6TH GRADE SCIENCE TEACHERS' PERCEPTION AND IMPLEMENTATION OF THE SCIENCE CURRICULUM AT A SAUDI SCHOOL IN KUALA LUMPUR

ALBALAWI, ANOUD MOHAMMED H

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ABSTRACT

For decades, the Saudi Arabia government has been emphasising on education as one of the main factors for the national development. Thus, it annually improves the educational system including curriculum, training programs and school infrastructure. However, the literature argues that teachers were not involved in the decision-making and planning of educational developments which in turn affects their perception and implementation of curriculum and its objectives. This study therefore aims to explore teaching science from the teachers' points of view of the current science curriculum. It also seeks to analyse the extent to which these teachers implement science curriculum. The study is a qualitative in nature which uses semi-structured interviews and classroom observations. It follows the theoretical frameworks of Vygotsky (1978) and Mezirow (1991) Transformative Learning Theory. The research data are collected from three science teachers who teach the sixth grade at the Saudi Schools in Kuala Lumpur, Malaysia. The findings of this study suggest that the teachers believe that the content of the current sixth grade science curriculum is informative and prescriptive in nature. It is suitable for the students' level as well as their culture, society and religion. Moreover, teachers also perceived that the curriculum focuses towards enhancing students' scientific skills and knowledge and relates to their daily life challenges. It is also found that teachers apply various teaching methods including discussion, lecturing and exploratory. However, teachers' implementation is found to be partially affected by the lack of certain modern teaching tools and laboratory equipment as well as an appropriate teacher training on these tools and equipment.

PERSEPSI DAN IMPLEMENTASI GURU-GURU SAINS DARJAH ENAM DI SEKOLAH SAUDI DI KUALA LUMPUR

ABSTRAK

Selama beberapa dekad, kerajaan Arab Saudi telah menekankan kepentingan pendidikan sebagai salah satu faktor utama bagi pembangunan nasional. Oleh yang demikian, sistem pendidikan yang terdiri daripada kurikulum, program latihan, dan infrastruktur sekolah, diperbaiki setiap tahun. Walau bagaimanapun, literatur kajian membahaskan bahawa guru- guru tidak terlibat dalam membuat keputusan dan dalam proses perancangan pembangunan pendidikan yang akan memberi kesan kepada implimentasi kurikulum dan juga objektif. Sehubungan dengan itu, kajian ini bertujuan untuk menyelidik pengajaran sains dari sudut pandangan guru-guru berkenaan implementasi kurikulum sains semasa. Ia juga bertujuan untuk menganalisa sejauh mana guru-guru tersebut melaksanakan kurikulum sains. Kajian ini bersifat kualitatif yang menggunakan temu bual separa berstruktur, pemerhatian bilik darjah dan analisis dokumen. Ia mengikut rangka Teori Pembelajaran Transformatif Vygotsky (1978) dan Mezirow (1991). Data kajian dikumpul daripada tiga guru sains yang mengajar darjah enam di sekolah Saudi yang terletak di Kuala Lumpur, Malaysia. Penemuan kajian ini mencadangkan bahawa guru-guru tersebut percaya kandungan semasa kurikulum sains darjah enam adalah berinformasi dan perskriptif. Ianya bersesuaian dengan tahap murid-murid dan juga budaya, masyarakat dan agama mereka. Lebih- lebih lagi, guru-guru juga berpendapat bahawa kurikulum tersebut memfokuskan ke arah peningkatkan kemahiran dan pengetahuan saintifik murid-murid yang berkaitan dengan cabaran kehidupan harian mereka. Kajian juga mendapati guru-guru menggunakan pelbagai cara pengajaran termasuk perbincangan, kuliah dan eksplorasi. Akan tetapi, implementasi guru- guru

dalam kurikulum sains darjah enam terjejas akibat daripada kekurangan alat-alat pengajaran dan kelengkapan makmal serta latihan guru yang wajar berkenaan alat-alat dan kelengkapan tersebut.

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LIST OF ABBREVIATION

KSA : Kingdom of Saudi Arabia

MoE : Ministry of Education

SCT : Socio-Cultural Theory

UNDP : United Nations Development Programme

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CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter provided an overview of the current study. It began with establishing the background that introduced the topic under study, followed by the motivation for conducting the study. It discussed the current sixth grade science curriculum including its objectives, expected outcomes, materials and tools. After that, the statement of the problem, research objectives and the research questions were presented. The chapter ended with a summary summarizing the most important points discussed in this chapter.

1.2 Background of the Study

Science education has been a worldwide concern for ages. Teachers are the central nexus between curriculum, instructional resources, classroom practices, and students' achievement. In this regard, many teachers are implementing a more student-centred approach to learning (Alghamdi, 2013). However, many top-down approaches do not fully consider mediating factors to curriculum mandates and the turbulence caused during the implementation process(Alghamdi & Al-Salouli, 2013). These factors include classroom-teaching practices, student learning, and teachers' perceptions and implementations of curriculum. The relationships among these factors are closely linked to teachers' strategies for coping with challenges in their daily professional life, shaping students' learning environments, and influencing students' motivation and achievement (Johnson, 2013).

Moreover, much has been reported about the educational reforms implemented in North America, Europe, and Australia, but less is known about the reforms in African, Asian, Eastern European, and Middle Eastern countries (Atkin & Black, 2003; Ruiz-Primo, Shavelson, Hamilton, & Klein, 2002; Saka, Southerland, & Brooks, 2009; Talbot-Smith, Abell, Appleton, & Hanuscin, 2013; Van Driel, Beijaard, & Verloop, 2001). In what have been reported, preparing science teachers has been a global undertaking over the past two decades of international science education reforms (Wang, et al., 2003). These reforms have involved systemic changes at the national and local levels that include interacting subsystems of decision makers, policies, resources, schools, students, parents, and teachers (Shymansky, et al., 2012).

In the context of science teaching in Saudi Arabia, since 2008, the Saudi government has prioritised the improvement of its educational infrastructure (Al-Filali & Gallarotti, 2012). The King Abdullah bin Abdulaziz Public Education Development Project is one example of the current initiatives to support school and enhance curriculum development. The Saudi Ministry of Education (MoE) prescribed an elementary curriculum that emphasises problem-solving and critical-thinking approaches in teaching science (KSA, 2012). However, science teaching in most Arab states including Saudi Arabia suffers from an overemphasis on teacher centred approaches and memorisation of content knowledge (UNDP & KSA, 2003). A recent project launched by Saudi Arabia, aiming for the development of public education. The Saudi government project began in 2007 to implement the educational programs as a part of the overall project to improve the quality of education (KSA, 2012). The project includes extra-curricular activities and the training of male and female teachers in addition to curriculum development program.

The concerned authorities prepare an operational plan for the project that is expected to be completed within few years. Science teachers, among other teachers, are involved in the development program through training on the modern curriculum and teaching methods and instruments. The project, that the Saudi Ministry of Education is preparing to implement, seeks to improve the overall quality of education – in turn producing generations of Saudis who are expected to contribute to the development of the nation and society – by achieving a number of objectives including (KSA, 2012, UNDP & KSA, 2003):

1. To revise the educational curricula in order to comply with modern scientific and technical developments.
2. To meet with the value-based, knowledge, professional, psychological, physical, and lifestyle needs of male and female students and the re-qualification of teachers.
3. To prepare teachers to carry out their educational duties.
4. To improve the educational environment that includes the preparation for utilising information and communication technology (ICT) in education for stimulation learning.

This is to achieve a higher level of efficiency in acquiring information and training, as well as strengthening personal and creative capabilities, developing skills ,satisfying psychological needs of students, and strengthening ideas as well as national and social relations through extra-curricular activities of various kinds.

Nevertheless, these objectives set by the Saudi Ministry of Education (MoE) do not take into account teachers' perceptions on these developments (Alnefaie, 2016); a significant perspective which this study focuses on.

Therefore, the motivation of studying the Saudi sixth grade science teachers' perceptions and implementations of curriculum is realized in the fact that the researcher herself is an elementary science teacher and supervisor and seeks to give a voice to colleagues whose perceptions were not included in the design and reform of the current curriculum as well as other programs and initiatives carried out by the Saudi government as aforementioned (OECD, 2020). Teachers' perceptions can benefit in future reform as well as government programs for teachers' professional development that will significantly contribute to the quality of education in Saudi Arabia.

The next section discussed the reform of the previous sixth grade science curriculum and the development of the current. It explains its objectives and content.

1.3 The Current Sixth Grade Science Curriculum

Curricular reform has been a central contemporary issue in Saudi Arabia (Maroun, et al., 2008). For this study, sixth grade science curriculum and the changes involved in centralising curriculum development and a top-down approach to curriculum implementation are the focal points. In investigating teaching science, researchers state that the focus should be on teaching scientific thinking rather than the fundemental science background information and limited science experimental skills (Assilan, 2011). However, many teachers had indicated that the previous elementary science curricula and locally developed textbooks contained superficial information as well as a minimal number of exercises and experiments that failed to encourage students to attain knowledge through observation, comparison, and the employment of critical-thinking skills (Alghamdi & Al-Salouli, 2013). Moreover, the previous curricula and textbooks (in effect from 1999 to 2008) were based on teacher-centred approaches and on pedagogies that encourage memorisation. The negative impacts of

the previous science curriculum in Saudi Arabia encompass the following points (Al-Abdulkareem, 2004):

1. Science teachers and science textbooks are the only scientific resources for learners.
2. Extensive concentration on quantity in science content, through the addition of extra-scientific ideologies in learners' books.
3. The only way of assessing student's performance is by evaluating their memorisation capacity.
4. The educational scheme was structured for conventional methods in teaching science, through offering lectures.
5. The size of the class, inclusive of the quantity of students and the dimensions of the classroom, never supports any form of empirical approaches.

Nevertheless, an effective education reform involves a systemic planned change that requires understanding of the existing context, organisation of schools, educational policy, and curricular decisions (Almazroa, & Al-Shamrani, 2015). This context provides a baseline for contrasting the existing status to the desired status and for insights into the sociocultural factors influencing a change. These comparisons will identify potential barriers of a change and the magnitude and direction of changes required to achieve the desired reform (Haddad & Demsky, 1995).

According to The Economist report (13 July 2013), Saudi schools failed to help students in achieving basic knowledge in the sixth grade science. The Economist further suggested that Saudi schools do not only generate poor quality but also fail to encourage brighter students. It claimed that many students complained that due to heavy attention paid to subjects such as Arabic and Islamic studies; Saudi schools fall behind in covering science, technology and other areas.

As part of its ongoing curriculum development program, the Saudi MoE introduced the current science curriculum in collaboration with the Obeikan Research Development Company in 2008. This curriculum is partly based on a translation of science textbooks produced by the American publishing company McGraw-Hill. The agreement with McGraw-Hill "allows Obeikan Education to translate, localise and sell McGraw-Hill Math and Sciences curricula, grades K–12, to Ministries of Education across the Arabic Region" (Obeikan, 2012, para. 11). The curricula place heavy emphasis on student-centred learning and understanding of concepts instead of memorising them. They attempt to make meaningful connections to students' lives and experiences. The current curricula adopt a teaching approach based on the constructivist theory of learning with an emphasis on critical thinking and problem-solving. In the context of the current sixth grade science curriculum, the following goals are set by the MoE:

1. Understanding Science

The Saudi sixth grade science curriculum aims to guide students to develop an awareness of science and how it relates to their culture and their lives.

2. Developing Scientific Views of the World

The curriculum emphasises that students should be able to use their knowledge of science to make their world more comprehensible and more interesting.

3. Establishing Scientific Habits of Mind

Students should develop a positive attitude toward learning science, and if students are to be scientifically literate, they must possess certain scientific values, attitudes, and ways of thinking. These values include: 1) a respect for the use of evidence, and 2) an appreciation of logical reasoning in constructing scientific arguments.

Moreover, the sixth grade science curriculum is of two volumes. The first volume is taught during the first academic semester and the second volume is taught during the second academic semester. Every volume contains three units and each unit has two chapters. Therefore, the curriculum consists of six units containing twelve chapters. The first volume discusses the topics of Diversity of Life: classifying living things and cells, Patterns of Life: genetics and ecosystems, and Earth and Its Resources: soil and energy. The second volume discusses the topics of Space: earth, sun and moon, and astronomy, Matter: classifying matter and Chemistry, and Forces and Energy: exploring forces and exploring energy. These topics discussed in the sixth grade curriculum are a continuation of what students have learned in the past grades, and they will be progressively discussed in the following grades.

The contents of the textbooks include a variety of activities which take into consideration the level of lessons and at the same time the principle of individual differences among students. Moreover, textbooks include images that reflect the concepts of units and lessons, which in turn make it easier to be understood and acquired. Also, they provide various types of evaluation and assessment directions. The books' philosophy emphasise the importance of the acquisition of scientific methodology in the student's thinking, mental development, and practical skills. Booklets of activities are prepared to contribute to the enriching of the implementation of scientific knowledge of students and improving their research skills.

According to the introductions of the current sixth grade science student's books, the science textbooks for the sixth grade are crucial parts of the primary science curriculum development project, which aims to make a significant evolution

in the teaching and learning of science. It emphasizes that students play a key role in the teaching and learning process. Thus, it can be said that the current sixth grade science curriculum adopts a student-centred approach.

The next section identified the research problem that this study attempted to tackle.

1.4 Statement of the Problem

The need to improve the quality of science teaching for citizens so that they develop scientific literacy to cope with the demands of science and technology growth has been the yearning of Saudi Arabia in the 21st century. Such efforts have been made by researchers with the support of key stakeholders in science education indicating that teacher quality including their perceptions needs to be addressed (Al-Abdulkareem, 2004). Teachers' perceptions of the curriculum are one of the most important factors inhibiting science learning in the Saudi schools (Madani & Forawi, 2019). According to Alruwais, Abdulhamid and Alshalhoub (2011), the current science curriculum has been designed to develop the creativity and abilities of students so that they can gain comprehensive understandings of the scientific materials, develop concepts, solve problems, and communicate and use technology. However, the literature showed that many teachers still adopt traditional teaching methods such as lecturing which is a strategy that makes students passive learners (Al-Shammari, 2015). Moreover, Hilat (2008) argued that most science teachers do not apply 'investigation strategy' or 'inquiry' which has been integrated in the current science curriculum to develop creative thinking skills among students. The literature (e.g. Hew & Brush, 2007; Lee & Tsai, 2010; McKnight, et al., 2016; Niess, 2005; Sadik, 2008; Sang et al., 2010; Tondeur, et al., 2017) also found that there is a sharp decline in integrating technology and that teachers do not encourage students

to search, explore and communicate, while most science curriculums stipulate the use of technology in science lessons. The use of technology in education has been commended for its ability in increasing opportunities for students (NETP, 2017).

Furthermore, science teachers tend not to teach students to formulating hypothesis, interpreting data and drawing conclusions (Abdi, 2014; Scherer, 2016; Smart & Marshall, 2013). Therefore, there is a wide gap between the objectives of the recent curriculum development projects and what is implemented in real teaching settings (Al-Shammari, 2015). In this regard, Alshethri and Aljumaiah (2010) claimed that the developed curriculum exceeds teachers' abilities. This problem affects the science teachers which in turn negatively impacts on the teaching practices thus the students' outcome. However, is it true that what teachers perceived of the curriculum varies with the curriculum demand?

Nevertheless, minimal research attention has been directed toward understanding teachers' perceptions which influences their teaching practices particularly within the Saudi context (Alshamrani, 2017). Needless to say, teachers have strategies for coping with challenges in their daily professional life, shaping learning environments, and influencing students' motivation and achievement (Al-Seghayer, 2011).

To spell it out, this research tackled the problem of the absence of science teachers' perceptions in curriculum reforms and teachers' professional development projects set by the Saudi government in its attempts to enhance science education in Saudi Arabia. This absence of teachers' perceptions, as discussed earlier and further elaborated in the literature review, led to a limited success in achieving the government's goals due to teachers' implementations and classroom practices that are not in line with the science education expectations set in the curriculum.

Therefore, to fill the gap in literature and to inform stakeholders in science education in Saudi Arabia, the present study sought to examine teachers' perceptions of the current science curriculum for the sixth grade at the Saudi Schools in Kuala Lumpur using qualitative approach to better understand the conceptions of these teachers and their reflections on the implementation the sixth grade science curriculum.

The next section stated the research aim and objectives that this study attempted to achieve.

1.5 Research Aim and Objectives

This study aimed to explore teaching science from the teachers' points of view as well as their implementation of the current sixth grade science curriculum. The objectives of the study were:

1. To investigate the Saudi teachers' perceptions on the sixth grade science curriculum.
2. To explore the extent of the Saudi teachers' implementation of the sixth grade science curriculum.

The next section articulated the research questions that this study attempted to answer.

1.6 Research Questions

Starting with several pertinent questions is important to articulate the research gaps and problem and direct the study toward the appropriate methodology. The current study answered two research questions.

1. What are the Saudi teachers' perceptions on the sixth grade science curriculum?

2. To what extent do the Saudi teachers' implement the sixth grade science curriculum?

The next sections set the significance of the study, research limitation and scope of the current study.

1.7 Significance of the Study

This research investigates the teachers' perceptions and instructional practices of the current science curriculum in the Kingdom of Saudi Arabia. The study area requires more investigation to enhance teaching effectiveness. The current study aims to get a deep understanding on how the science teachers perceive, acknowledge, and implement the current science curriculum in Saudi Arabia. Moreover, it aims to gain an insight into the educational system of the kingdom of Saudi Arabia and its improvement in general as well as academic achievement of Saudi students in the modern science curriculum. The results of this study shed light on the importance of teachers' perceptions and views regarding educational issues that can be addressed through the use of appropriate Saudi literature to formulate future policy (Oyaid, 2009). Therefore, this study also provided data to the Ministry of Education (MOE); so that, It could help in the future research, reform, policies and recommendations.

1.8 Limitation and Scope

This research was limited based on its objectives to the study of three Saudi science sixth grade teachers' perceptions on the current curriculum at the Saudi Schools in Kuala Lumpur. The limitation of the number of participants is due to the fact that only three science teachers teach the sixth grade curriculum at the Saudi Schools in Kuala Lumpur. In other words, the study was limited to a sample size of three sixth grade science teachers at a Saudi school in Kuala Lumpur. Although the same size is small, other measures were taken to ensure the validity of the findings. Moreover, in

accordance of its objectives, this study was limited to the perceptions of teachers rather than principals, supervisors or students.

Due to the constrains in time frame for data collection, the scope of the current study only focused on the lessons of chapter seven of unit four of the Saudi sixth grade science curriculum. The reason behind selecting this chapter was not only that this chapter was the one being taught during the current research data collection, but most importantly; this chapter contains different teaching skills which are clearly observable in a classroom teaching practices.

The next section summarized the points discussed in chapter one.

1.9 Summary

This chapter offered a background on education in Saudi Arabia including its challenges and efforts of overcoming these challenges, mainly in teaching and learning of science. It also provided insights of the MoE initiatives to develop education in Saudi Arabia by offering the latest curricular. It then established the problem of the study in which the teachers' perceptions of the current science curriculum was overlooked. Then, it stated the research objectives and questions which sought to fill the gap in literature and provide detailed views of science teachers in order to ensure a successful learning process.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter analysed the current sixth grade science curriculum and discussed the related theories and literature on science education and education in Saudi Arabia. Several theories and studies which meet with the current research in a point or more were presented and discussed. The chapter also offered an outline of latest studies in the field where the current study was concerned in order to highlight the gap in literature.

The discussion of teachers' perceptions and implementation of science curriculum should be in the core of any educational reform which in turn is crucial to the enhancement of science education quality. Generally, educational reform efforts focus on science education. Specifically, reformers suggest that teachers should use inquiry-based and student-centred instructional practices that facilitate students' cognitive construction of knowledge (Benedict-Chambers, Kademian, Davis, & Palincsar, 2017; Roseman, Herrmann-Abell, & Koppal, 2017). Recently released standard documents in elementary science education indicate that the current science curriculum must also be reformed, suggesting that reformed curriculum should include fewer topics that can be taught and studied in greater depth (Berland & McNeill, 2010; Schweingruber, et al., 2007). Several administrative districts have made science education an essential part of their overall effort to improve instruction for students in their schools. However, reform-based curriculum designed to support students' construction of knowledge in science relies on teachers who possess enhanced science literacy and an understanding of how students learn science (Schneider & Krajcik, 2002). For many teachers this will mean significant study of

science concepts and significant changes in their instructional practices. Since what teachers do in their classrooms depends largely on their knowledge, they need to learn a lot to be able to enact reform-based curriculum (Cervetti, Kulikowich, & Bravo, 2015).

To account for teachers' perspectives and implementation, one should first examine the curriculum. The next section, therefore, offers a brief analysis of the current Saudi sixth grade science curriculum.

2.2 Analysis of the Saudi current sixth grade science curriculum

a. The objectives of teaching science curriculum for the sixth grade:

Overall, the curriculum has six objectives. The first objective is to shift the learning process from teacher-centred learning to student-centred learning, allowing more student engagement in the learning process. The second objective is to motivate learning through multimedia, benefiting from technology in the learning process. The third objective is to provide learning through various approaches, ensuring the understanding of students of the lesson. The fourth objective is to encourage learning through cooperative learning, to exchange, communicate and describe knowledge in different ways, catering for students' individual learning differences. The fifth objective is to have active learning based on exploration and investigation, allowing students to experience science. The sixth objective is to develop students' decision-making skills, and to relate learning to real life contexts.

b. Expected Learning Outcomes:

The expected learning outcomes were provided to enable teachers to assess and monitor the learning process.

1. Advance Learning.

Science curriculum for the sixth grade was designed to equip students with the basic knowledge and skills through: a) Developing thinking and problem-solving skills, b) Promoting humble learning capabilities, c) Expressing and communicating scientific facts, d) Employing technology to improve learning process, and e) Promoting self-study.

2. Developed Learning Materials.

The current sixth grade science curriculum was developed to include the following learning materials, that are hoped to support the learning process and achieve better results. These materials are a) student's book, b) video, c) teacher's manual, and d) enrichment website.

3. Annual Evaluation and Development.

All learning products are evaluated, updated and developed annually for all grades. This is based on the reports that the Ministry of Education receives about the quality of these products.

c. Activities

1) Series of science books for the sixth grade includes activities which involve: exploratory activities at the beginning of each lesson, 2) survey activities which support and expand learning process, and 3) research activities which develop the skills of critical thinking.

In other words, the sixth grade science books have a set of activities. The activities placed at the beginning of a lesson pave the way to the lesson and provide background information. These activities help teachers to assess the current knowledge of students on the topics which they are going to discuss with the students. Moreover, the activities placed within a lesson aim to support the

explanation of the lesson to achieve better understanding. In addition, some other activities aim to develop students' research skills.

d. Content Based on Certain Standards.

The content of the sixth grade curriculum was developed in a way that maximizes students' understanding of science through the following procedures: 1) highlighting important vocabularies and terms and supporting them by scientific illustration, 2) adding pictures, diagrams and illustrations that promote the understanding of the scientific terms, and 3) integrating learning model which attracts the students' attention.

e. Considering Individual Differences.

Of the main features of the current sixth grade science curriculum are: 1) providing practical concepts, and 2) including various learning tools suitable for students' individual differences.

f. Assessment

The current sixth grade science curriculum adopts the following assessment types in ensuring and evaluating students' understanding: 1) diagnostic assessment, 2) formative assessment, 3) summative assessment and 4) chapter revision.

2.1.1 Teaching approaches proposed by the curriculum

The curriculum recommended a framework (see Figure 2.1) for the learning cycle for teachers. It has five phases; namely: warm-up, exploration, explanation, assessment and enrichment and elaboration. Firstly, the Warm-up stage aims at attracting students' attention. It then moves to the Exploration stage which provides the students with the practical experience to develop the concepts of the lesson. The third stage, Explanation clarifies and explains the concepts and makes the content of the lesson understandable through providing vocabularies and pictures. Assessment,

the fourth stage, is set to assess the students' understanding. The fifth stage, Enrichment and Elaboration, links the general scientific ideas with those of other areas in life. Figure 2.1 illustrates the learning cycle.

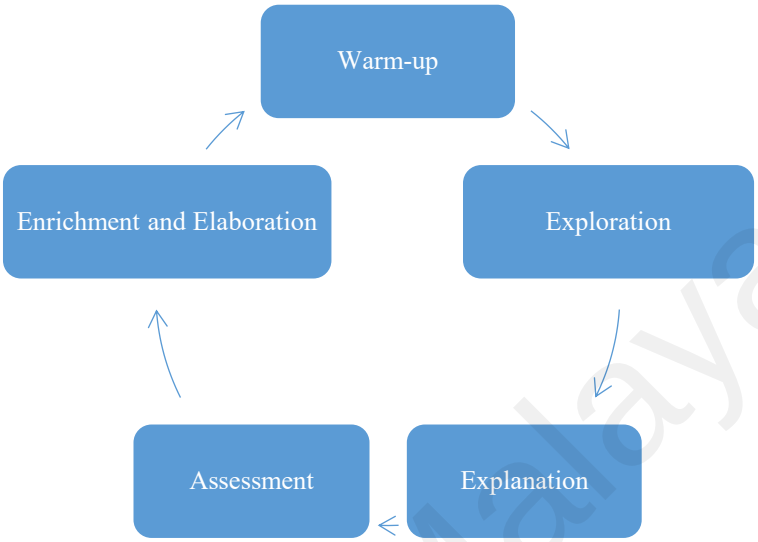

Figure 2.1 Learning Cycle (source: the current 6th Grade Science Curriculum)

2.3 Review of Literature

This section established the gap in literature that this study sought to bridge and fill. The gap between the theoretical and practical dimensions was highlighted in the related literature, paying attention to the teachers' perceptions. In this study, teachers' perceptions were considered a key factor of a successful education. Appendix G outlined the main objectives, methodologies and findings of latest related studies, extracting the current research gap. The following is a discussion of relevant literature.

Albadi, Harkins and O'Toole (2019) aimed at researching both science teachers' and students' perspectives at the secondary level in Saudi Arabia. The problem addressed in this paper was the comprehensibility of science curriculum which was adapted from American's science textbooks as part of the Saudi

educational reform, considering the fact that materials were translated from English into Arabic. The authors argued that there are key concepts lost in translation which may contributed to the low academic achievement of students in Physics class. Moreover, the authors claimed that the current adapted Physics textbook may not be in line with the Saudi culture and environment. To so investigate, a qualitative data was collected through six female 10 grade Physics teacher interviews and a quantitative data was collected through their 360 female student questionnaire responses. While the qualitative data was thematically analyzed under three key themes: teacher preparation and resourcing, challenges to textbook understanding, and curriculum content, the quantitative data was manually coded by the authors and processed through SPSS. The results suggested that the teachers had different views on the curriculum; some were in favour of the old curriculum, and others were in favour of the current one. Nevertheless, the teachers agreed that teacher training is required to better understand the current curriculum and its possible teaching strategies. On the other hand, students favour more laboratory experiments which were limited due to lack of tools. Finally, the authors concluded that the current curriculum should be reformed and that local teachers should be involved in the reform process.

While Albadi, Harkins and O'Toole (2019) offers a recent perspective on the teachers' views of science curriculum, it does not cover the elementary level where it all begins.

Similarly, Madani and Forawi (2019) examined the Saudi science and mathematics teachers' perspectives of the current curricula and the impact of their perspectives on their classroom practices. In their paper, the problem tackled by the authors was the failed implementation of Science, Technology, Engineering, and

Mathematics (STEM) curriculum in Saudi Arabia as part of the national educational reform. The authors claimed that the unsuccessful implementation of STEM was a result of the absence of clear instructions, project description and purpose, and application framework. They also argued that the marginalisation of the teachers' perspective in the Saudi educational reform and curriculum implementation is a significant factor to a failure reform. To investigate such, the authors applied a mixed method approach to collect their data. While interviewing teachers and classroom observations served as a qualitative data, questionnaires served as a quantitative data. Those questionnaires were sent to both male and female high school science and mathematics teachers in 13 regions nationwide, generating 543 valid responses for analysis. In analyzing these responses, various variables were considered: subjects taught, educational qualifications, years of teaching experience, nationality and gender. The results, as the author concluded, suggested that teachers were positive toward the implementation of the current science and mathematics curricula, applying new teaching tools and adopting more student-cantered learning approach. While variables like gender and nationality were found insignificant, other variables like educational qualifications, teaching experiences and subject taught were found significant in quantitively analyzing teachers' perspectives. Nevertheless, the results from the qualitative data suggested that teacher development programs were not offered before implementing the current curricula thus teachers were not qualified and prepared to carry out this essential part of the Saudi national educational reform. Despite that, teachers positively perceived the current curricula as advanced and suitable to modern day and students' lives.

While Madani and Forawi (2019) shares the same research focus point with this study, it did not consider the founding science curriculum being taught at the elementary level, an essential aspect taken into account in this study to allow a bigger picture of the scene. Their paper also did not offer excerpts from the interviews with teachers and notes from the classroom observations to support their conclusions.

More specifically, as part of teachers' perspectives, Alshamrani (2017) investigated the Saudi science teachers' assessment practices. The problem studied in this article was the absence of science teachers' voices in selecting the assessment approach in the context of prescribed assessment approaches in the curriculum that do not cater to teachers' different teaching strategies and styles. The author emphasized on the classroom assessment on two scales; summative assessment and formative assessment. He argued that formative assessment has been recently transformed from a tool for assessment of learning to an assessment for learning. He furthered that the significance of formative assessment is the feedback that allows the learning process. Questionnaire responses from 40 science teachers from all school grades within the Alzelfy educational administration were collected for analysis. Variables such as academic qualifications, experiences and training courses on assessment were considered in the analysis. The results suggested that while teachers' assessment was high on in-class questions, and discussions and participations, written and oral exams, student's folio, homework, projects and research was moderate, and student-student assessment, essay writing, presentations, student self-assessment and student's activity notebook was low. The results also revealed that the variables were insignificant to teachers' selecting of assessment approaches, which raised questions about their contribution to education development. The study concluded that although teachers' practice summative

assessment to meet the administrations' requirement and for statistical purposes, they practice more formative assessment to give feedback to students and their parents in a way that enable continuous learning and enhancement.

Nevertheless, while Alshamrani (2017) is a significant study focusing on the aspect of teachers' assessment to investigate the impact of science teachers' perspectives on the current curriculum, the failure to identify the impact of variables such as academic qualifications, experiences and training courses on assessment is questionable. Moreover, although Alshamrani (2017) aimed at giving voice to science teachers, no interviews were carried out with the teachers.

In another study, Alosaimi (2013) researched the Saudi science teachers' and inspectors' perceptions and implementation degree of the current curriculum. The study focused on the aspect of critical thinking skills integrated in the current Saudi science curriculum. Its adopted methodological approach is a mixed method of both qualitative and quantitative using interview in its various types: structured, semi-structured and open. The participants were 98 intermediate science teachers and inspectors both male and female from schools of the city of Taif in Saudi Arabia. The study successfully contributed to the body of knowledge in terms of the different views provided on the current Saudi science curriculum. In this regard, the study argued that teachers negatively viewed the current science curriculum as it focuses on quantity rather than quality and that there is insufficient time and materials available for teaching. This in turn discourages the students' critical thinking skill. However, science inspectors believed, as the study claimed, that the current science curriculum contributes to the students' critical thinking skill.

While Alosaimi (2013) shares the same research focus point with this study, it did not consider the founding science curriculum being taught at the elementary level, an essential aspect taken into account in this study to allow a bigger picture of the scene.

In another yet a Saudi context, Alaudan (2014) studied the English language Saudi student teachers' perceptions toward formative assessment as part of the Saudi educational constructivist approach integrated in the current curriculum. The study adopted a mix method and action research to achieve its objectives. The participants were eleven female student teachers of the third year who teach different educational levels at various schools in Saudi Arabia pre and after their placement. In addition to the student teachers, six of their tutors were involved in the study. The participants were observed, filled questionnaire and interviewed (semi-structured questions). The study found that student teachers were unaware of the formative assessment. It also concluded that teachers' abilities and class time limitations were among the main factors affecting classroom practices. Therefore, it suggested training programs for pre-service and in-service teachers to bridge the gap between theory and practice.

While Alaudan (2014) focused on a significant part of the current Saudi English language curriculum, formative assessment, it did not consider all of the objectives and skills integrated in the curriculum in its analysis, a shortcoming which this research attempted to overcome in its study of the Saudi sixth grade science curriculum.

Moreover, Alfares (2014) examined the Saudi intermediate English (EFL) teachers' behaviours and perceptions toward current English language curriculum in supporting thinking skills. The study also analysed the curriculum tasks and their implications by the teachers. To achieve its objectives, it adopted a mix method in

which an analysis of the third intermediate English language textbook was carried. In addition, observation, questionnaire and interviews were used to collect the research data. The participants were six EFL teachers from five intermediate schools in Saudi Arabia. The study found that the current curriculum does support teachers to promote thinking skills. It also found that the productivity of tasks depends mainly on teachers' behaviours. Therefore, it suggested a development to the current Saudi English language curriculum in order to help teachers promoting thinking skills and meeting the latest technologies.

Similarly to Alfares (2014), this study investigated the perceptions and implications of the Saudi teachers; however, it extended its focus to science teachers' perceptions and the overall implications of all skills, rather than Alfares (2014) thinking skills.

In a regional non-Saudi context, Alshammari (2014) investigated the latest implemented science curriculum in Kuwait through the perceptions of teachers, students and reformers. The study adopted a mix method for data collection including classroom observations, questionnaires and in-depth interviews. The participants were 310 science teachers of sixth and seventh grades, 647 students and nine reformers. The study found that both teachers and students negatively perceived the latest adapted science curriculum in which they established that the content does not meet the local culture and religious teachings and that the objectives of the curriculum neither clear nor achievable. It also found that teachers were unable to teach the latest curriculum due to the lack of instructional tools and large classroom sizes.

While the findings of Alshammari (2014) were significant for the reform program directed by the Ministry of Education in Kuwait, this study aimed to extend this significant work to the context of Saudi Arabia in order to offer the Saudi educational policy makers a clear insight of the teachers' actual perceptions and implications of their reform program in regard to the sixth grade science curriculum.

In an international context, Wei and Li (2017) examined teachers, students and scientists' perceptions on the included experiments and activities in the secondary school science curriculum in China aiming to reform the current textbooks and exercise books to support the teachers' abilities and the students' thinking skills and everyday practices. To achieve its objectives, this study adopted a grounded theory approach as a data collection and analysis framework. The research data analysis was a mixed method in nature collected through qualitative interviews with a total of 87 science teachers whose number of years of experience range between 1 to 22 years. The participants were teaching at 12 secondary schools in three cities of the province of Guangdong, China. The findings suggested eight dimensions of experiments: pedagogical, safety, temporal, social, material, procedural epistemological and conceptual. The share of these dimensions found to be unequal when carried by the students comparing with those carried by the scientists. The study suggested that a reform of science curriculum may be carried to amend the included experiments to be in line with the everyday practices 'real' scientific practices. It also argued that the various dimensions need to have an equal share in practice.

While Wei and Li (2017) investigated a fundamental part of the science curriculum i.e. experiments through the investigation of teachers' perceptions and implications similarly to the current study, it applied its study on the secondary level

without consideration to the curricula of the preceding grades that the current study aimed to focus on.

Moreover, Jedrosz (2016) studied the perceptions of secondary school teachers and students on the effect of the location and space of science lessons on the learning process. The study applied the Activity Theory to its case study collecting the data through a mixed method represented by photography, one-to-one teacher interview, interviews with a small group of pupil, questionnaire and lesson visits (observations). The study found that science teachers were aware of the importance of practical activities integrated in the science curriculum; however, little practical work was done due to the lack of laboratories. It was also found that students enjoyed science class especially the practical part.

Jedrosz (2016) shares the same focus of the current study by investigating the perceptions and the implications of science teachers; however, it studied the secondary level overlooking the preceding grades including the elementary level in which students start to learn science, a gap that this study attempted to overcome.

Further, Brewster (2015) examined the science teachers and students' perceptions on the critical thinking skills integrated in the national science curriculum in Trinidad and Tobago. The participants of this study were seven science secondary school teachers from St Francis School and 15 top students from the same school. The research data was collected for the purpose of a qualitative approach represented in a case study by means of content analysis of the curriculum documents, exercise books and textbooks, lesson observation, focus groups interview with students and structured interviews with teachers, and NVivo software for coding the research data. The study found that the current science curriculum in Trinidad and Tobago failed to promote students' critical thinking. Accordingly, the study

suggested that a development of the science curriculum for secondary level may be carried out and that teachers need to be trained on how to encourage and support students' critical thinking.

While Brewster (2015) studied an essential part of the science curriculum i.e. critical thinking skill, it did not review the issue in a larger context e.g. the preceding grades science curriculum and the overall skills and objectives set for this particular grade curriculum that this study aimed to integrate in its investigation.

Furthermore, Yeonsuk (2013) studied the science and mathematics teachers' change after shifting the medium of instruction from Korean into English in a special program in Korea. The study aimed to examine the impact of the teachers' perceptions and practices as part of the curriculum reform in Korea. It adopted a qualitative approach through one-to-one semi-structured and open-ended interviews, classroom observations and field notes. The participants were four female elementary school teachers in Korea. The findings suggest that teachers were concerned with the challenges of English language skills in limiting their teaching ability due to their limited English proficiency. Nevertheless, teachers stated that such experience evaluated their abilities and encouraged them to further develop their professional experiences. The study, therefore, discussed that the teachers' perceptions of curriculum reform changed after they experienced the new strategies and been trained. It concluded that teachers' abilities can be expanded and well established to meet the new curriculum through explanation and training which in turn are reflected in the teachers' confidence of their abilities which lead to a better learning process.

The study of Yeonsuk (2013) on the impact of the change of the medium of instruction of science curriculum from Korean into English offers a context reference to discuss in the current study of the perceptions and implications of science teachers

at the Saudi Schools in Kuala Lumpur, Malaysia where English is a second language and Arabic is a foreign language.

Finally, Fraser (2010) investigated the effect of the primary school science teachers' professional development on the teachers and students' educational experience in North East Scotland. The study applied an activity theory perspective to its mixed method collected data. Its quantitative data was collected through questionnaires distribution to six teachers and 118 students. Its qualitative data was collected through video-stimulated reflective dialogue with six teachers and group interviews with four students from each class. The study argued that primary science teachers' ability maintained under-developed because the science-related learning was not offered as planned. This in turn is reflected in the limitations of the students learning space set by the teachers. Therefore, both science teachers and students negatively evaluated science curriculum under the claim that it demands memorisations rather than creativity and fresh everyday practices. The study suggested that the current curriculum structures and activities are in need to be enhanced to support teachers' science-related learning thus provide better teachers' understanding and abilities.

Fraser (2010) is significant to the current study since it relates and integrates the perceptions and implications of science teachers of the curriculum to the science teachers' professional development which considers a main factor in the formation of the teachers' perceptions which in turn is reflected in their implications of the curriculum.

The review of literature showed that most studies used a mixed method for the purpose of data collection mainly interviews, classroom observations and questionnaires in order to investigate the teachers' perceptions. However, these

studies largely focused on a specific aspect of curriculum rather than on the whole. The literature illustrated that the majority of studies were conducted on the secondary and high school levels rather than the primary school level or more specifically the sixth grade curriculum. Studies conducted in Saudi Arabia were mainly concerned with other subjects such as English as well as on thinking skills rather than teachers' perception and implementation of a curriculum. Therefore, this study came to bridge the gap in literature and to investigate the Saudi sixth grade science teachers' perceptions and implications of the current curriculum at the Saudi Schools in Kuala Lumpur.

2.4 Theoretical Framework

The theoretical framework of the teachers' perceptions and implications examined in this study falls within the social constructivist tradition, with transformative learning theory serving as a lens. Current conceptualizations of social constructivism draw heavily on the work of Vygotsky (1896-1934), who began a tradition in social science termed cultural-historical psychology. Cultural-historical psychology is defined as "the study of the development of psychological functions through social participation in societally-organized practices" (Chaiklin, 2001a, p. 21). From this area of cognitive psychology stems the sociocultural learning theory (Edmond, 2001). Vygotsky (1978) studied the importance of learning in social settings and the impact of the assistance of more capable others on the development of the learner. He maintained that learners rely on the examples and skills of the experienced and more competent peers to gradually develop abilities to do certain tasks, such as talking about a scientific concept or solving a complex math problem. For Vygotsky and other sociocultural theorists, the social nature of cognitive development is captured in the concept of 'inter subjectivity', which refers to mutual, shared

understanding among participants in an activity (Vygotsky, 1978). According to Johnson (2009), this sociocultural perspective has profound implications for teaching, schooling, and education. Although Vygotsky's work principally centred on junior learners, identical processes occur in senior learners. Thus, the influence and interactions between a more knowledgeable individual, such as an expert, peer, or mentor, and an adult learner becomes a critical phenomenon for study in sociocultural learning. Though developed primarily to explain the teacher-learner relationship, Vygotsky's (1978) theory assisted in understanding the process of experienced teachers mentoring novice teachers or professional developers providing continued education and support to practicing teachers. Therefore, the current study that investigated the Saudi sixth grade science teachers' perceptions and implications of the current curriculum at the Saudi Schools in Kuala Lumpur largely meets the perspectives and objectives of the social constructivist tradition through the notion of "learning" which is also the aspect that Mezirow (1991) built his framework on as explained below.

The Transformative Learning Theory was initially developed by the Professor of Adult and Continuing Education, Jack Mezirow in 1991. His framework is concerned mainly with the learning of adults. To him, transformative learning is a "constructivist, an orientation which holds that the way learners interpret and reinterpret their sense experience is, central to making meaning and hence learning" (1994, p. 222). To further explain, learning is categorised under two main types: communicative and instrumental. Communicative learning is concerned about the way one expresses his desires, needs and feelings. Instrumental learning involves learning through determination of cause and effect relationships and task-oriented problem solving. The transformation of learning process has three dimensions:

psychological (changes in understanding of the self), convictional (revision of belief systems), and behavioural (changes in lifestyle) (Mezirow, 2000). Transformation of perspectives and schema constitute meaning structures. Schema is the structure of feelings, judgment, belief and concept that forms certain interpretation. Meaning structures are the predispositions sets emerged from psychocultural supposition which control the potentials expectations. Reflection is one main guide of meaning structures. It refers to the revision of one's beliefs that largely assimilated through culture in his childhood evaluating its validity in his adulthood. Reflection contributes to better understanding of the self thus a successful learning process. To Merizow, learning new meaning structures, elaborating meaning structures, transforming meaning structures and transforming meaning standpoints are the four main methods of learning.

The following Figure 2.2 represents the framework of the Transformative Learning Theory.

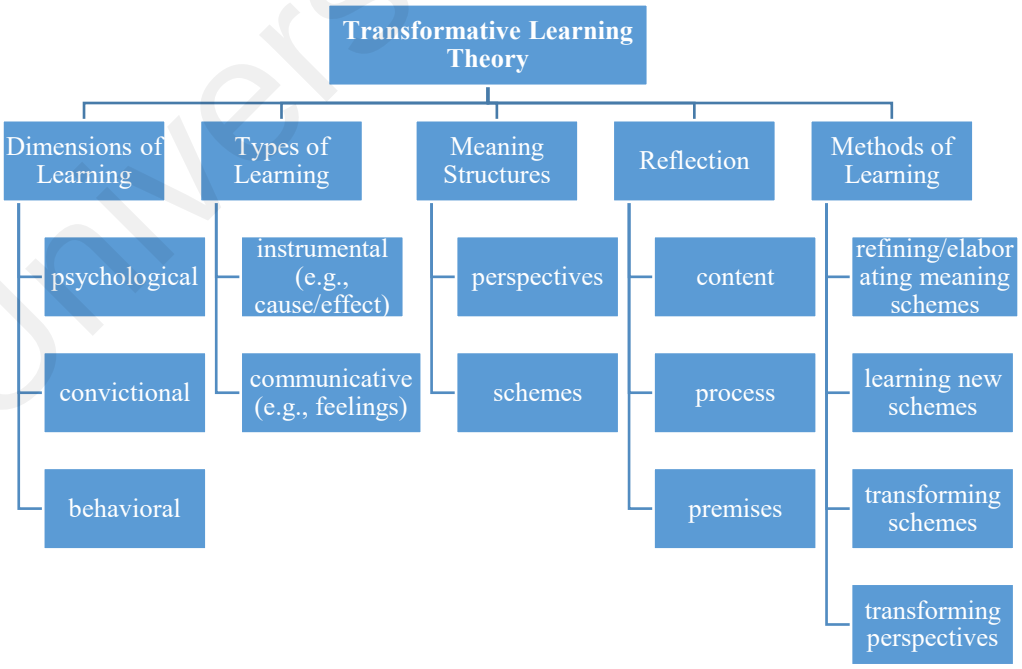

Figure 2.2 Transformative Learning Theory (Mezirow, 1991)

In other words, Mezirow's transformative learning theory is concerned with the way adult learners constitute, validate and restructure their experiences in meanings. In the process of learning transformation, schemes (particular emotional reactions, attitudes and beliefs) are transformed through the engagement of experiences critical reflection. This step evolves a perspective transformation. Meanings included in schemes may elaborate when emerging ideas are added through the learning process.

This study is interested in exploring the views and implications of the Saudi teachers on the current science curriculum including the content, teaching activities, instructional tools and methods of student assessment. These aspects are the essential parts of any learning process. Moreover, the current science curriculum was imported from the USA and adapted to suit the Saudi students' socio-cultural situation. In this respect, this study focused from a socio-cultural perspective on the science curriculum and the relationship between teaching science and its socio-cultural context. The selection of the Transformative Learning Theory as a framework adopted in this study is explained by its concern with adult learners, the sixth grade science teachers in this study, and its application for curriculum evaluation through the examination of meaning structures. In Transformative Learning Theory, meaning structures have two components; *meaning perspective* which also refers to "habit of mind" and its emerging outcome *meaning scheme* which represents the "point of view". According to Mezirow (1998), a meaning perspective represents one's assumptions which are coded into socio-cultural (including social norms and ideologies), and epistemic (including sensory preferences and learning styles). Other codes may also be found such as spiritual, scientific, ecological, political, ethical and logical (Mezirow, 2000). Meaning perspectives are expressed in meanings schemes

that are constituted through clusters of value judgment, attitudes, beliefs and values. These clusters direct the interpretation of the meaning structures.

The following figure illustrates the theoretical framework of the current study as evolved from Mezirow (1998).

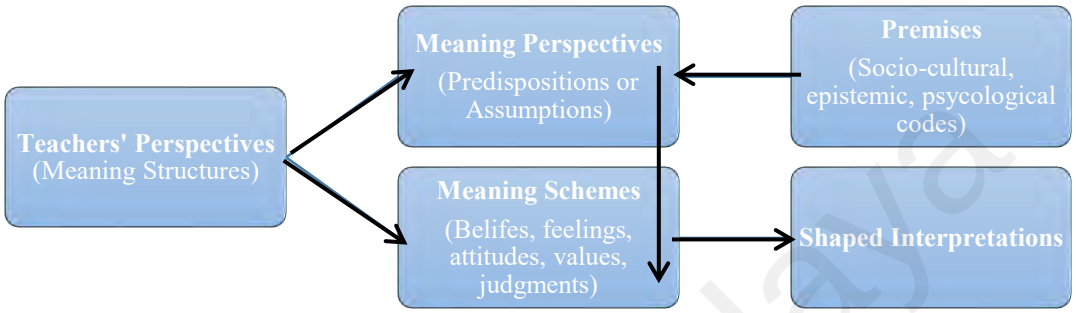

Figure 2.3 The Theoretical Framework of the Current Study

In this study, teachers' perceptions were the result of the premises that contained only two elements; the socio-cultural, and the epistemic. The premises generated the meaning perspectives that represented one's predisposition and assumption. Meaning perspectives in turn generated meaning schemes that involved exploring the teaching beliefs, attitudes, feelings and judgment. These measurements integrated in the meaning schemes that shaped the interpretation of the teachers' perspectives and guided their actions.

In the current study, the framework evolved from the Transformative Learning theory was triggered by the educational environment shift from Saudi Arabia to Malaysia. In other words, the "disorienting dilemma" that motivates the teachers' learning process and meaning structures (perceptions and implications) was the shift in the teaching context represented in the teaching in a new country i.e. Malaysia. This emerging circumstance led to a critical revision of the teachers' assumptions (meaning perspectives) and set for interpreting the meaning (meaning

schemes). This in turn led to the very notion of "learning" as introduced by Mezirow (1991) and adopted in this study. Teachers' learning can be implemented in three ways; offering spaces for critical thinking, offering spaces to relate to others who experience the same transformative process, and offering spaces to act based on new perceptions. The first way can be realized through introducing new ideas within the content of the current science curriculum. The second way is realized through allowing discussion among peers. The third way is realized through applying new perceptions. In other words, a constructivist teacher's perception on teaching science curriculum was measured based their views offered during the interviews and their practices observed during the classroom observations.

Moreover, the adoption of Transformative Learning theory as the theoretical framework in this study helped the understanding the implementation of the current science curriculum in the classroom and the activities that were used for teaching science. It was also used in this study to guide the design of the research methods for collecting data (interviews and observation), by preparing interview questions which depended on Transformative Learning Theory. Finally, it was used in discussing the findings of this study to explain the participants' responses.

2.5 Summary

This chapter established the literature review in regard to the current study. It discussed the previous theories and researches in the field of science education and teachers' perception. It illustrated the gap in literature in the lack of latest research that investigates the perceptions of school science teachers in Saudi Arabia as a key factor toward a successful education. It then explained the current study adopted theoretical framework that was structured based on the Transformative Learning Theory as developed in Mezirow's works.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

This chapter offered an exhaustive account on the research methodology adopted by this study. It explained the research paradigm, context of the study, participants' profile and selection criteria, data collection procedures. It also discussed the research data collection tools namely: interviews and classroom observations. Moreover, the chapter detailed the research data analysis procedures and then the trustworthiness. It also demonstrated how this study observed the necessary research ethics.

3.2 Research Paradigm

This study aims to investigate the teachers' perception and implementation of the science curriculum at a Saudi school in Kuala Lumpur. This research inquiry fits into case study. According to Gall and Borg (2003), A case study is a qualitative design which is widely employed in educational researches. Manion and Morrison (2007) argue that a complex topic can be informed by a case study. The phenomenon could be understood from various perspectives through extensive analysis.

Furthermore, this study adopted a basic qualitative research method in order to obtain an in-depth experience about the phenomenon under study (Roller & Lavrakas, 2015).

3.3 Context of the Study

This study took place at Saudi Schools in Kuala Lumpur which were established in 1991 and recognized by the Ministry of Education in Malaysia. The Ministry of Foreign and Ministry of Education in Saudi Arabia provide all required materials,

tools, and teachers as well as monitor the learning and teaching processes. Saudi Schools in Kuala Lumpur as a public Saudi schools which implement the Saudi curriculum and the educational Saudi rules and regulations. They have fifteen classrooms equipped with the newest technology tools and they have two science labs.

The vision of school is to aspire to develop an intelligent student with an open mind who accepts other people and produce the highest quality of education. The mission of the schools is to strive and develop an excellent educational environment with qualified teachers who use modern techniques and implement advanced teaching methods that help students to participate in various activities, and support values.

3.4 Participants' Profile: Selection Criteria

To obtain comprehensive data from the sixth grade science teachers who were reallocated by the Saudi Ministry of Education to teach at the Saudi Schools in Kuala Lumpur, a purposive sampling was adopted. The reason for using purpose sampling is to meet the researcher's needs for recruiting participants.

Since this study was discussing aspects of the Saudi science curriculum, the research sample was three science teachers from the Saudi Schools in Kuala Lumpur. The sample also consists of two male teachers and one female teacher. There are two Saudi schools in Kuala Lumpur in which one school is for male students and the other one is for female students. Because of that, the researchers selected both schools. Moreover, since the researcher is a science supervisor at the Saudi Schools in Kuala Lumpur, Malaysia, this enabled the researcher to have access into the teachers' classroom for observation as well as interviewing the science teachers. The participants were informed with their rights to withdraw from the study at any time

as volunteer participants and that their choice to participate or not in the study does not affect their jobs in anyway. In contrast, the researcher maintained a professional as well as a friendly relation with the teachers that in turn helped to gain more knowledge on their perceptions during the interviews. Table 3.1 below illustrates the participated teachers' profile.

Table 3.1

Participants' profile

Name	Gender	Qualifications	Experience
Teacher 1	Male	Bachelor's degree of Science Education	15 years
Teacher 2	Female	Bachelor's degree of Science Education	12 years
Teacher 3	Male	Bachelor's degree of Science Education	14 years

3.5 Data Collection Procedure

This research involved three science teachers at the Saudi Schools in Kuala Lumpur noting that there were only three science teachers in the sixth grade at the schools. Two methods were used for collecting this research data; interview and classroom observation. These methods are the main data collection methods for a basic qualitative research (Roller & Lavrakas, 2015). Table 3.2 illustrates the methodology followed in selecting the methods of data collection.

Table 3.2

Research questions and tools of data collection

Research Questions	**Methods of data collection**	**Purpose**
What are the Saudi teachers' perceptions on the sixth grade science curriculum?	In-depth interview (semi-structured)	To investigate the Saudi teachers' perceptionson the sixth grade science curriculum.
To what extent do the Saudi teachers' implement the sixth grade science curriculum?	Observations & Interview	To explore the extent of the Saudi teachers' implementation of the sixth grade science curriculum.

3.4.1 Semi-structured interview

Interview is a significant research data collection tool for its ability to gather in-depth information on the topic under study. It provides the interviewees a platform to freely express their opinions. In this study, interview was one main tool for collecting the research data. The interview questions were semi-structured adapted from Alshammari (2014) (see appendix A). The adaption of interview questions from Alshammari (2014) was carried because both studies tackled similar problems in a similar methodology, in addition, Alshammari (2014) interview questions were tested and validated by experts. The interview questions discussed the topics of the content of the science curriculum, the teacher's implementation of the curriculum, the teacher's view of the current curriculum, the teacher's knowledge of the tools of the current curriculum, the challenges of teaching and learning the current curriculum, and the activities of the current curriculum.

The in-depth interviews were carried with the three science teachers at the Saudi Schools in Kuala Lumpur. One-to-one interviews were carried during the times these teachers were available; i.e. when they had no classes. Each interview took an average of an hour. The interviews were recorded with the permission of the teachers. After that, the recorded interviews were verbatim transcribed. Table 3.3 is a summary of data collection information with each participant.

3.4.2 Classroom Observation

Classroom observation was a key tool in this study since it provided the researcher with the actual application of the teaching and learning process. It offered an evident site of the implementation of the current sixth grade science curriculum. The aim of using classroom observation in this study was to witness and understanding the in-site learning and teaching of the current curriculum. Certain

observational categories adapted from Alshammari (2014) (see Appendix B) were prepared to observe the teaching tools and methods and the learning activities as well as the students' interaction and involvement, the classroom suitability, facilities and size for the lessons of the current adapted science curriculum. The adaption of observational categories from Alshammari (2014) was carried because both studies tackled similar problems in a similar methodology, in addition, Alshammari (2014) observational categories were tested and validated by experts. These observational categories served as a guide to the current classroom observations.

The researcher with the arrangement of the three teachers attended two classes for each teacher. The number of observed classes was defined following the satisfactory approach. In other words, the researcher observed the classes until the results were saturated for the same teacher. Saturation is a state when the researcher cannot find new ideas or information (Creswell & Poth, 2018). Accordingly, two classes were observed for each teacher. Every classroom observation took 45 minutes (one full class). These classroom observations were carried at the science classes at the Saudi Schools in Kuala Lumpur. During the classroom observation, the researcher took notes focusing of the topic under teaching and the teachers' classroom practice as well as the students' engagement.

Moreover, the classroom observations took place during the delivery of the lessons of Chapter 7: Earth, Sun and Moon under Unit 4: Space.

Table 3.3

Summary of Data Collection

Data Collection Technique	Teacher 1	Teacher 2	Teacher 3
Semi-structured interview	Date:17 Apr 2018 Time: 1.00 pm Location: School	Date: 05 Apr2018 Time: 2.30 pm Location: School	Date: 11 Apr2018 Time: 2.30 pm Location: School
Classroom observation 1	Date: 03 Apr2018 Time: 2.30 pm Location: School	Date: 06 Apr2018 Time: 2.30 pm Location: School	Date: 09 Apr2018 Time: 10.45 am Location: School
Classroom observation 2	Date: 16 Apr2018 Time: 10.30 pm Location: School	Date: 12 Apr2018 Time: 8.45 am Location: School	Date: 17 Apr2018 Time: 1.30 pm Location: School

3.5 Data Analysis

This section discusses how the researcher analysed the data were gathered from the interviews and classroom observations. Mackey and Grass (2005) argue that usually the cyclical data analysis is employed by the researchers when analysing a qualitative data in nature. The qualitative data were gathered by means of interviews and classroom observations. In this study, Marshal and Rossman's (2006) analytical steps were chosen. The first step is organising the data; the second step is immersing in the data; the third step is generating categories and themes; the fourth step is coding the data; the fifth step is offering interpretation; the sixth step is searching alternative understanding; and the seventh step is writing the finding.

3.5.1 Organizing the Data

Organizing the data is the heart of data management as what Huberman and Miles (1994) asserted. This stage is the essential stage in a qualitative data analysis. In this study, the data consisted of : 1) Semi-structured interview ; and 2) classroom observations. The researcher organise the data manually.

The first stage in analysing the current research data was to transcribe all recorded interviews with the teachers immediately after each interview. The interviews were translated from Arabic into English by a professional certified translator (see Appendix A). For the classroom observations, the researcher listened to the audiotape recorded and compared with the field notes from the observation sessions. The researcher created a separate files for each teacher participated in this study and save all the transcripts of interview and the classroom observation sessions accordingly.

3.5.2 Themes and codes

The second stage was to code the research data then categorise them into themes based on the research objectives. This process is called thematic analysis. Thematic analysis aimed to assist structuring the research data. It provided detailed and rich information for the various aspects under study. The classification of the research data was carried manually by the researcher based on the statements provided in the teachers' interviews and classroom observations. Subject-related statements were classified into codes. Similar related codes were put together into categories. Categories of related aspects were labelled into themes. Table 3.4 explains the main categories and the main themes.

From the data of this study, the participants perceived that the sixth grade science curriculum to be informative and prescriptive in nature. In this study, the research data was classified under codes. Some of that codes were, conduct hands-on experiments, provide children with scientific concepts, information, practical skills, and background, develop thinking skills, develop problem solving skills, develop decision making skills, develop creativity, linking science to students' daily life, suitability of the curriculum to the religion of Islam, scientific experiment and

method based content and gradual concepts development, use of image and illustrations, use of scientific words within the understanding of learners, collaborative designed curriculum, teaching tools assist to acquire multiple skills, teaching tools facilitate the understanding of lessons, encourage students' interest in science, the current science curriculum encourages creativity, development of skills and use of technology, need for training, need for laboratories, and absence of required materials for experiments.

From the codes, the categories were formulated. Some of these categories were: scientific knowledge, scientific skills, students' daily life-related, religious-related, cultural-related, social-related, teaching and learning and teaching methods, teaching tools, students' assessment.

Then, themes were generated under three main headings: (A) Informative Curriculum which included: (1) Scientific knowledge & Scientific skills, (2) Students' daily life-related, and (3) Religious- related, social-related and culture-related, (B) Prescriptive Curriculum which included: (4) Teaching and learning, and teaching methods, (5) Teaching tools, and (6) Student assessment, and (C) Curriculum Implementation which included: (7) Implementation enablers and (8) Implementation inhibitors.

Table 3.4

The Main Categories and Themes

Informative	**Prescriptive**	**Curriculum Implementation**
Scientific knowledge & Scientific skills	Teaching and Learning and Teaching Methods	Enablers
Students' daily life-related	Teaching tools	Inhibitors
Religious-related, Social-related, & Cultural- related	Students' Assessment	

3.6 Trustworthiness

In the research study, the trustworthiness was confirmed through triangulation. Denzin (1978) illustrated that triangulation classified into four types: a) the triangulation of investigator, b) the triangulation of the data, c) the triangulation of the data, d) the triangulation of the methodology. This study used the triangulation of the data. The data collection techniques used in this study namely; semi-structured interview and classroom observation. The researcher used this strategy to be able to test a source of data against another source to detect any discrepancies and ignore them in interpreting the results. In this study, the sixth grade science teachers' perception and implementation of the science curriculum at a Saudi school in Kuala Lumpur, as believed and illustrated by the participants in this study, were validated by the participants as well as the classroom observation sessions.

Moreover, in this study, member checking strategy was employed. The researcher used to ask the participants to check, correct, and clarify the researcher's interpretations of their words. By using this strategy, the researcher is sure that she avoids the misunderstood and biases.

3.1.5 Research Ethics

This research was carried in accordance with the ethical practice guidelines for educational research as stated by the Ministry of Higher Education, Malaysia and the research ethics and norms of the Faculty of Education, the University of Malaya. The teachers signed a consent form for volunteering participation in this study. The permission to carry out the study at the Saudi Schools in Kuala Lumpur was granted by its principal. For ethical purposes, only interviews with the three teachers were audio recorded; however, classroom observations were not recorded due to cultural constrains.

3.3 Summary

This chapter offered a description of the current research methodology. It established the data collection procedures through the tools: semi-structured interviews with sixth grade science teachers at the Saudi Schools in Lumpur and classroom observations. It illustrated the way these techniques achieved the current research objectives. It further presented the way in which the gathered data was analysed taking into consideration the qualitative nature of the study.

CHAPTER 4

FINDINGS

4.1 Introduction

This chapter presents the results and findings of the data with regards to the research questions:

RQ1. What are the Saudi teachers' perceptions on the sixth grade science curriculum?

RQ2 To what extent do the Saudi teachers' implement the sixth grade science curriculum?.

The main purpose of the current study is to investigate the sixth grade science teachers' perception and implementation of the science curriculum at a Saudi school in Kuala Lumpur. This chapter presents a comprehensive explanation of the thematic analysis of the study. It thereafter comes up with the results and findings derived from the thematic analysis. The results were generated from the interviews and classroom observations from different respondents who were basically teaching staff from the Saudi School in Malaysia.

The analysis was conducted in stages in regard to the research questions. Statements and answers offered by the three science teachers were classified into codes. Codes were also grouped into categories. Several themes were derived from these categories. Therefore, the themes emerged from the analysis were discussed in the present chapter. This chapter organized under: perceptions on the curriculum, curriculum implementation, and teachers' overall view of the current science curriculum.

4.2 Perceptions on the curriculum

The teachers perceived the curriculum in nature to be informative, which provides information about the scientific knowledge to be taught, the scientific skills to be developed, the students' daily life activities to be related to, and the students' religious, culture and social life to be taken into consideration. And prescriptive, which provides various styles of teaching and learning and teaching methods.

4.2.1 Informative Curriculum

The teachers perceived that the sixth grade science curriculum contains information on scientific knowledge and scientific skills, students' daily life-related, religious, cultural and social-related information. Table 4.1 explains the main categories under this theme.

Table 4.1

Main Categories of Informative

Categories	Explanation
Scientific knowledge and Scientific skills	Scientific knowledge is the scientific concepts, information and background (facts) taught and explained in the content of the current sixth grade Saudi science curriculum. While scientific skills are the hands-on experiments, thinking skills, problem-solving skills, decision-making skills and creativity developed in the content of the current sixth grade Saudi science curriculum.
Students' daily life-related	Students' daily life-related are the linkage of science to students' daily life, the use of science in tackling real life challenges and searching information from various sources, topics which are discussed in the content of the current sixth grade Saudi science curriculum.
Religious-related, Cultural-related, and Social-related	Religious-related is the suitability of the content of the current sixth grade Saudi science curriculum to the religion of Islam. Cultural-related is the suitability of the content of the current sixth grade Saudi science curriculum to the culture of Saudi Arabia. While Social-related is the suitability of the content of the current sixth grade Saudi science curriculum to the society in Saudi Arabia.

4.2.1.1 Scientific knowledge and scientific skills

The teachers perceived that the objectives set for the current sixth grade science curriculum are to provide students with scientific knowledge and skills. To ensure teachers' understanding of the objectives of teaching the science curriculum to six grade students, the participants were asked to describe the objectives they hope to achieve from teaching the science curriculum. It was discovered from the interviews that the objectives are science-based. Teacher 1 believed that his objectives are based on the objectives set by the Ministry of Education to teach science and all those objectives are important for him. While Teacher 2 said:

> *there are many goals set by the Ministry of Education to teach science in the primary stage. Some of those objectives are: familiarizing children with the components of their surrounding environment in order to develop intelligent interaction, Developing scientific skills and mental abilities such as analysis, criticism, reasoning and problem solving, Creating scientific trends among children , Developing children's behavior and their health and social habits., Developing children's interest in scientific decisions, Directing children towards collaborative learning and promoting scientific leanings among them, Satisfying children's curiosity.*
>
> [Interview: Teacher 2, line46- 57]

Then she added that :

> *I think the objectives are defined by the curriculum itself rather than the teacher. However, I hope that teaching science for the primary stage will provide children/students with concepts, information, skills and trends which constitute for them a scientific background and form science education in the future. I think that the primary stage is the starting point of building scientific generations. Childhood stage is a critical stage which needs to receive educational fundamentals, hence, realization of concepts becomes more established. The application of modern methods of teaching science must be made available to students in order to prepare them for new types of jobs.*
>
> [Interview: Teacher 2, lines 59-66]

While Teacher 3 said that the objectives of the current sixth grade science curriculum focus on practical aspect and the curriculum designed based on student-centered learning approach. This assertion is read in teacher 3's answer as follows:

> The objectives of the sixth grade science curriculum *focus on the applied or practical aspects*, *help students to develop their love for the useful scientific reading build the mental abilities and scientific skills*, *achieve a comprehensive and integrated understanding of the scientific subject and focus on student-centered learning*.
>
> [Interview: Teacher 3, lines 49-60].

Teachers' statements show that developing scientific knowledge and skills are the main objectives of the sixth grade science curriculum.

Furthermore, in terms of the offered scientific knowledge and skills in the sixth grade science curriculum content from the perspectives of the three teachers, they have asked about their views on the content of the current sixth grade science curriculum. Teacher 1 voiced that:

> *The content of the science curriculum for the primary stage (grade 6) is characterized having scientific experiments and activities related to the units of study"...* and *"develop students' interest in reading scientific materials, train them to use references, encourage them to develop the style of scientific writing and give them a chance to practice hobbies and activities related to what is taught and learned from science.*
>
> [Interview: Teacher 1, lines 141-143 and 59-61]

Teacher 1's statement during the interview in regard to the scientific knowledge and skills presented in the content of the current sixth grade science curriculum is supported by the classroom observations where the notes read:

> *The teacher proceeded the lesson by explaining the basic concepts. He asked the students 'what is space and what can be found there?' When the students did not know what to say, he provided them with answers and asked them to repeat.*
>
> [Classroom Observation 1: Teacher 1]

While Teacher 2 asserted that the current sixth grade science curriculum takes into account the gradual building of concepts. She added that:

> *The curriculum takes into account the gradual building of concepts and their transition from the easy to the difficult, from the physical to the abstract, and the unusual to the familiar.*
>
> [Interview: Teacher 2, lines 158-160]

As for teacher 3, also asserted that the content of the current sixth grade science curriculum builds the scientific skills. He added that:

> *The content of the current sixth grade curriculum builds the mental abilities and scientific skills which are needed by students, such as, analysis, criticism, reasoning, problem solving and decision-making"* and "*develop the students' scientific and creative abilities and achieve a comprehensive understanding of the scientific subject*.
>
> [Interview: Teacher 3, lines 55-56 and 76-77]

This statement is supported by the observations of this teacher's classes;

> *Then the teacher showed a slide and a video related to the earth's revolving around itself and the consequences of this move. The teacher asked the students about the consequences of the earth's revolving around itself and the students answered: the occurrence of day and night.*
>
> [Classroom Observation 1: Teacher 3]

During the second observation session of teacher 3 , it was observed that the teacher began to explain the lesson and showed a picture of the different phases of the moon from the beginning to the end of the month. Then he asked the students 'why does the moon has different phases?' and they answered, 'the earth's move

around the sun' Then teacher moved to the book to highlight the basic concepts related to the lesson.

Based on the analysis, it is deduced from the teachers' class observation sessions and the interviews that the content of the current sixth grade science curriculum offers scientific information, concepts and explanations to scientific facts that are relevant to the students' level and consider individual differences. This, in turn, enriches students' scientific knowledge, develops students' creativity and thinking skills, decision-making skills, and practical science.

4.2.1.2 Students' daily life-related

Students' daily life-related is another category. The teachers perceived that the sixth grade Saudi science curriculum provides several topics that discuss students' daily life-related issues. It attempts to help students to establish and develop their knowledge and skills which in turn assist students' tackle their daily life issues.

In this regard, the teachers were asked if the content of the current curriculum helps students to solve their problems in their everyday lives. Teacher 1 believed that the content of the current curriculum helps students to solve their problems. He added that:

> *I can say that the science book for grade six considerably links students with everyday life and helps them think and solve problems.*
>
> [Interview: Teacher 1, lines 164-165]

This statement of teacher 1 is supported by the observation sessions of his classroom where the topics of the moon and earth and the natural phenomena such as day and night, four seasons and lunar calendar which is very important to the

Saudi students as other Muslims who rely on this calendar for their dates and religious events. In this regard the notes read:

> *Then the teacher showed a video about the Earth and the Sun in space. Afterwards, he asked questions about what they watched in the video and the answers were as follows: Earth, Sun, planets and space and then the teacher pointed out to the students that the title of the lesson would be about the Earth-Sun system and wrote it on the board.*
>
> [Observation 1: Teacher 1, lines 4-7].

Moreover, in regard to the reflection of the content of the current sixth grade science curriculum on the students' daily life, teacher 2 believed that the current sixth grade science curriculum helps students to solve the life problems which relevant to their life. She stated that:

> *Yet, it helps but to some extent. Problem solving is one of the methods used in teaching modern science in order to achieve the objectives of teaching science, and the strategies of its teaching and learning, it assists student to solve real life problem that relevant to the life of students as well as match with the level of their thinking.*
>
> [Interview, Teacher 2, lines 167-177]

Further, as for teacher 3 revealed that: "*linking these lessons with daily life helps students to think well and solve problems in a scientific way"* [Interview: Teacher 3, lines 150-151].

During observation sessions of the teacher 3, it was noticed that the teacher asked the students about the learning outcome from the current lesson and they answered that they would be able to identify the beginning and the end of the month especially for the month of fasting and Eid al-Fitir supports.

It can be seen under this aspect that the teachers' perception of the current sixth grade science curriculum is acutely relates and solves students' real-life issues and challenges. Thus, the current sixth grade science curriculum develops students' problem-solving skills to tackle real-life challenges..

4.2.1.3 Religious-related, social-related and cultural-related

This category discusses the suitability of the sixth grade science curriculum for the beliefs, culture and society of Saudi Arabia. Thus, the participants were asked whether the objectives of the curriculum are clear as well as suitable for the Islamic and Saudi culture and for students' society or not. All participants equally answered Yes. For teacher 1, he believed that the objectives of the current sixth grade science curriculum are clear to him. He added that: "*Yes, they are very clear to me and match with the Islamic culture and the Saudi society".* [Interview: Teacher 1, line 72].

Teacher 2 also responded with affirmative answer. She said:

> *Yes, the objectives are clear to me and they are to some extent suitable for the Islamic and Saudi culture; however, it is preferable to add emotional goals. They are also to some extent suitable for students' society, but the curriculum is packed with valuable information and sometimes they are higher than the level of the student.*
>
> [Interview: Teacher 2, lines 77-80]

When asked the same question, teacher 3 on his part stated that:

> *Yes, they are clear to me. They fit the Islamic culture and the Saudi society. Therefore, through teaching science for our new generation, there is a positive tendency based on faith in God, and its applications are encouraged to be applied according to the provisions of religion.*
>
> [Interview: Teacher 3, lines 65-67]

It is indicated from these responses that the current objectives of the science curriculum drawn by the ministry of education are very clear to the teachers and in total compliance with the Islamic principles and Saudi Arabic culture. From this, the final aspect generated stated that the science curriculum possesses clear and suitable objectives for Islam and Saudi culture. In other words, the objectives of the science curriculum were formulated by the ministry of education with clear goals in compliance with Islamic principles and Saudi culture. It was added by all participant that the science curriculum objective should primarily aim at inculcating the religious principles and values to the students. That is why the Saudi curriculum is not only aimed at developing students but also religious-focused.

Furthermore, in order to consolidate the aspect of the curriculum content, the participants were asked whether the current content suits students' culture, religion and everyday environment. In these regards, teacher 1 believed that the content of sixth grade science curriculum is appropriate in terms of the Islamic principles. He said that:

> *The lessons presented in the book are appropriate in terms of the religious Islamic principles; some topics in the book are supported by verses from the holy Qur'an and prophet's sayings*
>
> [Interview: Teacher 1, lines 174-176]

Teacher 1 added that the content of the current sixth grade science curriculum is match with Islamic culture and the Saudi society in general. When asked the same question, teacher 2 agreed with teacher 1 about the suitability of the current sixth grade science curriculum for the Islamic and Saudi culture. She added that:

> *Yes at the beginning of each unit, there are Quranic verses which link religion with learning. In addition, the general and particular objectives of teaching science enhances students'*

> *knowledge of the Creator and make them relate between scientific facts and the absolute ability of Allah Almighty*.
>
> [Interview:Teacher2, lines 223-226].

Teacher 3 also admitted that the content of the current sixth grade science curriculum is suitable. He said that:

> *Lessons are also appropriate from the religion aspect since some of them are supported by Quran verses or Hadith*.
>
> [Interview: Teacher 3, lines 159-160].

Accordingly, all participant teachers answered in affirmative as per the question raised here. It was reported by the teachers that the content of the current sixth grade science curriculum is acutely in line and suitable for students' age, environment and culture. It was equally affirmed that the current curriculum content is in compliance with the Islamic principles and entrenched in the Quran and the tradition of the Prophet (SAW). It was also observed that the topics do not challenge religious statements regarding to the scientific topics discussed in the content of the curriculum.

In summary, teachers perceive that the content of the current sixth grade science curriculum is appropriate for student's religion, culture, and society of Saudi Arabia.

All in all, it can be concluded from the entire discussion under this section that the current curriculum content is based on scientific experiment and method, that develops problem solving skills in students, tackle real life challenges and appropriate for students' culture, society, environment, and Islamic teachings.

4.2.2 Prescriptive Curriculum

The teachers perceived that the sixth grade science curriculum is a prescriptive, which prescribes thes various styles of teaching and learning and teaching methods and tools which facilitate students' assessment. This theme includes: (1) teaching and learning and teaching methods which includes collaborative learning, teaching methods, and learning styles; (2) teaching tools which includes the role of teaching tools and the importance of teaching tools; (3) students' assessment which explains the criteria that teachers follow in the assessment of their students' achievements. Table 4.2 explains the categories under this theme.

Table 4.2

Main Categories of Prescriptive

Category	Explanation
Teaching and Learning and Teaching Methods	Teaching and learning and teaching methods is the styles and methods of teaching and learning including collaborative learning (students' involvement). In other words, they are the various ways in which teachers teach and students learn in an attempt to achieving the objectives set in the curriculum.
Teaching tools	Teaching tools is the teachers' use of teaching tools, teachers' perception on the use of teaching tools and aids, and the role of teaching tools in facilitating the acquisition of multiple skills, understanding of lessons, simplifying science materials, and ensuring quick understanding of scientific knowledge.
Students' Assessment	Students' assessment is the way in which teachers assess the performance of their students. It includes continuous assessment, observational assessment and promotion of self-confidence.

4.2.2.1 Teaching and Learning and Teaching Methods

This category focuses on the styles and methods of teaching and learning. In other words, it focuses on the various ways in which teachers teach and students learn to achieve the objectives of the current sixth grade science curriculum.

Hence, the teachers were asked about their teaching styles and methods bearing in mind the individual differences and students' various learning styles. Teacher 1 believed that the current sixth grade science curriculum focuses on cooperative learning and uses multiple methods in the presentation of the scientific material. He added that:

> *The curriculum takes into account the use of images and illustrations. And the curriculum takes into account the use of words and phrases within the limits of the learning outcomes of the learner. The curriculum takes into consideration that activities are design on the basis of collective performance and cooperative learning (active learning). The curriculum uses multiple methods in the presentation of the scientific material. And the curriculum introduces enrichment activities taking into account individual differences among learners.*
>
> [Interview: Teacher 1, lines 148-150].

This statement of teacher 1 is supported by the observation sessions of his classes, He divides the students into groups using student-centred approach supporting that the curriculum encourages collaborative learning in which the notes read:

> *The teacher started the lesson by dividing the students into 6 groups of five. The students were given numbers 1-5 and the teacher confirmed their numbers again so that each student would respond when asked to participate.*
>
> [Classroom Observation 1: Teacher 1]

Moreover, teacher 2 on her part agreed with teacher 1 regarding the cooperative learning and group working. Then she argued that the current sixth grade science curriculum takes into account the gradual building of the concept. She elaborated:

> *The curriculum takes into account the gradual building of concepts and their transition from the easy to the difficult, from the physical to the abstract, and the unusual to the familiar*.
>
> [Interview: Teacher 2, lines 158-160].

The classroom observation sessions of teacher 2 confirms this statement and the teacher is employing more student-centred, adding that the students enjoy the collaborative learning encouraged by the curriculum and the teacher in which the notes read:

> *The students were divided into 5 groups of 5 students [...] The students relied on cooperative learning. They discussed the answers between themselves then the whole class shared the answers together.*
>
> [Classroom Observation 2: Teacher 2]

Further, in regard to the teaching and learning styles, teacher 3 agreed with teacher 1 and teacher 2 regarding the cooperative learning style. He said:

> *The curriculum takes into consideration the design of activities on the way of collective performance and cooperative learning based on active learning*.
>
> [Interview: Teacher 3, lines 134-135]

However, This was not evident in the both observation sessions of teacher 3. The classroom was organized in a traditional way (the desks were organized horizontally). Then the teacher showed the video and he asked the students to write their remarks on a paper.

The findings of the current study confirm that all participants teachers who teach the current sixth grade science curriculum believed that the current science curriculum focuses on cooperative learning and uses multiple methods of scientific material.

It is noticed that the three teachers' perceptions of the curriculum consider the different students' levels and uses simple language and images for this purpose. It can be said that the sixth grade Saudi science curriculum offers a range of activities that suit the students' individual abilities. It is also revealed from the classroom observations that the curriculum allows the various teaching and learning styles, yet it encourages more on the collaborative learning.

Moreover, the teaching method is the next aspect consider under teaching and learning and teaching methods. The teachers were asked about the teaching methods do teachers mostly use in the classroom. Teacher 1 believed that the choice of the teaching method for the science subject depends entirely on the topic of the lesson. He elaborated:

> *The methods which I use repeatedly: Discussion (I use it for the lessons about the Solar System), Lecturing method (I use it when there is lack of learning tools), Comparative method (I use it for the lessons about cells, plant cells, and animal cells.) and PowerPoint presentations and video.*
>
> [Interview: Teacher 1, lines 234-238]

This statement is supported by the classroom observation sessions of teacher 1 in which the prominent methods used in the class are discussion and lecturing method. This was evident from the introduction of the first classroom observation. This can be found from the extract of the observation:

> *The teacher started the lesson by dividing the students into 6 groups of five. The students were given numbers 1-5 and the teacher confirmed their numbers again so that each student would respond when asked to participate.*
>
> [Classroom Observation 1: Teacher 1].

It can be seen from the extract above that, students were divided into groups which each student is given opportunity to respond to set of preplanned questions. It means not only the teacher was making the discussion, but students were also involved. On the aspect of lecture method, it was observed from the class that:

> *The teacher started to explain the lesson using a traditional method. He asked the students, 'how can you watch the stars and the moon?' One of the students said that the stars and the moon could be seen by the naked eye. Then the teacher asked, 'Can the planets be observed by the naked eye as well?*
>
> [Classroom Observation 1: Teacher 1].

It is observed that the teacher explains the lesson using tradition method, which is known as lecture. It means, teacher explains while students listen for a long period of time.

Teacher 2 on her part, she argued that the best teaching method is what appropriate to the nature of the class and the objectives of the curriculum. Similarly to teacher 1, teacher 3 answers that he uses the method of discussion, as the teacher's statement reads:

> *Method of discussion such as in the lesson of the moon phases.*
>
> [Interview: Teacher 3, line 216].

> *The teacher used lecturing method, questioning technique and showed the other slides about the lesson. Afterwards, the teacher started the discussion with the students and corrected mistakes. The teacher clearly explained the aim of carrying out the activity. The students showed active interaction and mentioned whatever they saw in the picture.*
>
> [Classroom Observation 1: Teacher 3].

The responses from the participants indicate that the entire teachers use the conventional teaching methods which are lecturing and discussion. Meanwhile other methods claimed to be applied by the participants are either teaching aids or skills which cannot be categorized under teaching method. More so, it was asked from the teacher that why do they like the aforementioned teaching approach or methods. In this respect, teacher 1 argued that he preferred to use discussion method. He elaborated:

> *I like the method of discussion the most because it is based on the exchange of ideas between the science teacher and students to introduce the learning material, hence, it facilitates in the explanation of the lesson, its understanding, analysis, and assessment.*
>
> [Interview: Teacher1, lines 242-244].

Teacher 2 on her part, she liked to use the discussion method because she believed that this method helps her to achieve the objectives of the curriculum. She added that:

> *It also helps me achieve the objectives of teaching and learning science which focus on students' beneficial acquisition of scientific knowledge.*
>
> [Interview: Teacher 2, lines 320-321].

While teacher 3 gave almost similar response to that of teacher 1, he believed that the discussion method helps in understanding of the subject. He added that:

> *I like the method of discussion because the science teacher and students participate in the discussion of the material. This helps in interpretation, understanding, analysis, and better evaluation of the subject. An example of this method is the dialogue approach.*
>
> [Interview: Teacher 3, lines 227-229].

This means that the entire participants are unanimous on their responses to this above question. From these responses the researcher concluded that the methods used by the teacher especially the discussion method ensure class participation and objective realization. This is because discussion is based on exchange of ideas and assists teachers in achieving teaching objectives. Further, as read in the previous question, classroom observation sessions confirm these statements.

The last aspect under this category, the teachers were asked whether the current curriculum encourage science teachers to use different teaching methods in class. Teacher 1 argued that the teachers can use various methods to teach the current science curriculum. He added that:

> *The current curriculum helps the teacher use all methods of teaching in case they are available and teachers are adequately trained how to apply them.*
>
> [Interview: Teacher 1, lines 248-249].

Teacher 2 on her part argued that all teaching methods can be used for the sixth grade science curriculum. She said that:

> *All teaching methods can be used for the current curriculum as long as the appropriate classroom environment is available and teachers are professionally trained to use them.*
>
> [Interview: Teacher 2, lines 340-342].

Deductions from the classroom observations of the three teachers show the use of various teaching methods. For example, the notes of the classroom observation sessions of teacher 2 read:

> *In each group, the students wrote the information they knew on a small whiteboard and the leader of each group stood up and read the answers loudly.* The students were given some time to have a group discussion. Again, one student from each

> group was assigned to read the answers. *He then used the method of lecturing, directly explained the answers and wrote them on the board.*
>
> [Classroom Observation 1: Teacher 2].

Teacher 3 believed that the teachers of the current science curriculum can apply all suitable teaching methods if they get opportunities to develop themselves like training courses. He added that:

> *Actually, I preferred to use discussion method. However, sometimes that method is not suitable for some topic. Because of that I hope if the stakeholders offer more training courses and develop the science laps*
>
> [Interview: Teacher 3, lines 232-234].

The study found that the current sixth-grade science curriculum helps to apply various teaching methods when the ministry of education provided the necessary laboratories and provided excellent training courses for teachers in implementing the curriculum according to the objectives set for the curriculum by the Ministry of Education.

4.2.2.2 Teaching tools

This category focuses on the teachers' perception that the curriculum prescribes the use of various teaching tools and aids, the role of teachings tools in facilitating the acquisition of multiple skills, understanding of lessons, simplifying science materials, and ensuring quick understanding of scientific knowledge. The first question asked under this category is about the tools used in teaching the current science curriculum. Teacher 1 responded saying that he used some computer applications, posters, and school laboratory for teaching the current sixth grade science as prescribed in the curriculum. He added that:

> *I do my best to use educational charts or posters, realia, computer applications, school laboratory, educational videos (YouTube) and PowerPoint.*
>
> [Interview, Teacher 1, lines 202-203].

It was equally discovered from the observation sessions of the teacher 1 that the teaching tools used are the common teaching aids such as educational models, power points and educational videos. This is evident from the observation extract below:

> *Then the teacher showed a video about the Earth and the Sun in space, the teacher introduced the Learning Chart (KWL) consisting of three empty columns. After that, the teacher showed a picture for an astronomical telescope used for observing objects in the space. The teacher wrapped a box in colored paper, placed it in front of the students and told them that the box represented a planet.*
>
> [Classroom Observation 1: Teacher 1].

It is also discovered that the teacher improvised in the lesson with a real-life object by wrapping a box with a colored paper. What can be inferred from this is that there are inadequate teaching materials and tools for enhancing their lesson in the school. The two major reasons are that, if there are adequate teaching tools there will not be need for improvisation. The second one is that, the class is apparently lacking some contemporary teaching tools such as online aids tools, digital classroom, learn boost, modular object-oriented dynamic learning environment. From this, it is seen that the main challenge of teaching sciences curriculum according to the observation is inadequate of teaching tools.

Similarly, teacher 2 also prefers video and PowerPoint presentations for teaching the current sixth grade science curriculum. He said that:

> *In some cases, I use models, show educational videos and PowerPoint presentations provide natural samples and cards which I make by myself.*
>
> [Interview, Teacher 2, lines 252-253].

Equally, for teacher 2 the teaching tools used are the common teaching aids such as educational models, power points and educational videos. This is evident from the observation extract as follows:

> *The teacher distributed worksheets on the groups and equally provided small white board for each group. the teacher started to ask how we can discover the space. The students answered that they can do so by looking at the sky by the naked eye. The teacher explained that the space can be explored by using special telescopes and he showed pictures of them. He also showed a video about their application. He then moved on to talk about the topic related to the earth's revolving around itself and around the sun. He asked the students about the results of such movements of the earth, but the students did not provide correct answers. He then used the method of lecturing, directly explained the answers and wrote them on the board. He asked the students to write in their notebooks the important notes of the lesson.*
>
> [Classroom Observation 1: Teacher 2].

Classroom observation sessions of teacher 2 show that the teaching tools used are acutely similar to that of teacher 1. What can be inferred from this is that, the teachers in the Saudi schools are almost faced with the similar materials challenges. Furthermore, similarly to teachers one and two, teacher 3 responded that he is trying to use some tools. He added that:

> *Hence, I am trying all my best to use some tools such as educational boards, instructional or educational models, school's labs, PowerPoint presentations and educational videos.*
>
> [Interview: Teacher 3, lines 183-185].

Equally on the teaching tools, teacher 3 uses similar teaching tools as the rest of teachers. In this regard, the classroom observation notes read:

> *Then he showed a picture for each tool and asked the students to read the list of tools required for the activity, a slide related to the lesson's objective 'to explore the space and instruments used for it exploration'. He also showed the way of doing the activity in a video. He showed the video again and he asked the students to write their remarks on a paper.*
>
> [Classroom Observation: Teacher 3].

It was discovered from the above discussions that the tools used in the current curriculum are contemporary and technological instructional aides and real life objects, such as the use of educational videos, power points and natural samples, educational charts, real objects, technology applications, educational models, and educational videos. In furtherance of this issue of tools, the participants were asked about the availability of teaching tools in their schools. Teacher 1 asserted that the laboratory of his school is not adequately prepared to be used as required in the current sixth grade science curriculum. He added that:

> *In school we only have educational posters. The laboratory is not adequately prepared to be used as required in the course book.*
>
> [Interview, Teacher 1, lines 206-207].

Teacher 2 on her part responded that the science laboratory in the school lacks many of the facilities needed for the experiments required in the science curriculum. He added that:

> *No, Not available in the school lab. The lab is not adequately prepared. Some of the tools are damaged or unfit to use. Most of the tools are not available and if they exist, we haven't been trained to use them.*
>
> [Interview, Teacher 2, lines 256-258].

Similarly of teachers one and two, teacher 3 believed that the school's lab is not appropriate in accordance to the sixth grade science curriculum. He elaborated:

> *The things which are available include, educational boards and educational models. The school's lab is not appropriate in accordance to the curriculum (I mean the science curriculum for the sixth grade). In addition, we do not have a laboratory specialist in the school. The laboratory specialist is an essential part of the teaching process because he/she assists in the preparation of the tools, and hence, helping the teacher to save a lot of time and effort. For*

> *example, when I taught the lesson of 'magnetism', I needed an electromagnet which is not available in the school. Thus, I displayed a video about the magnet and how it works. Even if this device is available in the school, we need to be well-trained on using it to get the desired result, so that students can receive the information in a proper way.*
>
> [Interview, Teacher 3, lines 193-201].

The extracts from the classroom observation sessions are just indication that the teachers of the Saudi School have similar challenges of inadequate of the tools and do not have intensive knowledge on the usage of the contemporary teaching tools. The inadequacy of the teaching tools and instrument was evident during the observation when a student asked the teacher about the availability of the tools, but teacher responded with negative. This can be confirmed from the extract below:

> *One of the students asked the teacher if this instrument is available in the school science lab to try using it, but the teacher replied that the instrument is not available in school but he showed a picture and a video of it instead.*
>
> [Classroom Observation 1: Teacher 3].

Generally, it was concluded by the entire participants that the tools for teaching the current sixth grade science curriculum is grossly inadequate in their respective schools. This has made the researcher to conclude that the schools have inadequately furnished laboratory. This is due to the fact that the participants asserted that the science laboratory is inadequately prepared and the tools in the laboratory are not appropriate for the current science curriculum contents.

The next aspect under teaching tools the researcher further asked the respondents if they needed a teaching tool but it wasn't available in their school, could they explain what to do? Teacher1 1 responded that he uses the traditional method for teaching science curriculum if the required tool is not available in his school. He added that:

> *Well, I resort to the traditional method of using the whiteboard and marker. I also show PowerPoint presentations.*
>
> [Interview, Teacher 1, lines 217-218].

While teacher 2 on her part said that:

> *I will use educational Videos, PowerPoint Presentation, natural Samples and cards.*
>
> [Interview, Teacher 2, line 265].

Similarly to teacher 1, teacher 3 emphasized that he used the traditional method of teaching in the absence of the necessary equipment and tools to explain the current sixth grade science curriculum. He added that:

> *I would use a traditional method by using a blackboard, pen, PowerPoint presentations and videos so that students can easily understand the scientific material.*
>
> [Interview, Teacher 3, lines 198-199].

Under this category, participants were asked what to do in case there are no tools to be used to support their science teaching. The entire participants asserted that they will resolve to the conventional teaching aids as well as improvise with the real life objects. On the other hand, some said they will use the common teaching gadgets such as power points, educational videos etc. More so, the participants were asked whether the current curriculum encourage them to use teaching tools. In this regard, teacher 1 responded in affirmative when he emphasized that the current sixth grade science curriculum helps and urges the use of appropriate and multiple teaching tools. He said that:

> *Yes, because they greatly assist students to acquire multiple skills related to observation, criticism, analysis, comparison, classification and conclusion.*
>
> [Interview: Teacher 1, lines 221-222].

Teacher 2 on her part responded also in affirmative. She elaborated that:

> *Yes. And this leads to a clear understanding of the scientific material and promotes the development of basic skills for science learning such as criticism, analysis, observation and conclusion.*
>
> [Interview, Teacher 2, lines 268-270].

Similarly, to teacher 1 and teacher 2, teacher 3 responded in affirmative that the current sixth grade science curriculum encourages him to use the recent teaching tools. He added that:

> *Yes, the science curriculum for the sixth grade encourages me to use recent teaching tools such as reading images, scientific writing, models' work and linking knowledge to the real life of students.*
>
> [Interview, Teacher 3, lines 201-203].

It was deduced from the above responses that the teacher participants collectively agree that the current sixth grade science curriculum content could assist in using several teaching tools which are contemporary and novel. Equally, it was stated that these contemporary tools will assist in building students' intellectual capacity. Thus, it is deduced that the current sixth grade science curriculum will assist to promotes the usage of contemporary teaching tools and bring about multiple skills acquisition.

The next aspect under this category focuses on the impact of teaching tools on understanding the scientific subject of the curriculum on students. The teachers were asked whether the teaching tools could help students understand the science subject. Teacher 1 responded that:

> *Yes, as I mentioned earlier on the importance of teaching aids and their significant impact in simplifying the scientific material faster and better.*
>
> [Interview: Teacher 1, lines 225-256].

Teacher 2 responded in affirmative. She said that:

> *Yes, as I explained earlier they facilitate understanding the assigned material and lead to the consolidation of information. They save the time and efforts for the teacher and students.*
>
> [Interview: Teacher 2, lines 275-276].

Similarly, teacher 3, He believed that the using of teaching tools helps students to understand the scientific material. He said that:

> *Yes, in a faster way and it achieves a full understanding of the scientific material.*
>
> [Interview: Teacher 3, line 206].

It is therefore seen from the above assertions that the contemporary teaching tools facilitate understanding of scientific material by simplifying scientific material, facilitating understanding and consolidating information and ensuring quick understanding of scientific materials. Finally, it can be found from this discussion, the used teaching tools for the current sixth grade science curriculum are scarcely available at Saudi schools, but the tools are suitable in promoting multiple skills acquisition and facilitate understanding of scientific material. Nevertheless, due to the absence of modern scientific tools and laboratory in the school, the classroom observations could not confirm or deny the teachers' statements on the role of teaching tools encouraged by the curriculum in facilitating the understanding of science for students.

4.2.2.3 Student Assessment

Student assessment is the last category under prescriptive. It is one of the most fundamental aspects of the teaching and learning process. The teachers assess their students based on what is presented in the curriculum. The first aspect under this category focuses on method of students' assessment that teachers use to

assess their students' academic achievement. The teachers were asked about how they assess their students. Teacher 1 responded that:

> *My students in sixth grade are assessed by Continuous Assessment Method.*
>
> [Interview: Teacher 1, line 258].

Teacher 2 on her part responded saying that she is implementing the continuous assessment method. She elaborated that:

> *We assess science learning outcomes among students by implement continuous assessment method according to a list of assessment items identified by a groups of evaluations specialists in the ministry of education.*
>
> [Interview: Teacher 2, lines 353-355].

Similarly, to teacher 1 and teacher 2, teacher 3 asserted that he used continuous assessment method which is consider as a common method for primary level. He said that:

> *I assess my students (the sixth grade) through a continuous assessment method which is a common used system for the primary level. Each lesson has its specific skills set by the Ministry of Education and students are accordingly evaluated on their basis.*
>
> [Interview: Teacher 3, lines 239-241].

This leads to the next question the teachers were prompted with during the interview that asked the teachers to elaborate and explain how they use the continuous assessment method. Teacher 1 elaborated his answer saying that:

> *Continuous assessment is based on assessing students' acquired knowledge. It is applied right after the completion of each lesson which has a set of skills accredited by the Ministry of Education to evaluated students accordingly. There is also observation method and evaluating students' worksheets, learning chart (KWL), portfolios and written tests (short essay and objective tests)*
>
> [Interview: Teacher 1, lines 261-265].

Teacher 2 elaborated her answer in the previous question saying that:

> *I also written tests conducted at the end of every unit of the study. The tests do not aim to assess students' capability of memorizing information rather, it includes a variety of questions which measure acquired skills. For this, there are essay and subjective (fill in the blanks, true or false, match, multiple choice, put in the correct order, etc)*
>
> [Interview: Teacher 2, lines 355-359].

As for teacher 3, he explained in details saying that:

> *Continuous assessment include assessment of students after completion of each lesson. Each lesson has its own skills that are accredited by the Ministry of Education and teachers assess students based on them. In addition to the way of observing, evaluating the work of students, worksheets, learning tables and short tests which has the form of essay tests.*
>
> [Interview: Teacher 3, lines 243-246].

These findings are confirmed by the classroom observation sessions. In which the notes read:

> *The teacher distributed worksheets for each student. The sheet contained direct questions to assess students' acquired knowledge. The students had to complete blanks with correct answers and state if the given statements were true or false. After doing the worksheet, the teacher checked the answers with the class, corrected mistakes and provided further explanations.*
>
> [Classroom Observation 1: Teacher 1].

> *The teacher asked the students to fill in the KWL Chart based on what they have learned in the lesson because he wanted to use it for the continuous assessment of the student.*
>
> [Classroom Observation 2: Teacher 1].

Moreover, teacher 3 confirmed this finding by the first classroom observation session in which the notes read:

> *The teacher distributed small cards between the students. each student had to answer a question in the card and return it to the teacher to check it and record the student's continuous assessment. The teacher showed back the slide related to the KWL chart and students were asked to write their correct answers on the board. *The teacher used observation for the continuous assessment.*
>
> [Classroom Observation 1: Teacher 3].

The major form of assessment according to the participant teachers is the continuous assessment method as well as observational method, which they perceived to be suitable for students at the elementary level as well as suitable for the current science curriculum. In the same vein, the participants were asked how they can use this assessment to achieve curriculum objectives. Teacher 1 responded that:

> *Continuous assessment is characterized by continuity and it does not allow the teacher to fragment any assessment item because this doesn't measure a student's character and learning potential. The assessment has a holistic view and promotes the student's self-confidence, assigns him a responsibility and makes him more positive.*
>
> [Interview: Teacher 1, lines 268-271].

Teacher 2 answered the interview question saying that:

> *It is a kind of comprehensive evaluation taking into account promoting students' self-confidence and enhancing their sense of resistibility.*
>
> [Interview, Teacher 2, lines 357-358].

While teacher 3 believed that:

> *Continuous assessment is characterized with continuity and it does not allow segmentation of one skill that weakens its mastery. Continuous assessment also does not separate the*

> *personality of students and their abilities, but rather it inclusively views learners in a way they achieve a sense of confidence in themselves and bear some of responsibility, this makes them more positive.*
>
> [Interview, Teacher 3, lines 248-252].

The responses of the three participants mentioned the similar thing in different words. Stating that, the kind of evaluation they used for the students which are continuous and observation assessment promote student's self-confidence. This is because the assessment is not spontaneous and not frequent that could create occasional fear of test and examination on students. It equally inculcates the strength of self confidence in them because if they did not do well in the first exam or test they will have the sense of hope of making it up in the next examination. Therefore, this will create sense of confidence in them since they will also have the opportunity to make up for their past failures. Summarily under this category, it can be concluded that, continuous and observational assessment methods are effective in promoting students' self-confidence.

4.3 Curriculum Implementation

Curriculum implementation refers to how lessons, instructions, and assessments provided in the curriculum are delivered by teachers. The teachers' in-classroom implementation was noted during the classroom observations. Some notes were mentioned earlier under the categories of the themes informative and prescriptive. In this section, the enablers and inhibitors of the current sixth grade science curriculum implementation are discussed.

4.3.1 Enablers

The findings of this study have identified several factors which enable the required and successful implementation of the current sixth grade science curriculum. Table 4.3 explains the enabling factors.

Table 4.3

Enabling factors

Enabling factors	Description
Time	Curriculum implementation is a complex process that required adequate time for planning and delivering the content of the curriculum to students during the time set for implementing the curriculum.
Professional support	The support for science teachers within school is important for effective curriculum implementation. Such support could be in the form of providing the requirements and tools.
Professional knowledge	Teachers' knowledge and understanding of the current sixth grade science curriculum.

The first aspect under this category is adequate time for delivering the content to students. During observation sessions, it was observed that all three teachers deliver their lessons to their students in adequate time without facing workload which means that the current sixth grade science curriculum is well suited to the allotted time. The next aspect under this category is professional support. The teachers were asked about how the school administration support them in implementing the current sixth grade science curriculum. Teacher 1 stated that the school administration made great efforts to overcome difficulties for all teachers. He added that:

> *The school administration is making great efforts to overcome difficulties for all teachers, including science teachers, by providing the needs of laboratories, arranging scientific trips for students, participating in*

> *scientific exhibitions and participating in scientific competitions.*
>
> [Interview: Teacher 1, lines 302-305].

Teacher 2 on her part stated that:

> *The school administration is making great efforts to overcome difficulties for all teachers, including science teachers, by providing the needs of laboratories and school laboratories*
>
> [Interview: Teacher 2, lines 396-398].

While teacher 3 responded that the school administration makes a great efforts to help all teachers to overcome the difficulties, however the ministry of education should do more. He elaborated that:

> *The school administration makes a great effort to help all teachers, specifically science teachers, overcome difficulties by providing the needs of school laboratories, providing scientific trips for students, participating in scientific exhibitions and participating in scientific competitions. However, the Ministry of Education should have the great effort or responsibility to provide devices, tools, new technologies and training programs, since most of the training programs in schools are general and non-specialized in teaching science*
>
> [Interview: Teacher 3, lines 296-301].

The findings seemed to indicate that the teachers' asserted that the school administration makes great efforts to overcome difficulties according to the available capabilities, and that the Ministry of Education should fulfil its roles by overcoming all obstacles facing teachers to implement the current sixth grade science curriculum. The final aspect under this category is professional knowledge which means teachers' knowledge and understanding of the current sixth grade science curriculum. Based

on this, the participants were asked about their overall views on the current science curriculum. Teacher 1 stated that:

> *Through this curriculum, students can learn concepts and intellectual skills related to modern trends. They will gain manual skills as a result of being involved in laboratory work.*
>
> [Interview: Teacher 1, lines 309-311]

He added that :

> *The current science curriculum helps students to discover scientific facts. It is the process of organizing the information which students already have and establish relations between these facts in a way they have never learned before.*
>
> [Interview: Teacher 1, lines 316-318].

What indicates the teachers' knowledge and understanding of the curriculum, teacher 2 described what the curriculum contains. She elaborated that:

> *The curriculum is characterized by integrating a variety of science-based subjects (biology, chemistry & physics). It includes numerous experiments and activities related to the units of study which develop scientific trends and skills among children by motivating their thinking and promoting problem solving skill.*
>
> [Interview: Teacher 2, lines 394-397]

She added that:

> *the various materials and activities in the book develop scientific trends among children, encourage them to solve problems and explore new concepts related to real life.*
>
> [Interview: Teacher 2, lines 404-405].

While teacher 3 asserted that:

> *The current science curriculum helps on exploration which is a process of organizing an individual's stored information in a way he/she can see new relationships that had never known before.*
>
> [Interview: Teacher 3, lines 307-309].

It was deduced from the findings that the teachers well understand how the current science curriculum improves students' capacity for better functioning, in the sense that, all teachers understand what their students would learn including intellectual and manual skills, thinking, and problem-solving skills.

The last aspect under this category the participants were asked whether the current science curriculum needs to be revised or not. The entire participants responded with 'No' as follows:

> *No, I do not think so. The current curriculum contains modern and distinctive methods that benefit students, helps them to understand the scientific material, build new concepts and builds their mental capacities as long as they are guided how to apply them adequately.*
>
> [Interview, Teacher 1, lines 322-324].

> *No because this curriculum helps in building a positive generation capable of solving problems and the problems of their country.*
>
> [Interview: Teacher 2, lines 408-409].

> *I do not think so because it is a new and distinctive curriculum that benefits the student.*
>
> [Interview, Teacher 3, lines 313-314].

The responses from the entire participants were emphatic "NO" when they were asked about the need to revise the current curriculum. It shows that the current curriculum is suitable for this modern century. That is why it is concluded that all three teachers believed that the current curriculum is novel and compatible with current societal needs. This means that teachers have sufficient understanding and professional knowledge regarding the current sixth grade science curriculum. It can be generally concluded that the current science curriculum is novel and compatible with current societal needs, develop discovery and exploratory skills for students as well as improve students' capacity for a better future.

4.3.2 Inhibitors

The findings of this study have identified several factors which considered as challenges of teaching and implementing the current sixth grade science curriculum. This category is focused on the challenges which the teachers are facing while teaching and implementing the current science curriculum. Due to this, the participants were asked about the obstacles they face in teaching the current science curriculum. Teachers' answers are as follows:

> *There is a real problem in the way of teaching science in our schools. The problem is that we do not get trained to implement the curriculum in the right way. Other obstacles include large class sizes and lack of training courses which adequately create qualified science teachers.*
>
> [Interview: Teacher 1, lines 289-290].

It was evident during class observation sessions that there are some obstacles include large number of the students in this teacher's class and lack of training courses, as earlier stated. One of the effects of the lack of training courses provided

to teachers, the classroom observation sessions of teacher 1 shows that he could not offer the students accurate description of the telescope. The note reads:

> *Another student asked the teacher about the description of this telescope but the teacher's description was inaccurate.*
>
> [Classroom Observation 1: Teacher 1].

Furthermore, what confirms the need for teachers to get the training courses what is seen in the observation sessions of teacher 1's classes suggest that his implementation of the curriculum is in a way that prevented the students from answering a simple question about space which he then answered using the method of lecturing. The notes read:

> *The teacher proceeded the lesson by explaining the basic concepts. He asked the students 'what is space and what can be found there?' When the students did not know what to say, he provided them with answers and asked them to repeat.*
>
> [Classroom Observation 1: Teacher 1].

Teacher 2 on her part believed that there are some obstacles she faces in teaching the current sixth grade science curriculum including lack of teaching aids, and laboratory tools. She added that:

> *Lack of teaching aids, laboratory tools, and laboratory record. Another obstacle is the tight schedules for teachers, number of curricula assigned to the teacher, the intensity of scientific material and parents rejection to modern teaching methods*.
>
> [Interview: Teacher 2, lines 383-384].

It was evident during the classroom observation sessions of teacher 2 that the lack of teaching aids is one of the obstacles she faces in teaching the current sixth grade science curriculum. The observation sessions of teacher 2's classes suggest that the teacher implements the curriculum in a lecturing method leaving students with no interaction which hoped to increase the students' scientific interest and knowledge. This confirms the importance of training courses that teachers must obtain to implement the curriculum as planned. In this regard, the notes read:

> *The teacher began to explain the actual lesson and the main question was why the moon has different phases? The students did not answer the question. At that time, the teacher asked the same question but in a different way; 'what happens as a result of the moon's revolving around the earth and the sun?' but still no student answered the question.*
>
> [Classroom Observation 2: Teacher 2].

Moreover, there are some obstacles teacher 3 faces in teaching the current sixth grade science curriculum. He elaborated his answer saying that:

> *With regard to the obstacles related to educational techniques, the main problems faced by teachers are: Lack of a guidebook that can help teacher to benefit from the resources of the environment in the production of alternative educational techniques, lack of programs and courses needed to train the teacher on how to deal with educational techniques, lack of adequate educational techniques, unavailability of continuous maintenance for the educational techniques and unavailability of a special place for the usage of educational techniques at school*
>
> [Interview: Teacher 3, lines 278-282].

Furthermore, It was enquired from the participants whether they have attended any training programmes or workshops about the current science curriculum either personally sponsored or sponsored by the school. The entire participants responded negatively that they have not attended any training program or workshop about the current science curriculum. For example, teachers' answers are read as follows:

> *I have not received any training course on the science curriculum.*
>
> [Interview: Teacher 1, line 272].

> *In fact, I did not receive any training program during the period of my work as a teacher.*
>
> [Interview: Teacher 2, line 366].

> *I have not received any training course on the new science curriculum.*
>
> [Interview, Teacher 3, line 250].

Generally, it was discovered from the entire discussion under this category that, there are diverse pedagogical obstacles facing the teachers' implementation of the current science curriculum of which the Saudi school management are making several efforts and assist teachers in overcoming these obstacles by providing several science enhancement materials and programs.

It is therefore indicated from the above discussions that, the entire Saudi schools' teachers have not received any special training, program or workshop concerning the current science curriculum. However, they added that, they are being guided by the previous knowledge they received from previous training they attended, their university education and personal efforts such as surfing internet and reading books. In this regard, it is seen that the teachers are being guided by the previous knowledge to teach the current science curriculum. The question that

follows could not be applied because it asked them to describe the impact of the courses they have received on the current curriculum. This is because the entire participants claimed they have not received any training nor attended any workshop on the current science curriculum. However, one of them postulated that the training on the usage of the current curriculum could develop student's learning ability. Therefore, it was enquired from them whether they will need any more training with regard to the current science curriculum of which they responded in affirmative that they will need intensive training on the current science curriculum

It shows from the above responses from the teachers that there are several and diverse pedagogical challenges that the science teachers are facing with respect to the implementation of the current science curriculum. Some of the examples of these challenges as highlighted by the teachers are as follows: lack of training for implementation and large class size; lack of appropriate tools and teaching skills and lack of teaching equipment and parent rejection of modern methods.

4.4 Conclusion

This chapter discussed the analysis of the study. The first part of this chapter provided the description of the teachers' perceptions on the curriculum while the second part of this chapter provided the finding of the enablers and inhibitors of the implementation of current sixth grade science curriculum. Conclusively, the major deductions from interviews and class observation sessions of the three teachers state that the major teaching methods employed by the sixth grade science teachers in Saudi school are discussion and lecture methods. Equally, the teaching tools common among the three teachers after considering the class observation sessions revealed that the teaching tools used in the sciences classes are the common teaching aids such as educational models, power points and educational videos.

Finally, it shows from the teachers responses that there are several pedagogical challenges science teachers are facing with respect to the implementation of the current science curriculum. Some of the examples of these challenges as highlighted by the teachers are as follows: lack of training for implementation and large class size; lack of appropriate tools and teaching skills and lack of teaching equipment and parent rejection of modern methods.

CHAPTER 5

SUMMARY, DISCUSSIONS AND IMPLICATIONS

5.1 Introduction

This chapter presents the summary of the problem statement, methodology, and it presents the key findings from the analysis of both classroom observation sessions and interviews. Then, the conclusion and the findings were discussed with respect to the previous studies. Furthermore, the research implications are also discussed with respect to theoretical framework in this study. Finally, this chapter is discussed the implications of this study and several recommendations are also discussed, which focused on the recommendations for the Saudi educational institution as well as recommendations for further studies.

5.2 Summary of the Study

This study aimed to examine the sixth grade science teachers' perception and implementation of the science curriculum at a Saudi school in Kuala Lumpur. This study attempted to tackle the research problem suggested by the literature in which teachers' voice are not heard when preparing a new curriculum which in turn raises issues in curriculum implementation. Teachers' perceptions of the curriculum are the most important factors inhibiting science learning in the Saudi schools (Madani & Forawi, 2019). According to Alruwais, Abdulhamid and Alshalhoub (2011), the current science curriculum has been designed to develop the creativity and abilities of students so that they can gain comprehensive understandings of the scientific materials, develop concepts, solve problems, and communicate and use technology. However, the literature showed that many teachers still adopt traditional teaching methods such as lecturing which is a strategy that makes students passive learners (Al-Shammari, 2015). Therefore, there is a wide gap between the objectives of the

recent curriculum development projects and what is implemented in real teaching settings (Al-Shammari, 2015). This research tackled the problem of the absence of science teachers' perceptions in curriculum reforms and teachers' professional development projects set by the Saudi government in its attempts to enhance science education in Saudi Arabia. This absence of teachers' perceptions, as discussed earlier, led to a limited success in achieving the government's goals due to teachers' implementations and classroom practices that are not in line with the science education expectations set in the curriculum. This study also comes to bridge the gap in literature on the perceptions of sixth grade Saudi science teachers. The study therefore aimed to examine the perceptions of the sixth grade science teachers at the Saudi Schools in Kuala Lumpur on the current curriculum. It also investigates the degree of their implementation of the curriculum. Further, this study attempted to identify the factors that facilitate and that inhibit the implementation of the curriculum.

Accordingly, the study attempted to answer the following questions:

1. What are the Saudi teachers' perceptions on the sixth grade science curriculum?
2. To what extent do the Saudi teachers' implement the sixth grade science curriculum?

In order to achieve the research objectives and find answers to the research question, this study adopted a qualitative approach in which Vygotsky (1978) and Mezirow (1991) transformative learning theory are its theoretical framework. In this study, learning is continuous and experience-based. The research data was collected from semi-structured interviews and supported by classroom observation sessions of three sixth grade science teachers at the Saudi Schools in Kuala Lumpur.

This study found that the current sixth grade science curriculum is perceived to be informative which provides information about the scientific knowledge to be taught, the scientific skills to be developed, the students' daily life activities to be related to, and the students' religious, culture and social life to be taken into consideration. The science curriculum also perceived that the teaching and learning should be students-centered. In addition, the findings of this study have identified several factors which enable the required and successful implementation of the current sixth grade science curriculum including the adequate time for delivering the content to students, the school administration makes great efforts to overcome difficulties according to the available capabilities, and that the Ministry of Education should fulfil its roles by overcoming all obstacles facing teachers to implement the current sixth grade science curriculum, and the teachers well understand how the current science curriculum improves students' capacity for better functioning. Finally, The study found that there are some factors that inhibit the implementation of the current curriculum. Among these factors were lack of training for implementation, large class size, lack of appropriate tools and teaching skills, lack of teaching equipment and parent rejection of modern methods. There were also teachers who lack adequate knowledge about the current science curriculum.

5.3 Discussion

It can be seen from above that there are five main findings. This section attempts to further discuss these findings and relate them to previous studies.

5.3.1 Curriculum as Informative Document

The teachers perceived that the sixth grade science curriculum contains information on scientific knowledge and scientific skills, students' daily life-related, religious, cultural and social-related information. The study found that the content of

the current sixth grade science curriculum offers scientific information, concepts and explanations to scientific facts that are relevant to the students' level and consider individual differences. This, in turn, enriches students' scientific knowledge, develops students' creativity and thinking skills, decision-making skills, and practical science. This is in line with the findings of O'Neill (2015) who claimed that curriculum should bring about outcomes such as the knowledge, skills and abilities in students and develop new skills to a high level. In addition, the Scottish government proposed that its recent curriculum to gain the knowledge and skills for learning, skills for life and skills for work that they need as well as provide more opportunities to develop skills for learning, skills for life and skills for work for all young people at every stage (Scottish, 2008). It was also suggested that exciting and stimulating curriculum should promote the development of students' knowledge, understanding and skills as part of the wider school curriculum (Department for Education-England, 2014). Equally, several studies have establish and justify the importance of the inclusion of technology in primary education (Al-Faleh, 2012; AlSharidah, 2017; Alshumaim & Alhassan, 2010). This due to the fact that, exploration compound word of which experiment is part of it. Meaning that, experimentation is part of exploration. It is a situation whereby learners are encouraged to examine and investigate new material with the purpose of discovering relationships between existing background knowledge and unfamiliar content and concepts (Barufaldi, 2009). This is exactly the meaning of experimentation, whereas the only difference is that, experiment mostly takes place in a laboratory setting while exploration takes any form of searching for new ideas.

Moreover, the finding also points to the fact that the current science curriculum seeks to solve real life human problems. It is also worth noting that this study also supports what Al-Faleh (2012) reported that any quality curriculum tackle real life challenges and solve practical problems. An argument also shared by Schwartz (2007).

The findings of the present study affirmed that the objectives of the current sixth grade science curriculum were formulated by the ministry of education with clear goals in compliance with the Islamic principles and Saudi culture, which also were not only aimed at developing students' skills but also religious-focused. This has already been pointed out by the Department for Education-England (2014), that the curriculum objective must contribute to the culture, of the nation. It further asserted that high-quality design and technology education makes an essential contribution to the creativity, culture, wealth and well-being of the nation. This has established the fact that the design of the curriculum objectives must be in consonance of the popular local culture. Even Islam itself is related to the science to the extent that the knowledge on the relation between the Quran and science is well disseminated to the Muslim in the world (Arip Kasmo et al., 2015). At present, there are many books written on the topic of the relation between the Quran and science (Tawfik, 2008; Awadalla, 2004; Naqvi, 2012). Equally, there are more than 750 verses of the Quran which describe the universe and the nature of the universes as well as the field of embryology, in which the Quran in many verses talk about (Arip Kasmo et al., 2015). According to Yaacob and Embong (2008), have identified the need for an integrated curriculum in Islamic educational system. Therefore, it is a fact that Islamic schools either public or private are obliged to implement curriculum that is integrated and strive to realize the aim of Islamic education. From the

discussions it is seen that, this finding is in consonance with the previous empirical studies.

5.3.2 Curriculum as Prescriptive Document

The teachers perceived that the sixth grade science curriculum is a prescriptive, which provides various styles of teaching and learning and teaching methods and tools which facilitate students' assessment. This theme includes: (1) teaching and learning and teaching methods which includes collaborative learning, teaching methods, learning styles, and student-centered; (2) teaching tools which includes the role of teaching tools and the importance of teaching tools; (3) students' assessment which explains the criteria that teachers follow in the assessment of their students' achievements.

In these regards, this study found that all participants who teach the current sixth grade science curriculum believed that the current sixth grade science curriculum focuses on cooperative learning and uses multiple methods such as lecture and discussion methods of scientific material. This means that the curriculum can accommodate both the conventional teaching methods as well as the modern and recently developed methods. However, it should be noted that lecture method has its own advantages despite that it is old and widely criticize. For instance Kaur (2011) highlighted the benefits of lecture method that it is efficient, planning time is devoted to organizing the context of which less attention has to be devoted to teaching strategy. Kaur (2011) added that, it is flexible and can be adapted to a wide range of subjects, most people can learn to lecture well enough to survive in a classroom, and it is easier to learn than most other instructional strategies. And finally, it is easier for teacher due to simply telling students about the subject. Due to this reasons lecture method is still relevant until the present modern age. Discussion method, on the other

hand, in consonance to the above finding discussion method is suitable and imperative for developing students' intellectual arts of thinking and communication as well as useful in teaching technique for developing higher-order thinking skills which enable students to interpret, analyze, and manipulate information (Al-Faleh, 1992; Larson, 2000). The evidences from other empirical studies supported and justified the findings of the present study.

The current study also found that the curriculum perceives teaching tools to be used for the current curriculum; however, they are scarcely available at the Saudi schools, although the tools are suitable in promoting multiple skills acquisition and facilitate understanding of scientific material. This implies two points: firstly, the tools which are suitable for the current science curriculum are inadequate in the Saudi schools. This is seen as one of the major challenges of science education not only in Saudi Arabia but also other developing countries across the world. For instance several studies have found that ICT tools were not available only in the Saudi schools but also in the developing countries across the world (Al-Faleh, 2012; AlSharidah, 2017; Alshumaim & Alhassan, 2010). The second point from this finding is that the tool is suitable in promoting multiple skills acquisition and facilitate understanding of scientific material. One of the relatively recent tools integrated in teaching is ICT of which several studies have discovered that it assists students in understanding science subjects and enhances several skills acquisitions (Al-Faleh, 2012; AlSharidah, 2017; Alshumaim & Alhassan, 2010).

The findings also suggest that the curriculum perceives continuous and observational assessment methods and these assessment methods are effective in promoting students' self-confidence. It was discovered from the findings that the common assessment methods that the teachers in the Saudi school use are both

continuous and observational assessment methods. Based on the continuous and observational assessment method it would be inferred that the assessment method would improve students' self-confidence. It is also worth noting that this study also supports what Alausa (1996) reported that continuous assessment is an approach which involves the use of a variety of assessment instruments, assessing various components of learning, not only the thinking processes but including behaviors, personality traits and manual dexterity. It is also reported by the research as being guidance oriented because it involves data gathering over a period of time, it will yield more accurate data reaching the teachers early enough to modify instruction. This could play a vital role in diagnosing and remediating areas of learners' weaknesses (Alausa, 1996). The findings of this study also supports what Muskin (2017) argued that the progress of learners is assessed would have time to correct the problems. Because this provides feedback to the students on their area of strengths and weakness. Equally, it allows educators to explore more deeply students' abilities to apply academic lessons, including performing tasks based on the students' local context and which can involve 'hands-on' elements and extend over time (Muskin, 2017). Also, an argument also shared by Nadia (2013) reveals that tests are the most strategies used by teachers to assess students' performance and their progress. It should be noted that the major aim of continuous assessment is to provide feedback in order to ensure academic and personal development. It is believed that, when feedback is provided to students it tends to improve their performances of which if the performances are increased, the self-confidence will be improved with it. The study also found that the observation assessment method is also a form of continuous assessment. It is one of the informal assessment methods in young children's education. This method is useful for the current sixth grade science curriculum. The

findings of this study also supports what Turupcu (1999) reported that the observation is the only way to assess the learner's ability in certain areas such as interviewing style, history taking, technique and organization of physical exam. Even it was discovered that, it provides better representation and stronger consequences for desirable learning outcomes (Maxwell & Queensland School Curriculum Council., 2001). The major motive of the observational assessment is the same as continuous assessment. Therefore, the argument for the latter is also stands for it.

5.3.3 The implementation of the Curriculum

Curriculum implementation refers to how lessons, instructions, and assessments provided in the curriculum are delivered by teachers. In this section, the enablers and inhibitors of the current sixth grade science curriculum implementation are discussed. The findings of this study have identified several factors which enable the required and successful implementation of the current sixth grade science curriculum. This study found that the current sixth grade science curriculum is well suited to the allotted time for delivering the content to students without facing workload. This is in line with what Seehron (2012) reported that it is important to provide massive investment in time to implement the current curriculum. Moreover, the findings of Fitgerlad (2009) and Wise & Bennett (2003) reveal that teachers and the managers in education departments face workload pressures during implement new curriculum. However, this study found that all teachers deliver their lessons to their students in adequate time which means that they don't face workload pressures during implement the current science curriculum. This study also found that the school administration makes great efforts to overcome difficulties according to the available capabilities, and that the Ministry of Education should fulfil its roles by overcoming all obstacles facing teachers to implement the current sixth grade

science curriculum. This is in line with what Howe and Bell (1998) reported that the best implementation of the new curriculum needs more and intensive support from schools' principals. However, the findings of this study have identified several factors which considered as challenges of teaching and implementing the current sixth grade science curriculum. It is discovered from the finding that lecture and exploratory methods are the major means of teaching in the current curriculum content. Lecture method on one hand, is common method, which is not very compatible with the current science curriculum. It is used because it is one of the easiest method in teaching and better for immediate recall lesson (Al-faleh, 1992). Lectures are easier to learn than most other instructional strategies and they are flexible and can be adapted to a wide range of subjects (Kaur, 2011). That is why it used for teaching related subjects. Meanwhile, exploratory method is one of the popular methods for teacher science. This is because, as students explore and investigate, they are making cognitive connections and stretching their minds to make sense of what they are observing (Perrault, 2009). It is equally used to facilitate the learning and mastery of a predefined and relatively the field of study (Lelouche, 2005). In this sense, it has been empirically justified that lecture method and exploratory method are suitable for teaching the current science curriculum.

Moreover, it was discovered from the study that there are diverse pedagogical difficulties facing the teachers' implementation of the current science curriculum of which the Saudi school management are making several efforts to assist teachers in overcoming these obstacles by providing several science enhancement materials and programs. Most of the practical examples of the challenges are as lack of training for implementation and large classroom size, lack of appropriate tools and teaching skills, lack of teaching equipment and partial parent rejection of modern methods.

5.4 Contributions and Implications of the Study

There are several contributions and implications drawn from the present study. These implications are seen as the major contributions of the study. Practically, the findings of this study shed light on the sixth grade science teachers' perceptions and implementation of the science curriculum at a Saudi school in Kuala Lumpur. With such findings, the ministry of Education in Saudi Arabia can get better knowledge and understanding of how the sixth grade science teachers' implement the current science curriculum. It shows from the findings that there are several pedagogical challenges science teachers are facing with respect to the implementation of the current science curriculum. Some of the examples of these challenges as highlighted by the teachers are as follows: lack of training for implementation and large class size; lack of appropriate tools and teaching skills and lack of teaching equipment and parent rejection of modern methods. In addition to the practical implications, the study also made practical implications in the sense that educators and educational administrators can notice from the findings of this study which indicating that there are a strong relationship between teaching practices and other several factors which enable the successful implementation of the current sixth grade science curriculum. On the other hand, there are several factors which considered as challenges of teaching and implementing the current sixth grade science curriculum.

The current study also suggest that teachers need in-service training as well as continuous development which keeps the learning process as discussed by the Transformative Learning Theory. Moreover, schools should have all necessary equipment and facilities needed for explaining science. It is also made to know in the present study that the education objective is in line with the Islamic principles and the Saudi culture. This implies that Quran and Hadith are very relevant to the

sciences subjects. It is discovered that several verses from the glorious Quran and the prophetic tradition can be used to teach sciences. For instances, reproductive system can be taught solely with the Quran and Hadith as well as water cycle, even the aspect of mountains and rocks can be adequately taught. It is now expected from the Saudi teachers to include the Quranic teaching in the body of sciences. More so, it is seen that exploratory teaching method is best suited for the present curriculum content.

Therefore, educational stakeholders most especially teachers and the ministry of education should strive to make explorative and experimental method as the major method of teaching sciences of which students could explore and discover new knowledge themselves which will go a long way in developing their thinking and creative skills. In the same vein, it is also discovered that teaching science subjects without direct and practical application in the society is baseless. This due to the fact that society relevance is one of the major focuses of the present curriculum. Therefore, it will be very imperative for teachers to always link their science topics with real life experiences so that students can learn the practical application of what is being taught in the class. It is also seen that the contemporary teaching tools in the Saudi school are inadequate while teachers are equally not grounded in the usage of the tools. Efforts should be made by the government in the regard to provide the teaching aids and tools relevant to the current curriculum to the school. Teachers should also receive in-service training on how to use the tools in order to keep them abreast of the current challenges of the education. Teacher should inculcate the spirit of lifelong learning due to the fact that the world most especially in the field of education keep on evolving and new things, methods, tools are always being

discovered and developed. This will prevent them from being outdated and enable them to the ever relevant to the educational setting.

As for the theoretical contributions, the theory adopted by this study was transformative learning theory. While this theory proposes what the views and implications of the Saudi teachers on the current sixth grade science curriculum including the content, teaching activities, instructional tools and methods of student assessment. These aspects are the essential parts of any learning process. Teachers' perceptions were the result of the premises that contained only two elements; the socio-cultural, and the epistemic. The premises generated the meaning perspectives that represented one's predisposition and assumption. Meaning perspectives in turn generated meaning schemes that involved exploring the teaching beliefs, attitudes, feelings and judgment. These measurements integrated in the meaning schemes that shaped the interpretation of the teachers' perspectives and guided their actions. The transformative learning theory construct informs the present study and vice versa. This is because, what the views and implications of the Saudi teachers on the current sixth grade science curriculum including the content, teaching activities, instructional tools and methods of student assessment, helps to understand how the teachers' implement the sixth grade science curriculum and the extent of achieving the main objectives of the current sixth grade science curriculum set by the Ministry of Education.

5.5 Recommendation for Further Studies

Due to the scope of the present research and the importance of its subject matter, it will be advisable that another study should be conducted using different methodology such as quantitative research of the same subject so that it could be generalized across the Saudi Schools.

Another research could be conducted in the same area but used an inclusive participant. It means that, similar study will be conducted with the same methodology but should have different stream of participants among the education stakeholders such as teachers, school principals, education administrators, and curriculum planners. It is equally recommended that similar and comprehensive study should be conducted in Saudi Arabia of which the outcome will be submitted to the Saudi Arabia Ministry of Education for implementation.

5.6 Conclusion

This study has uncovered the Saudi teachers' perceptions on the sixth grade science curriculum. It has established that the Saudi teacher has constructive perception on the current Saudi science curriculum and they are keen to learn and implement the current science curriculum for grade six. In addition, it has explored the extent of the Saudi teachers' implementation of the sixth grade science curriculum. In this regard, the teachers have applied the current science curriculum to the grade six students to the best of their ability. They commonly use discussion and exploratory methods to teach the grade six students the content of the science curriculum. The study equally discovered that the major inhibitors to the effective implementation of the current sciences curriculum are lack of adequate knowledge of the current teaching tools on the part of teachers as well as inadequately furnished laboratory. Therefore, the government is advised to provide the appropriate teaching tools and training for grade six science teachers. On the aspect of teachers, they should be prepared to engage in lifelong learning. So that everybody will contribute to the development of education and the nation at large.

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