of the school administration in relation to job security. Similar findings were recorded by James and McCormick (2009, p. 977): "... teacher and pupils alike worked in a system dominated by the demands of the curriculum and examinations. The pressure was to cover the course or teach to the test rather than take the time to explore pupils' ideas and understanding." Taylor (1990, p. 20) reports that in a more decentralised role, a teacher's beliefs often conflict with his "established belief that shaped his former centralised teaching style." This conflict in belief between the traditional and constructivist education approaches, that is, ensuring that all content has been covered as opposed to the student learning and mastering skills, epitomises the quandary that faces teachers as they come to understand the new curriculum and trust the new formal assessment techniques.

My findings supported past studies, which found that a key factor for successful classroom change was support by school management (James & McCormick, 2009; Lim & Chan 2007; Milner et al., 2011; Roehrig, 2005). According to Fullan (2006, p. 116), "if you want to change people's behaviour you need to create a community around them, where these new beliefs could be practiced, expressed and nurtured." Given that teachers need to feel safe in their professional environment, particularly during a time of experimentation and learning which accompanies reform, it is recommended that school leadership teams be provided with professional development and, where appropriate, training related to the new curriculum so that they may better support the teachers (*Recommendation 12*).

6.2.6.4 *Knowledge and Readiness of Students to Participate in a Constructivist Classroom*

A finding that was surprising and that has not been commonly identified in past research was that of the readiness of the students to play their part in a constructivist classroom. Research generally noted students' poor behaviour and lack of responsibility or willingness to participate, but little research focuses on the students' understanding of the role expected of them in a constructivist classroom. Perkins poses a relevant question: "Why does there appear to be almost no concern for the entry behaviours of students? A constructivist learning experience may not look welcoming. It may seem dauntingly complex" (Perkins, 1991, p. 19). The

assumption exists that with the implementation of radical curriculum change, the students are able, willing and ready to participate. As with the teachers, it would appear that the students did not understand the new expectations placed upon them in the classroom. Their behaviour too, had been conditioned through their experiences in the traditional classroom. The communities from which the students came had for the most part only experienced a traditional approach to teaching, thus parents and communities were not in a position to assist or encourage their children with respect to the students' new roles in a collaborative, constructivist environment.

Teachers complained of the lack of cooperation of students, particularly the boys. Many of the behaviours required for a successful constructivist classroom were considered taboo in a traditional classroom (such as dialogue with others, group sharing and interaction). Students expected a didactic, passive classroom. To manage the new group dynamics, teachers need a whole new set of behaviour and group management skills.

My findings corroborate those of English and Kitsantas (2013), who comment that, for constructivist classrooms, students must become responsible for their learning and actively participate in the construction of knowledge and meaning making. However, for many students this role conflicts with deeply ingrained habits as passive recipients of knowledge; that is, "in order for potential student centred approaches to be realized, students must make the shift to their new roles as active learners" (English & Kitsantas, 2013, p. 129). Similarly, Lim and Chan (2007) reported on the lack of readiness of students in Singapore for constructivist approaches. Wang (2011), researching on education reform in rural China, reported that teachers blamed students for being of low quality and backward and could not adapt to and master fancy new learning methods. Savasci and Berlin (2012) reported that the students' behaviour and ability was one of the most frequently reported challenges facing teachers in their implementation of constructivist practice.

It takes a skilled, knowledgeable teacher to encourage and assist students to participate in a collaborative environment. The teachers involved in my study were themselves learning about a constructivist classroom. It would seem unfair to expect them to also train the students on how to participate in such an environment,

particularly when the students attend many other subject lessons where the traditional criteria are the *modus operandi*, so that they receive muddled and mixed messages.

In USA, Alger (2009) identified American students as being problematic, but, in the sense that they were not willing to participate, rather than that they did not understand what was required and expected of them. She reported that a lack of student preparedness and of respect for teachers hampered their teachers from teaching the way they'd like to. Teachers noted that they had to change their conception of teaching in response to students' low level of preparedness for their course. A teacher with 20 years of teaching experience was reported to have started with the notion of 'guiding' but described her teaching today as 'transmitting', and summed it up as "a general lack of preparedness and enthusiasm to learn on the part of most students today. To draw students in requires an inordinate level of devotion and most teachers are not able to commit to [this]" (Alger, 2009, p. 749). Şeker (2011b) reported that, as this study has found in Abu Dhabi, teachers in Turkey had difficulty in getting students to participate in lessons that were so different from traditional expectations. Participation by students requires their willingness and understanding of what participation means, looks and sounds like, as well as having the required knowledge and appropriate behaviour.

Student readiness is discussed in this section as an external factor; however, going hand-in-hand with this is classroom management and behavioural management skills. This is an "important aspect of teaching and a particularly difficult part of new teachers' experiences" (Dunn & Rakes, 2011, p. 51). "Teachers would spend a great deal of physical and mental energy in ensuring that classroom disorders and learner ill-discipline does not add to this threat of intensification, creating more answer-oriented, structured and control heavy pedagogy" (Stoffels, 2005, p. 536). Orafi and Borg (2009) report that teachers often do not use pair work because of the worry about losing control of the large class, "especially in a culture which has high regard for student discipline" (Orafi and Borg, 2009 p. 251). Teachers in rural China were reported to be reluctant to adapt new student-centred methods for reasons of self-protection (Wang, 2011).

The students of Abu Dhabi need time to adjust to the new roles expected of them in the classroom – their participation in the lessons, the understanding of their responsibility for their learning, becoming more self-directed and able to follow instructions, and beginning to think for themselves. Failure to recognise the changing role of the students and the time needed for these behaviours to be adopted will cause students to be frustrated with their teachers and see teachers reverting to traditional behaviours. City, Elmore, Fiarman, and Teitel (2009) make a strong point of this:

If you invest in higher-level content *and* teacher knowledge and skill, but you neglect the role of the student in the instructional process, you get students (and parents) who don't understand the new roles and demands that they are expected to meet (City et al., 2009, p. 26).

“I wish the students came with less baggage and more parental support” (Alger, 2009, p. 749). This lament from a teacher may be a common one. In Abu Dhabi parents tend to be very demanding of teachers, more so of the expatriate Arab teachers. Parents' understanding of the new curriculum, at the time of this research, was very limited. Parents pressured teachers into doing what parents expected and what used to be practised. This was also found to be the case in Japan, where Hooghart (2006) reported “parents may resist teacher efforts to change the curriculum as prescribed in the reforms and may even pressure teachers to conform closely to the previous curriculum” (Hooghart, 2006, p. 299). The status of the Arab expatriate teacher is not high for Emirate parents. Teachers are therefore often put in an untenable position of trying to appease the parents and, at the same time, come to terms with the new curriculum. The communities need to be informed about the changes being implemented, the new approaches in the classroom and the demands upon students if they are to support both students and teachers (*Recommendation 13*).

Further, students influence teachers' practices. Hooghart commented on the education reform in Japan, and emphasised that “students may not control a teacher's employment, salary, promotion or professional development but they can certainly influence his/her reputation and daily work environment” (Hooghart, 2006, p. 298). The Abu Dhabi teachers too, are worried that negative comments by students to their parents or the school administration may have severe implications for them.

6.2.6.5 *The Role of Coaches and Mentors as Advisers to Teachers*

The role of education advisers as coaches and mentors in the classroom emerged as a factor influencing teachers' implementation of the new curriculum. Those teachers who had been assigned an education adviser referred positively to the assistance and guidance from these people, indicating that the coaches helped them to produce more resources. My findings about the importance of coaching and mentoring during a time of change corroborated those of Deakin University (2006), Hoekstra and Korthagen (2011) and Hoekstra et al. (2009). The Deakin study examined education reform in Papua New Guinea, where teachers received up to four years of coaching and mentoring. Initially, teachers needed much guidance through point-by-point lesson plans and the assistance of a mentor, because most often the teachers did not understand the rationale for activities in the lesson, but were able to follow the detailed lesson plan provided. Without this guidance, teachers were found to default back to the known and comfortable previous styles. Support lays the groundwork for providing teachers with pertinent knowledge and skills related to the reform initiatives.

When reform initiatives are a radical departure from the teachers' known and understood conceptions and practice, professional learning is more successful if teachers are supported in the new learning and expected practice; coaches can tailor the support required to the needs of the individual teacher. This finding corroborates those of Hoekstra and Korthagen (2011) and Hoekstra et al. (2009), who found little correlation between the observed changes and professional learning, and that changes in teachers' conceptions were related to experimenting with new methods and reflection on practice.

Despite the positive remarks made by teachers about their coaches in this study, it should be noted that in many cases, teachers continued to use more traditional approaches. Therefore, thought needs to be given to assisting these coaches and mentors so that they are better able to guide and mentor teachers in ways likely to bring about philosophical and conceptual changes. Therefore, it is recommended that professional development be provided to improve the educational advisers' modus operandi and skill base (*Recommendation 14*). Teachers have to learn and develop a

“new view on teaching and learning; understand the concepts and principals on which the innovation is based and develop skills to translate the new way of teaching into practice” (Vermunt & Endedijk, 2011, p. 295). This takes not only time but strong support, because for teachers

[to] abandon a current working theory, or belief system, requires more than being exposed to a better theory. Conceptual changes ... emerge as a result of peoples' action-in-the-world, or experience, in conjunction with a host of hidden processes at play to equilibrate, or viably compensate, for surface perturbations. (Ackerman, 2004, p. 2)

In the words of a senior consultant overseeing aspects of the Abu Dhabi reform:

There is a need to concentrate efforts on the teachers who drive this vehicle of reform. Teachers need gas and greasing. The authorities have designed the colour and shape of the seats, interior and exterior, but it is the drivers who influence and control the cargo (students). Teachers' knowledge and understanding will make or break the reform. (Rheault, 2010, personal communication)

Given the findings reported in previous paragraphs, it is possible that education advisers could be an inhibiting factor, because without an identification of teachers' misconceptions, and the subsequent immediate correction of these misconceptions, teachers would continue with their beliefs and their new practice would not be sustainable. Therefore, it is recommended that the quality of coaching and mentoring abilities of advisers be reviewed (*Recommendation 15*).

Coaches may need to reconsider how they are working with teachers so that the misconceptions and lack of understanding are addressed. Without a focus on these misconceptions, even though lesson plans and demonstration lessons are provided, teachers will likely fall back on their default patterns and beliefs when advisers are withdrawn. It is recommended, therefore, that the coaches and mentors familiarise themselves with the beliefs of the teachers, their conceptions of the terminology and pedagogy required, in order for the advisers to assist teachers in changing these

faulty mental constructs (*Recommendation 16*). Further, it is recommended that coaches be familiar with transformative professional development methods (*Recommendation 17*).

This study sought to examine factors that may have influenced teacher change as demanded by the reform taking place in Abu Dhabi. Two distinct categories of factors affecting teachers' implementation of the curriculum reform emerged during data analysis: those factors that are within the teachers' control and those that are external to the teacher. These results are similar to the findings of Savasci and Berlin (2012) who also found that the teachers' background, epistemological and content knowledge, education and prior experiences impacted upon their beliefs and classroom practice. Together with external factors (such as students' ability, testing, resources, parental involvement, time and standards) these internal factors influence the teacher's classroom practice.

The factors affecting the teachers in Abu Dhabi provide an intricate set of interwoven challenges. An overarching factor is the lack of teacher knowledge and understanding and their misconceptions of the terminology, pedagogy and practices associated with constructivism as they have construed and believe it to be. For an education reform to succeed it is important that the teachers responsible for implementing the changes have the necessary knowledge, understanding and skills to implement such change, especially when there is a required change in pedagogy.

6.3 Limitations of the Research

As with all studies, this study had limitations. This section provides an overview of these.

Given the time constraints of the present study, the teacher sample for the present study was limited to 198 teachers (for the large-scale phase) and 182 Arab teachers (for the analysis of Arab teachers' beliefs) in nine schools. Although every attempt was made to ensure that the sample was representative of teachers and schools in the emirate of Abu Dhabi, this may not be the case for a number of reasons. First, because the teachers were all teachers of English (so that the interviews could be

conducted in English), it is possible that teachers of other subjects held different views and conceptions. Second, although every attempt was made to ensure that the school sample was representative of schools in Abu Dhabi, only schools from within the city of Abu Dhabi were included and therefore, the sample may not be a true representation of schools in other regions in the Emirate. Third, the collection of data was restricted to Cycle 2 and Cycle 3 schools, and may not be a reflection of other education levels in the Emirate. Given these limitations, generalisation of the results to other levels of education and the teachers of other subjects should be done with caution. Therefore, it is recommended that future studies include a wider sample of teachers and schools (*Recommendation 18*).

The qualitative component of the study involved 15 case study teachers. Although a cross-section of teachers was included, the selection of these teachers included only teachers of English. Although every effort was made to ensure that these teachers were representative the findings should be generalised to other teachers with caution. It is recommended that future studies involve a larger number of teachers and involve a longitudinal design to enable the examination of teachers' beliefs and whether they change during the implementation of education reform (*Recommendation 19*).

Important observation data was collected from the classes of each of the 15 case study teachers. Due to the time restrictions inherent in a PhD study, the observations were only carried out once in each of the case study teachers' classes. It is acknowledged that additional observations may have revealed additional data and, therefore, it is recommended that future studies involve more observations (*Recommendation 20*).

6.5 Summary of Recommendations

Recommendation 1 It is recommended that teachers attend professional development courses prior to and during the implementation of the reform to gain a better understanding of the reform initiatives.

- Recommendation 2 It is recommended that in the future, ADEC consider hiring only teachers who have a recognised professional qualification with a working understanding of constructivist classroom practice.
- Recommendation 3 It is recommended that teachers' pedagogical beliefs and knowledge be ascertained and professional development designed to ensure common understanding and practice as required by the reform initiative.
- Recommendation 4 It is recommended that all the Abu Dhabi teachers undergo further intensive professional development to up-skill and educate them with respect to the constructivist philosophy of education and associated pedagogy.
- Recommendation 5 The type of professional development used to up-skill the teachers needs to be carefully considered. The professional development providers should have an understanding of current adult learning theory and contemporary models of professional development. Furthermore, the professional development must take into consideration the teachers' deeply held beliefs about teaching.
- Recommendation 6 It is recommended that professional development providers, including coaches and mentors (education advisers) have knowledge of teachers' conceptual understandings of terminology and practice. In the case of coaches and mentors, it is recommended that they be cognisant of these and that they consider meaningful ways to address them on an individual basis.
- Recommendation 7 It is recommended that reform agents ascertain what teachers and school administrators know and how they

understand and interpret the reform requirements, paying particular attention to their conceptual interpretations.

Recommendation 8 It is recommended that professional development providers consider meaningful ways to address the misconceptions that teachers hold.

Recommendation 9 It is recommended that teachers be assisted in the translation of the curriculum into practice by providing them with intensive scaffolding and lesson plans to demonstrate what the constructivist lesson should look like and give details of the desired student activities. This should include both intensive scaffolding and assistance in the translation of the curriculum into practice.

Recommendation 10 It must be appreciated that learning takes time and to assume that the teachers will be capable of speedily learning and implementing a constructivist approach is unrealistic. It is recommended, therefore, that teachers not be overloaded with administrative and other duties but afforded time to learn, to reflect upon and to understand the requirements and philosophies of the new curriculum.

Recommendation 11 It is recommended that teachers be provided with prescriptive scaffolding detailing what students should be doing and what the teacher's role is during a lesson.

Recommendation 12 It is recommended that school leadership teams be provided with professional development and training so that they are better able to support the teachers. Teachers need to feel safe in their professional environment, particularly during a time of experimentation and learning which accompanies the implementation of reform, thus the school leadership

teams need also to understand the new curriculum in order to both support the teachers and reassure them that they are not going to be harshly judged by results and the old traditional criteria.

Recommendation 13 It is recommended that the communities be better informed about the changes, new approaches in the classroom and the demands upon students in order for them to support both students and the teachers. In order for parents to be able to support their children, communities need to be informed about the changes being implemented. Most times parents will have experience from their own traditional education and thus, without knowledge of what is being implemented, could be counter-productive, resistant and obstructive in the reform efforts.

Recommendation 14 It is recommended that the coaches and mentors be given training especially in terms of a coach's role, and a suitable skill base to assist, guide and mentor teachers to address conceptual misunderstanding and bring about philosophical change.

Recommendation 15 It is recommended that the quality of the advisers' coaching and mentoring abilities and how they work with teachers be reviewed.

Recommendation 16 It is recommended that the coaches and mentors familiarise themselves with the beliefs of the teachers and their conceptions of the terminology and pedagogy required, in order to assist teachers in changing faulty mental constructs.

Recommendation 17 It is recommended that coaches be familiar with professional development methods that are transformative.

- Recommendation 18 It is recommended that future studies include a wider sample of teachers and schools to increase the generalisability of the findings.
- Recommendation 19 It is recommended that future studies involve a larger number of teachers and involve a longitudinal design to enable the examination of teachers' beliefs and whether they change during the implementation of education reform.
- Recommendation 20 Given that additional observations may have revealed additional data, it is recommended that future studies involve more observations.

6.6 Significance

The results of this study are likely to be of significance for a number of reasons. First, this was the first study to be carried out in Abu Dhabi to examine teachers' beliefs during the curriculum reform that was taking place, and how these and other factors influence the teachers' implementation of the reform expectations.

The development of the new survey, the Teacher Belief Survey, has methodological significance. The TBS captures information related to teachers' beliefs about teaching and, as such, could be used within educational institutions in order to determine what professional development to deliver and to whom, based on their beliefs. Further, consideration could be given to using the TBS as a tool for recruitment to assist in the selection of candidates whose beliefs match those of the education body for whom they would be working.

The findings, especially with respect to the internal and external factors affecting teachers in their implementation of education reform policies, could serve as guidelines and pointers for countries, regions, schools and authorities considering introducing education reform initiatives. The findings are significant to:

- The continuing reform in Abu Dhabi. A failure to take cognisance of the internal and external factors influencing teachers, and to work on correcting these, will result in superficial change, and once the advisers are withdrawn it is likely that teachers will default into their known, comfortable and traditional ways of teaching. Teachers need continued support in the change efforts in meaningful ways that may be provided by the school leadership team and the advisers.
- Professional development providers. This study highlights the role that teachers' beliefs, understanding and incongruent conceptual interpretations play in their implementation of curriculum reform. To provide meaningful and sustainable professional development, providers must identify these beliefs, understandings and interpretations in order to assist teachers in their understanding and correction of misinterpretations and existing conceptual interpretations, as well as to equip them with the necessary new skills required, such as behaviour management and lesson planning.
- Government policy makers. Policy makers are advised to take note of the challenges facing teachers and to ensure that policy is enforced to assist the teachers and communities in understanding and coming to terms with a new curriculum. Teachers' workloads need to be considered in light of the learning that they will need to do. Teachers need support in their attempts to implement curriculum and change their pedagogical practice.
- Other countries/regions considering education reform, particularly on a large scale, are cautioned that before embarking upon curriculum reform a detailed plan of action must be created in order to identify teachers' and school leaders' understanding of the reform and their pedagogical and epistemological beliefs, and to provide intensive training prior to the implementation of the reform. Furthermore, continuous support, professional development and scaffolding need to be provided to teachers for a number of years, in order to create sustainable change.
- Teacher coaches and mentors. These need to be selected with care and provided with suitable training in how to coach and mentor teachers, how to work with the teachers. Before commencing work with teachers, coaches should have a thorough knowledge of the beliefs, understandings,

background and possible conceptual misinterpretations that teachers will make, so that these may be addressed early in the reform. If each party assumes they have a common understanding, the misinterpretations become entrenched and may cause conflict between the parties.

6.7 Concluding remarks

The factors affecting the implementation of the reform efforts by Arab teachers in Abu Dhabi provide an intricate set of interwoven challenges. My findings suggest that an overarching factor affecting the implementation of the reform requirements is a lack of teacher knowledge related to the new curriculum and misconceptions of the terminology related to constructivism. For an education reform to succeed it is important that the teachers, who are ultimately responsible for implementing the changes, have the necessary knowledge, understanding and skills to implement such change. It would appear that there is an underlying assumption that teachers have the expected knowledge, skills and understanding to implement the required reform initiatives, or that traditional professional development methods, rather than transformative methods (used in Abu Dhabi at the time of data collection), are sufficient to support teachers in their efforts to make the changes required. My findings suggest that neither of these are the case. As such, the findings reported in this thesis offer much in terms of helping government officials, policy makers, curriculum developers, professional development providers and teachers to grapple more effectively with the changes that are needed to successfully implement the requirements of the reform.

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Appendix 1

Maps showing the location of Abu Dhabi

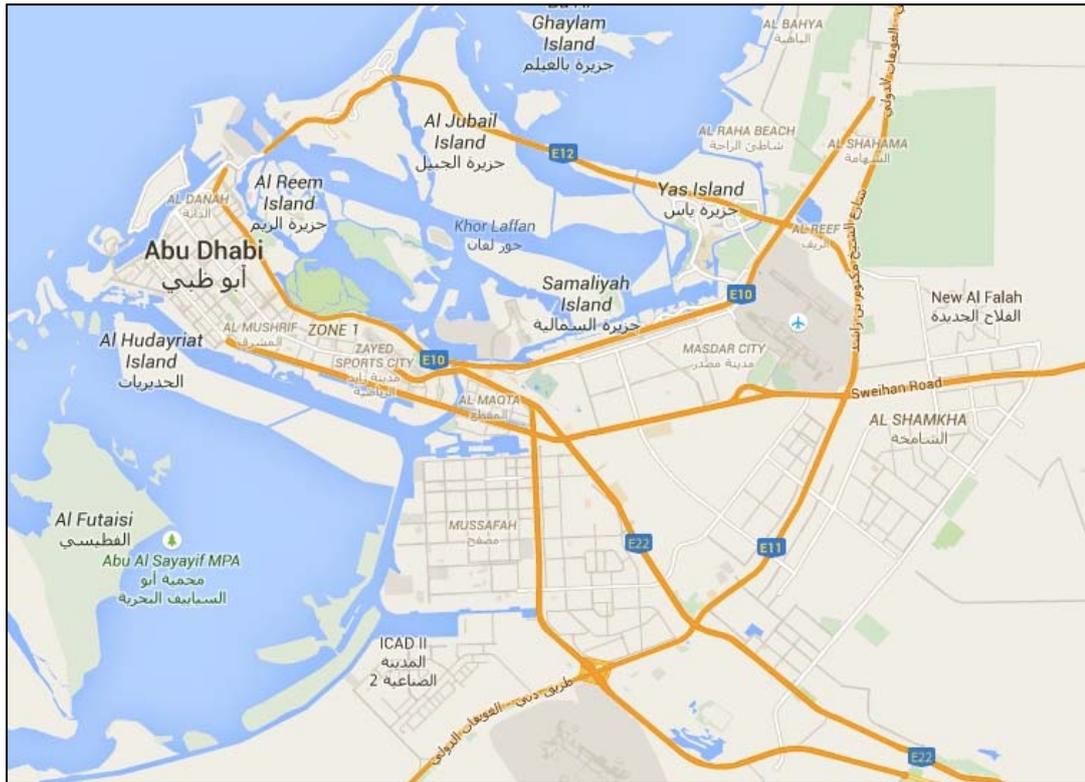


Map 1. Location of Abu Dhabi within United Arab Emirates⁹



Map 2. The extent of the emirate of Abu Dhabi

⁹ Source: Google Maps



Map 3. The extent of the city of Abu Dhabi today, also showing the island of Abu Dhabi (the original site of the city)

Appendix 2

Summary of Learning Environment Instruments

Summary of Learning Environment Instruments (after Fraser, 2012, pp. 1196-1197)

| Instrument | Developer & Date | Designed for Education Level | Items per scale | Scales classified according to Moos's Scheme | | |
|--|---|---|-----------------|--|--|---|
| | | | | Relationship dimensions | Personal development dimensions | System maintenance and change dimensions |
| LEI – Learning environment Inventory | Walberg, (1968) | Part of evaluation for Harvard Physics project Secondary | 7 | Cohesiveness Friction Favouritism Cliquesness Satisfaction Apathy | Speed Difficulty Competitiveness | Diversity Formality Material Environment Goal Direction Disorganisation Democracy |
| CES – Classroom Environment Scale | Moos (1979); Moos & Trickett (1987); Fisher & Fraser (1983) | Secondary (Middle and High school) | 10 | Involvement Affiliation Teacher Support | Task orientation Competition | Order and organisation Rule clarity Teacher control Innovation |
| CUCEI – College and University Classroom Inventory | Fraser & Treagust, (1986) | Higher Education (College, University) | 7 | Personalisation Involvement Cohesiveness Satisfaction | Task orientation | Innovation Individualisation |
| MCI – My Classroom Inventory | Fisher & Fraser (1981); Fraser & O'Brien (1985) | Elementary (primary school) | 10 | Friction Satisfaction | Competitiveness | |
| QTI Questionnaire on Teacher Interaction | Wubbels & Brekelmans (1998); Wubbels & Levy (1993) | Primary and Secondary | 8 -10 | Helpful/friendly Understanding Dissatisfied Admonishing | | Leadership Student responsibility Uncertain Strict |
| ICEQ – Individualised classroom questionnaire | Fraser (1990) | Secondary (Middle and High school) | 10 | Personalisation Participation | Independence Investigation | Differentiation |
| WIHIC – What is happening in this class? | Aldridge, Fraser & Huang (1999) | Secondary | 8 | Student cohesiveness Teacher support Involvement | Investigation Task orientation Cooperation | Equity |

| Instrument | Developer & Date | Designed for Education Level | Items per scale | Scales classified according to Moos's Scheme | | |
|--|--|---|-----------------|--|----------------------------------|---|
| | | | | Relationship dimensions | Personal development dimensions | System maintenance and change dimensions |
| CLES – Constructivist learning Environment Inventory | Taylor, Dawson & Fraser (1995); Taylor, Fraser & Fisher (1997) | Secondary | 7 | Personal relevance Uncertainty | Critical voice Shared control | Student negotiation |
| SLEI – Science Laboratory Environment Inventory | Fraser & McRobbie (1995) | Upper secondary and Higher (High school and College/university) | 7 | Student cohesiveness | Open-endedness Integration | Rule clarity Material environment |
| COLES – Constructivist Oriented Learning Environment Survey | Aldridge, Fraser, Bell & Dorman (2012) | Secondary and High | 8 | Student cohesiveness Teacher support Personal relevance Involvement | Task Orientation Cooperation | Differentiation Equity Young Adult Ethos <u>Assessment:</u> Clarity of assessment Formative Assessment |
| TROFLEI – Technology-Rich Outcomes Focused Learning Environment Instrument | Aldridge (2012) | Secondary | 8 | Student Cohesiveness Teacher Support Involvement Investigation | Task Orientation Cooperation | Differentiation Equity Young Adult Ethos Computer Usage |

Appendix 3

Letter and Feedback Sheet for Participants of Pilot Study

Pilot Study for Survey Instrument

My name is Monika von Oppell. I am an Education Adviser for ADEC doing research for ADEC and higher degree purposes.

Thank you for assisting me in this pilot study of this survey instrument (questionnaire). The goal of the questionnaire is to effectively determine the core beliefs of a teacher with respect to his/her classroom and associated practice. The goal of this pilot study is for me to hear from you what is working and what is not; therefore:

1. Please complete all aspects of the survey;
2. On the last page please respond to the questions asked in order for me to be more accurate and realistic in the survey. If you are happy for me to talk with you about the survey please write down your name and telephone number. Your responses can be in English or Arabic.
3. This study will not be used for data collection purposes. It is purely a pilot study for improvement of the questionnaire;
4. Your details will remain in the strictest of confidence at all times.

Many thanks for your time and responses.

Monika von Oppell

Please respond to the following questions with response to your completion of the questionnaire:

1. The layout of the questionnaire: any comments/suggestions?

2. Any translation issues?

3. Any questions/instructions you did not understand or were unclear?

4. Anything else?

Thank you for your time and your responses.

Appendix 4

Arabic and English Wording for Items in the Teacher Belief Survey

استبيان لرأي المعلم

Teacher Belief Survey

A

Role of the Teacher دور المعلم

3. As the teacher it is my role to ensure that students work silently.
كوني معلّم فدوري يقتضي ضمان عمل جميع الطلاب بصمت.
4. As the teacher it is my role to deliver factual information to students.
كوني معلّم فدوري يقتضي توصيل معلومات حقيقية للطلاب.
5. As the teacher it is my role to ensure that students have the correct answers in their workbooks.
كوني معلّم فدوري يقتضي ضمان إجابات صحيحة في دفاتر الطلاب.
6. As the teacher it is my role to determine the topics for teaching and learning.
كوني معلّم فدوري هو تحديد مواضيع التدريس و التعلّم.
7. As the teacher it is my role to ensure that all students learn what I know.
كوني معلّم فدوري هو ضمان أن جميع الطلاب يتعلمون ما أعرفه.
8. As the teacher it is my role to follow a textbook.
كوني معلّم فدوري هو متابعة الكتاب المدرسي.
9. As the teacher it is my role to teach and then test that students have remembered the information.
كوني معلّم فدوري يقتضي تدريس المعلومة ثم اختبار الطلاب فيها لتذكرها.
10. As the teacher I establish classroom behaviour rules.
كوني معلّم فقد أسست قواعد سلوكية للصف الدراسي.
11. As the teacher I control discussion in the classroom.
كوني معلّم فأنا أتحكم في إدارة النقاشات الصفية.
12. As the teacher it is my role to plan the units of work.
كوني معلّم فدوري هو التخطيط لوحداث العمل.
13. As the teacher it is my role to create resources for teaching and learning.
كوني معلّم فدوري هو إيجاد و توفير مصادر للتعليم و للتعلّم.

Teacher's philosophy of learning and knowledge acquisition in the classroom

B

فلسفة المعلم في التعلّم و في المعرفة المكتسبة في الصف الدراسي.

14. Students learn best when the teacher explains the facts.
عند شرح المعلم للحقائق يكون تعلّم الطلاب أفضل.
15. Students learn best when the teacher gives them views and opinions.
عند عرض المعلم للأراء يكون تعلّم الطلاب أفضل.
16. Students learn best when they reflect on how they manage tasks.
عندما يعكس الطلاب كيفية تحكمهم في المهمة المعطاة لهم فيكون تعلمهم أفضل.
17. Students learn best by building on previous knowledge.
عندما يبني الطالب على معرفتهم السابقة فيكون تعلمهم أفضل.
18. Students learn best when they all complete the same worksheet.
عندما يقوم جميع الطلاب بإنجاز نفس ورقة العمل فيكون تعلمهم أفضل.
19. Students learn best when they do problem-based learning.
عندما يقوم الطلاب بالتعلّم الذي يركز على حل المشاكل فيكون تعلمهم أفضل.
20. Students learn best when they copy notes from the board.
يكون تعلم الطالب بصورة أفضل عندما يقوموا بنقل الملاحظات من السبورة.
21. Students learn best when they are given notes to learn from.
يكون تعلم الطالب بصورة أفضل عندما يُعطون ملاحظات للتعلّم منها.
22. Students learn best when they follow the textbook.
عندما يتبع الطلاب كتاب مدرسي يكون تعلمهم أفضل.
23. Students learn best when they make connections through the learning material and their knowledge.
يكون تعلّم الطالب أفضل عندما يقوموا بالربط بين مصادر التعلّم و معرفتهم.

24. Students learn best when they listen to me correct the work of others.
عندما يستمع الطلاب لي و أنا أصحح أعمال الآخرين يكون تعلمهم أفضل.

Pedagogy – Choice of Delivery

C البيداغوجيا (علم أصول التدريس) - خيار للتقديم

25. My lessons involve complex tasks.
تشتمل حصصي على مهام معقدة.
26. My lessons challenge students to make connections.
تضع حصصي الطلاب أمام تحديات كي يقوموا بعملية الربط.
27. My lessons focus on the acquisition of facts.
تُركز حصصي على اكتساب الحقائق.
28. My lessons involve students questioning the information.
حصصي تُشرك الطلاب في استجواب المعلومة.
29. My lessons involve explaining all the information needed before students begin the task.
حصصي تشتمل على شرح جميع المعلومات الضرورية للطلاب قبل البدء في مهمتهم.
30. My lessons involve students working on different activities at the same time.
حصصي تُشرك الطلاب في العمل في جميع الأنشطة في الوقت نفسه.
31. My lessons involve students repeating exercises until they succeed.
حصصي تجعل الطلاب يعيدوا التدريبات أكثر من مرة حتى ينجحوا فيها.
32. My lessons involve students completing worksheets.
تعطي حصصي الطلاب مجال لاتمام أوراق العمل.
33. My lessons involve activities that cater for students with different abilities.
تشتمل حصصي على أنشطة تزود الطلاب بمختلف القدرات.
34. In my lessons, all that the students need to know can be found in the textbook.
ما هو موجود في حصصي وجميع الطلاب يحتاجونه يستطيعوا أن يجده في الكتاب المدرسي.
35. In my lessons I encourage students to reflect on tasks.
في حصصي أشجع الطلاب على اظهار انطباعهم في المهمة المعطاة.
36. In my lessons I encourage students to reflect on their ideas.
في حصصي أشجع الطلاب على إظهار انطباعهم على آرائهم و أفكارهم.

37. In my lessons I provide opportunities for students to reflect on the strategies that they use.
في حصصي أُتيح الفرصة للطلاب لاعطاء انطباعهم على استراتيجياتهم المستخدمة في المهمات المعطاة.

D التعاون Collaboration

38. In my lessons students work collaboratively on tasks.
في حصصي يتعاون طلابي مع بعضهم البعض في انجاز المهمات المعطاة.
39. In my lessons collaborative activities are used to develop analysis skills.
تُستخدم الأنشطة التعاونية في حصصي لتطوير مهارات التحليل.
40. In my lessons collaborative activities are used to synthesise information.
تُستخدم الأنشطة التعاونية في حصصي لتركيب و تجميع المعلومات.
41. In my lessons there is dialogue between students.
في حصصي تجد المحادثات بين الطلاب.
42. In my lessons students collaborate to decide how a task should be approached.
يتعاون الطلاب في حصصي لتقرير كيفية اتمام المهمات المعطاة.
43. In my lessons students collaborate in role allocation.
يتعاون الطلاب في حصصي وفقاً لتوزيع الأدوار فيما بينهم.
44. In my lessons stronger students are paired with weaker students to guide them.
في حصصي يزدوج الطالب القوي لإرشاد الطالب الضعيف.
45. In my lessons I provide opportunities for students to compare how they approach tasks with others.
في حصصي أُعطي الفرص لطلابي كي يقارنوا في كيفية انجاز المهمات مع الآخرين.
46. In my lessons, students are encouraged to share their ideas.
أشجع الطلاب في حصصي على إبداء و مشاركة آرائهم و أفكارهم.
47. In my lessons, students are encouraged to work together.
أشجع الطلاب في حصصي على العمل سويةً.

E **Physical Environment** البيئة الملموسة

48. In my classroom I display a range of student work.
أعرض في صفي الدراسي عدد من أعمال الطلاب.
49. In my classroom all of the students have the opportunity to display their work.
جميع الطلاب لديهم الفرصة لعرض أعمالهم في صفي الدراسي.
50. In my classroom the displays are interactive.
المعروضات تفاعلية في صفي الدراسي.
51. In my classroom the displays are changed regularly.
تتغير المعروضات في صفي الدراسي باستمرار.
52. In my classroom only excellent examples of student work are displayed.
يتم عرض أعمال الطلاب المتميزين فقط في صفي الدراسي.
53. In my classroom student work is corrected before it is displayed.
يتم تصحيح أخطاء الطلاب قبل عرضها في صفي الدراسي.
54. In my classroom students desks are arranged in rows.
في صفي الدراسي طاولات الطلاب و مقاعدهم مرتبة في صفوف.
55. In my classroom students are invited to create the display of work.
أدعو الطلاب لبيدعوا في عرض أعمالهم في الصف الدراسي.
56. In my classroom I encourage students to suggest seating arrangements.
أشجع الطلاب في صفي الدراسي على ابداء اقتراحاتهم بشأن المقاعد.

F **Assessment** التقييم

57. I use quizzes and tests to establish students' achievement levels.
أستخدم الاختبارات و الامتحانات لإيجاد مستوى إنجاز الطلاب.
58. I use assessment data to find out which students have worked hard.
أستخدم نتائج التقييم للتعرف على الطلاب المجتهدين.
59. I assess students while they are working.
أقيم الطلاب أثناء عملهم.
60. I use Continuous Assessment to inform me of where to start the next lesson.
أستخدم التقييم المستمر لكي أعرف أين أبدأ في الدرس القادم.
61. I use assessment results to plan the next semester's work.
أستخدم نتائج التقييم في وضع خطة الفصل الدراسي الذي يليه.

62. I use past exam papers to help students memorise facts.
أستخدم أوراق الاختبارات السابقة لمساعدة الطلاب على حفظ الحقائق.
63. Students demonstrate their understanding through correctly completing worksheets.
يعرض الطلاب فهمهم من خلال انجازهم لأوراق العمل بشكل صحيح.
64. Students demonstrate their learning when they provide feedback to their peers.
يعرض الطلاب تعلمهم عندما يظهروا انطباعهم و آرائهم لأقرانهم.
65. Students use peer evaluation.
يستخدم الطلاب تقييم القرين.

Appendix 5
Arabic and English Wording for Items in the Constructivist Oriented Learning
Environment Survey
(COLES)

Constructivist Oriented Learning Environment Survey

Shared Control القيادة المشتركة

1. I help the teacher to plan what I am going to learn.
أساعد المعلم في التخطيط لما سأتعلمه
2. I help the teacher to decide how well I am learning.
أساعد المعلم في تقييم جودة تعلمي
3. I help the teacher to decide what activities are best for me.
أساعد المعلم في اختيار أي الأنشطة هي النسب لي
4. I help the teacher to decide how much time I spend on learning activities.
أساعد المعلم في تقدير الوقت الذي قضيته في تأدية الأنشطة
5. I help the teacher to decide which activities I do.
أساعد المعلم في تحديد الأنشطة التي أقوم بها
6. I help the teacher to assess my learning.
أساعد المعلم في تقييم درجة تعلمي

Teacher Support دعم المعلم للطالب

7. The teacher considers my feelings
المعلم يراعي لمشاعري
8. The teacher helps me when I have trouble with the work.
المعلم يساعدني عندما يكون لدي مشكلة مع المهمة
9. The teacher talks with me.
المعلم يتحدث معي
10. The teacher takes an interest in my progress.
المعلم يهتم بالتقدم الذي أحرزته
11. The teacher moves about the class to talk with me.
المعلم يتحرك عبر الطلاب للحديث معي
12. The teacher's questions help me to understand.
أسئلة المعلم تساعدني على الفهم

Equity المساواة

13. The teacher gives as much attention to my questions as to other students' questions. المعلم يعطي الكثير من الاهتمام لأسئلتي و أسئلة الطلاب الآخرين.
14. I get the same amount of help from the teacher as do other students. أحصل على نفس القدر من المساعدة من المعلم كما يفعل مع غيري من الطلاب
15. I have the same amount of say in this class as other students. لدي نفس القدر من القول في هذا الصف مثل غيري من الطلاب
16. I receive the same encouragement from the teacher as other students do. أتلقى التشجيع من المعلم نفسه كما يفعل مع الطلاب الآخرين
17. I get the same opportunity to contribute to class discussions as other students. احصل على نفس الفرصة للمساهمة في مناقشات الصف مثل الطلاب الآخرين
18. I get the same opportunity to answer questions as other students. احصل على نفس الفرصة للرد على أسئلة مثل الطلاب الآخرين

Young Adult Ethos روح النشء الراشد

19. I am treated like a young adult. أنا أعامل مثل الراشدين الشباب
20. I am given responsibility. نا أعطيت مسؤولية
21. I am expected to think for myself. يتوقع مني التفكير بنفسي .
22. I am regarded as reliable. أنا أعتبر يمكن الاعتماد علي
23. I am considered mature. أنا اعتبر ناضج
24. I am given the opportunity to be independent. أنا أعطيت الفرصة لاكون مستقلا
25. I am encouraged to take control of my learning. تم تشجيعي على التحكم بتعليمي.

Formative Assessment

التقييم المرحلي

26. I use feedback from assessment tasks to improve my learning.
استخدام تعليقات من الوظائف أو اختبارات التقييم لتحسين تعلمي
27. Assessment tasks help me to understand the topic.
مهام التقييم تساعدني على فهم الموضوع
28. I can see a link between classroom activities and the assessment tasks I do.
أستطيع أن أرى وجود علاقة بين النشاطات الصفية ومهام التقييم التي أقوم بها
29. Assessment tasks help me to identify weaknesses in my understanding.
مهام التقييم تساعدني على تحديد نقاط الضعف في فهمي
30. Assessment tasks help me to monitor my own learning.
مهام التقييم تساعدني على رصد التعليم الخاص بي
31. Assessment tasks are an important part of my learning.
مهام التقييم هي جزء هام من التعليم الخاص بي

Clarity of Assessment Criteria

وضوح معايير التقييم

32. I am aware of which activities and tasks are used to assess my performance.
أنا على علم بالأنشطة والمهام التي تستخدم لتقييم أدائي
33. I know what types of information are needed to complete an assessment task.
أنا أعرف ما هي أنواع المعلومات اللازمة لإتمام مهمة التقييم
34. The instructions for assessment tasks are clear to me.
تعليمات للقيام بمهام التقييم واضحة بالنسبة لي
35. I know how to complete assessment tasks successfully.
أنا أعرف كيف أستكمل مهام التقييم بنجاح
36. I understand how the teacher judges my work.
أنا أفهم كيف يمكن للمعلم تقييم عملي
37. I know how to complete different assessment tasks.
أنا أعرف كيف أكمل الوظائف أو اختبارات التقييم المختلفة

Involvement المشاركة

38. I discuss ideas in class. أناناقش الأفكار في الصف.
39. I give my opinions during class discussions. أعطي رأيي أثناء مناقشات الصف.
40. The teacher asks me questions. المعلم يسألني أسئلة.
41. My ideas and suggestions are used during classroom discussions. تستخدم أفكارني واقتراحاتي أثناء المناقشات الصفية.
42. I explain my ideas to other students. أشرح أفكارني إلى الطلاب الآخرين.
43. I am asked to explain how I solve problems. طلب مني ان اشرح كيف يمكنني حل المشاكل.

Task Focus (التوجيه في المهمة **Task Orientation**) التركيز في المهمة

44. Getting a certain amount of work done is important to me. الحصول على قدر معين من العمل المنجز مهم بالنسبة لي.
45. I am ready to start this class on time. أنا مستعد لبدء هذا الصف في الوقت المحدد.
46. I set my own goals for this class. حددت أهدافي الخاصة لهذا الصف.
47. I pay attention during this class. أنا انتبه أثناء هذا الصف.
48. I try to understand the work in this class. أحاول أن أفهم طبيعة العمل في هذا الصف.
49. I know how much work I have to do. أنا اعرف كمية العمل الذي يجب أن أقوم به.

Personal Relevance روابط شخصية

50. I relate what I learn in this class to my life outside of school. أنا يمكنني ان اربط ما تعلمته في هذا الدرس بحياتي خارج المدرسة.
51. What I learn in this class is relevant to my day to day life. ما أتعلمه في هذا الصف متعلق بحياتي اليومية
52. I apply my everyday experiences in this class. يمكنني تطبيق تجاربي اليومية في الصف
53. This class is relevant to my life outside of school. هذا الصف ذو صلة بحياتي خارج المدرسة
54. In this class, I get an understanding of life outside of school. في هذا الصف يمكنني فهم الحياة خارج المدرسة
55. I apply what I already know to the work in this class. أنا اطبق ما أعرفه مسبقا للعمل في هذا الصف

Cooperation التعاون

56. We work in groups (or pairs) in this class. نحن نعمل في مجموعات (أو زوج) في هذا الصف.
57. When I work in groups in this class, there is teamwork. عندما أعمل في مجموعات في هذا الصف يكون العمل الجماعي
58. I work with other students on assignments in this class. أنا أعمل مع طلاب آخرين في المهام في هذا الصف
59. I cooperate with other students on class activities. أنا اتعاون مع طلاب آخرين في النشاطات الصفية
60. I share my books and resources with other students when doing class work. يمكنني مشاركة كتيبي والمصادر مع الطلاب الآخرين عندما نقوم بالاعمال الصفية
61. Working with other students helps me to learn. العمل مع الطلاب الآخرين يساعدني على التعلم

الفروق الفردية (Differentiation) Individualisation

62. أنا قادر على العمل بسرعة. I am able to work at the speed which suits my ability. التي تناسب قدراتي.
63. الطلاب الذين يعملون اسرع من الاخرين قادرين على الانتقال إلى الموضوع التالي. Students who work faster than others are able to move on to the next topic.
64. I can choose topics I wish to study. يمكنني اختيار الموضوعات التي أود أن ادراسها.
65. Tasks are suited to my interests. تناسب المهام اهتماماتي.
66. Tasks are suited to my ability. تناسب المهام قدراتي.
67. أنا I am able to do work that is different from other students in this class. قادرة على القيام بعمل مختلف عن الطلاب الآخرين في هذا الصف.

Thank you for your assistance in completing this questionnaire.

شكراً لمساعدتكم في إنجاز هذا
لاستبيان.

Appendix 6

Questions used to Guide the Interviews With Teachers

Interview Guide:

1. What comes to mind when you think about *learning*?
2. How do you know when you have learnt something?
3. What comes to mind when you think about *teaching*?
4. How did you decide on the instructional goals and objectives for this lesson?
5. What are the outcomes you wish to achieve for this lesson?
6. How do you make use of students' interests and prior knowledge? How do you know this?
7. How did you choose the activities for the lesson? Explain why.
8. How did you select the resources for this lesson?
9. How will you know if students are learning what you intend them to learn in the lesson?
10. What do you plan to do if some students are not coping?
11. What classroom arrangement have you planned and why? Student groupings?
12. How do you see your role and responsibility as the teacher in the classroom?
13. What do you expect from your students during the lesson? What will this look like?
14. What is your understanding of "active" students? What does this look like in your classroom?
15. What is your understanding of "student centered"? What does this look like in your classroom?
16. What is your understanding of "cooperative learning"? What does this look like in your classroom?
17. How is group work different/same as cooperative learning?
18. What is your purpose for using group work?
19. How do you motivate your students?

Appendix 7

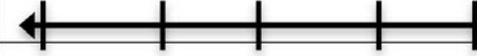
Lesson Observation Recording Sheet

Lesson Observation

Grade: _____ Boys/Girls

Teacher Nationality: _____ Age: _____ Yrs. Teaching Experience:

| Role of the Teacher | | |
|---------------------|---|---|
| 6. | Teacher instructing, delivering information.  | Teacher facilitating, supporting, guiding students – individual or groups. |
| 7. | Teacher maintains control of class/student discipline. | Students self-managing behaviour with the support of teacher. |
| 8. | Frequent praise of students – extrinsic motivation. Praise not necessarily warranted. | Intrinsic motivation. Worthy praise in context of task. |
| 9. | Students told what to do – low expectations of students. | SS know what is expected of them. Ss get on with the tasks without having to be told step by step what to do. |
| 10. | Students working silently. | Constructive buzz (good noise of collaboration and learning). |

| Philosophy of Learning and Pedagogy | | | |
|-------------------------------------|---|--|---|
| 7. | SS passive participants in the learning process. Their role is to receive and memorise. |  | SS active learners, constructing their own meanings. |
| 8. | Explicit teacher explanations prior to students doing work/task. |  | SS decide themselves what has to be done, thinking, discovery and decision making. |
| 9. | Work – mainly worksheets / workbooks for students to ‘fill-in’. |  | Combination of complex activities where students need to think individually and in groups. |
| 10. | Mainly Individual work. |  | Collaborative activities and group tasks. |
| 11. | Replication of T-talk, Textbook, and white board. |  | SS constructing own knowledge/questioning and forming own views/ideas; interaction of students. |
| 12. | T gives his/her meaning/interpretation of problems. Students expected to accept these. |  | SS allowed to create own meanings and justify/explain their understanding/ group decisions. |
| 13. | No aim/objective of lesson articulated/shared/ little structure. |  | SS know the purpose of the lesson/task. (Not to be confused with the students know what to do in a task). Outcomes clear and visible. |
| 14. | Teacher asks simple closed questions. (Yes/No or right/wrong). |  | Open-ended thoughtful questions which encourage discussion, thinking and debate. |
| 15. | Questions directed to selected students. |  | Questions aimed at all students. |
| 16. | Whole class teaching activity. |  | Teaching to small groups activity/ individuals. |

| Classroom Physical Environment | | | |
|---------------------------------------|--|--|--|
| 17. | Few materials on classroom walls. |  | Print Rich, stimulating environment. |
| 18. | No/Selected SS work on display only. |  | Wide selection of SS work displayed. |
| 19. | Materials on display not relevant to current topic/theme. |  | Vocab/topic/pictures all very relevant to topic/theme being explored during lesson. |
| 20. | Single rows of desks. |  | Ss sit in groups of ±4/5 SS. Groupings and size may change during lesson |
| 21. | Q & A T directed to select SS. T controls direction of lesson/questioning. One-way direction. |  | Group discussion. SS grappling with questions. T redirects assessing SS needs. Dialogue. |
| 22. |  All students completing same worksheets. |  | Different activities – variety of activities/resources dependent on SS progress/ability.  |
| Reflection | | | |
| 23. | No opportunity for individual/group reflection. Guided answering. |  | Opportunities are created for group/ individual reflection or learning. |
| 24. | No plenary/summation of lesson. |  | Plenary/SS and teacher summarise –reflection of learning of the lesson. |
| 25. | SS accept teachers' view/statements |  | SS question and reflect before accepting teacher or other's view/ statements. |

| Time | | | |
|-----------------|---|--|--|
| 26. | Activities stopped when students become restless and then teacher gives answers or calls for answers from these students. |  | All students have time to reflect and complete activities. All students may be called upon for their views. |
| 27. | Emphasis on having correct answers. Students may be shy to answer. |  | Emphasis on SS achieving a satisfactory outcome and knowing where they are going. |
| 28. | Learning material/topic unrelated to SS real world. |  | Relevance of learning materials to students. |
| Feedback | | | |
| 29. | Simple feedback – ‘excellent’, ‘well done’ irrespective if this is true or not (verbal/written), directed at some students. |  | Relevant, constructive, clearly guiding students and giving direction for improvement. Meaningful feedback. Peer assessment. |

Appendix 8

Example of Interview Analysis

Teacher Knowledge and Understanding

| Assessment | Learning | Lesson planning/objectives | Resources | Outcomes/Objectives | Curriculum | Feedback | Teachers role |
|--|--|--|--|---|---|--|--|
| understand how assess about is learning is an everyday interaction | acquisition of facts | No reference to Curricula to determine learning objectives | worksheets on the internet. "I try to understand their objectives just to implement them in my own classroom" (Sulbaran) - copies from old TBs, worksheets from grammar sites on internet. No concept of designing activities in order for ss to develop a skill/outcome. | Understanding of 'outcome' vague. Not sure of gradual release model but uses the words. | Not understood | strong as give weak as answers | SS here are all weak at english. Not perceived as teachers role to teach these students regardless of their levels |
| assess correct facts | completion of worksheets | no understanding of lesson objectives | No TBs gave freedom - but reliant on texts from textbooks and exercises, internet worksheets, colleagues worksheets. No reference to adapting to outcomes desired. | Vague understanding of Objectives | Not understood = learning plan | never, by asking them to give me the worksheet, continuous feedback - jakes, at the end of every part of the stage I usually make a feedback, let's say, lesson to make sure that they understand" (Sulbaran) (he gives them the | SS are different, therefore can't rely on them |
| noticed change in belief but not seen practice | use worksheets to ensure material is covered | unclear of lesson/learning objectives | From the internet; from other teachers; | Muddled and vague understanding. Using terminology but vague. No reference to curriculum. | Using Curriculum documents and content points to plan lessons | | Content - I should plan activities so 'weak' can learn. |
| not used to inform practice | Narrow definition but not comfortable and moved to new topic | stand alone lessons - unclear of continuous learning | Enjoys freedom from TBs but no reference of resources linking to curriculum or to develop outcomes. | Vague understanding of outcomes/objectives | Poor understanding of curriculum | | To make learning enjoyable so as are happy |
| not understood | facts | unclear of lesson objectives | Internet, downloads lessons, worksheets, games | Unclear on lesson objectives | English Learning Plan = curriculum | | T gives correct answers, as must listen to teacher |
| assessment criteria gives an idea of objectives for lessons | if students happy then it is good | unclear of lesson objectives | "I try provide me with some resources, specially resources from the lower grade levels, resource from grade 6 or grade 5 even, so I can give them to my slow learners" (Mohammad) Resources = worksheets (I trying out for help and asking for assistance with differentiation). | Vague objectives. | Confusion with content, do not understand concept of curriculum - uses jargon, but does not understand. | | "OK we are no longer the centre of the classroom, but we are here, we have our place." (Hajima) - |
| uses and right answers | concept of learning unclear | is finding materials and very time consuming | "A text book could be useful, just to take certain aspects of whatever it is in there. Like I mean, in Canada every grade has a textbook where you can just take, source materials. ... And its not a textbook that has comprehension questions. It's just an English book that has materials in it" (Matthew) | Muddled idea of objectives | Subject learning plan = curriculum. | | T= facilitator. "I am guide. My role as a teacher coming, my role in the classroom coming minimizing the lesson is centered now, the students are doing everything" (Nad) (Understanding of SS centered??) |
| not used for planning | concept of learning unclear | Clear Lesson objectives (has understanding) | "Everyone is complaining about that, they say this is not our job. It's not our job to find the text, and to find resources and do this and that. We only need the | Clear lesson objectives (has understanding) | T (BMT) never seen curric document! | | SS must comply with what he wants them to do, no discussion, no collaboration! |

Appendix 9

ADEC Research Permission



مجلس أبوظبي للتعليم
Abu Dhabi Education Council
Education First - منذ 1996

التاريخ: 2011/3/6
الرقم: 758 / 1-3

الأفاضل

السادة/ مدراء ومديرات المدارس الحكومية

الموضوع: تسهيل مهمة باحث

يطيب لنا أن نهدىكم أطيب التحيات.

نود إعلامكم بموافقة مجلس أبوظبي للتعليم على موضوع الدراسة التي ستجريها الباحثة/ **Monika Ann von Oppell**، مستشار تعليم اللغة الإنجليزية في مجلس أبوظبي للتعليم، من وتود إجراء مشروع بحثي في مدارس أبوظبي بعنوان: (تقييم العوامل المؤثرة في تنفيذ معايير مناهج اللغة الإنجليزية في المدارس كجزء من عملية إصلاح التعليم) لذا يرجى التكرم بتسهيل مهمة الباحثة ومساعدتها على إجراء الدراسة.

شاكركم حسن تعاونكم

محمد سالم محمد الظفاري
مدير التنفيذي لقطاع العمليات المدرسية



Aisha ALDarmaki

صندوق بريد: 36005، أبوظبي - أ.ع.م. هاتف: +971 2 615 0000، فاكس: +971 2 615 0500، البريد الإلكتروني: info@adec.ac.ae
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Appendix 10

Curtin University Permission for Research

Memorandum

| | |
|----------------|---|
| To | Monika von Oppell, SMEC |
| From | Pauline Howat, Administrator, Human Research Ethics Science and Mathematics Education Centre |
| Subject | Protocol Approval SMEC-21-12 |
| Date | 7 June 2012 |
| Copy | Jill Aldridge, SMEC |

Office of Research and Development
 Human Research Ethics Committee
 Telephone 9266 2784
 Facsimile 9266 3793
 Email hrec@curtin.edu.au

Thank you for your "Form C Application for Approval of Research with Low Risk (Ethical Requirements)" for the project titled "*Investigating the influence of teacher beliefs in making the change from a traditional teaching paradigm to a socio-constructivist one*". On behalf of the Human Research Ethics Committee, I am authorised to inform you that the project is approved.

Approval of this project is for a period of twelve months **1st June 2012 to 31st May 2013**.

The approval number for your project is **SMEC-21-12**. *Please quote this number in any future correspondence.* If at any time during the twelve months changes/amendments occur, or if a serious or unexpected adverse event occurs, please advise me immediately.



PAULINE HOWAT
 Administrator
 Human Research Ethics
 Science and Mathematics Education Centre

Please Note: The following standard statement must be included in the information sheet to participants:
This study has been approved under Curtin University's process for lower-risk Studies (Approval Number SMEC-21-12). This process complies with the National Statement on Ethical Conduct in Human Research (Chapter 5.1.7 and Chapters 5.1.18-5.1.21).
 For further information on this study contact the researchers named above or the Curtin University Human Research Ethics Committee. c/- Office of Research and Development, Curtin University, GPO Box U1987, Perth 6845 or by telephoning 9266 9223 or by emailing hrec@curtin.edu.au.

Appendix 11

Education Director Permission for Research

Dear monika

you are approved to start your survey in Abu Dhabi schools.

Regards,

Aisha

Aisha al darmaki
Training Officer
Abu Dhabi Education Council (ADEC)
Email: aaesha.aldarmaki@adec.ac.ae
Phone: 026903280

From: Mohammed Salem Al Dhahiri
Sent: 22 February 2011 08:40 AM
To: Aaesha Al Darmaki
Subject: FW: Research Approval-Monika Oppell

لاجراء انكم

Mohammed Salem Al Dhahiri
Executive Director
School Operation Sector
Abu Dhabi Education Council
Tel: 026651800 - Fax: 026676661
Email :mohammed.aldhahiri@adec.ac.ae

From: ADEC Research
Sent: Sunday, January 30, 2011 2:04 PM
To: Mohammed Salem Al Dhahiri
Subject: Research Approval-Monika Oppell

سالم الظاهري الموقر سعادة الاستاذ/ محمد
وبركاته، وبعد،،، السلام عليكم ورحمة الله

مكتب سعادتك لاتخاذ ما ترونه مناسباً، بشأن مخاطبة بناء على طلب الدكتور مسعود بدري بتحويل الموضوع أعلاه إلى
والسماح لها بإجراء الاستبيان الخاص بالدراسة التي تقوم بها على المدارس الحكومية / Monika Von Oppell / السيدة

قبل مكتبنا في هذا الشأن والمدارس النموذجية بإمارة أبو ظبي، علماً بأنها قد استوفت كافة الشروط المطلوبة من
بالدراسة المشار إليها وتجدون سعادتك رفق هذا كافة المستندات الخاصة
الاحترام،،، وتفضلوا بقبول وافر

حلمي رمضان عبد الله سعده
وحدة البحوث والتخطيط وتقييم الأداء - مساعد تنفيذي