The influence of the physical environment on learning behaviour:

a case study of intermediate schools in Kuwait

Mohammad A A H M Ali

PhD

2017

BIRMINGHAM CITY UNIVERSITY

Faculty of the Arts, Design and Media (ADM)

The influence of the physical environment on learning behaviour:

a case study of Intermediate schools in Kuwait

By

Mohammad A A H M Ali

Doctor of Philosophy, PhD

March 2017

A thesis submitted in partial fulfilment of the degree of Doctor of Philosophy

BIRMINGHAM CITY UNIVERSITY

Faculty of the Arts, Design and Media (ADM)

The Parkside Building, Birmingham, B4 7BD

Abstract

A school's physical environment plays a vital role in enhancing learning and teaching experiences. Currently, there is a growing body of literature indicating the critical impacts a school's physical environment can effect on students and teachers. However, far too little attention has been paid to this issue, not excluding public schools in Kuwait.

This research investigates the impact of the physical environment on learning and teaching behaviour, performance and outcomes in Kuwaiti intermediate public schools. It evaluates the quality of architectural characteristics of school buildings, and the classroom interior features in term of spatial, visual, acoustic, thermal and personal environmental aspects.

A mixed methods approach was adopted to efficiently assess the quality of learning environments. The documented case studies consist of comprehensive figures consolidated from five public schools by three methods. A physical survey was designed to assess the condition of school buildings and classroom environments. The observation helped to measure the influence interior classroom environments exerted on students' and teachers' performance and behaviour. Concomitantly, a school inventory survey (questionnaires) were also designed to represent the students', teachers' and school administrators' concerns and feedback regarding their school environment. In addition, a qualitative semi-structured interview was conducted with a Ministry of Education official, who generously provided further insight into the case studies' results.

Comparative analysis findings from this study indicate several contributions to the current literature. Firstly, results revealed that the effective quality of the learning environment identified a positive impact on learning and teaching performance and behaviour. Secondly, the results identified many inadequacies and weaknesses within the architectural system adopted in Kuwaiti schools. Thirdly, this study revealed that the lack of a proper protocol within the Ministry of Education in Kuwait imposed a negative influence on school design quality. The study concludes with a description of more specific outcomes pertinent to the quality of physical features, as well as recommendations for further studies towards improving the school learning environment in Kuwait.

Acknowledgments

Table of Contents

5   **The development of the learning system and the learning environment in Kuwait**

6   **Case studies and interview**

List of Figures

XI

List of Tables

Chapter One
Introduction to the study

The design of the research

Background study:

Identifying the gap in the existing knowledge to validate the research proposal

Aim and objectives:

To develop a better understanding of the interrelation of physical environment and learning performance

Identification of important physical elements/factors which have important bearing on learning environment

Exploring socio-spatial organisation of learning environment

Examining feature that characterises the learning environment

Assessing the mechanism of integration of all socio-physical factors in learning environment

Conduct a Pilot Studies in random schools in Kuwait to obtain an initial data and check the methods

Literature review:

Promoting the approach of the study and developing a conceptual framework for the research

Research concept

Research questions

Research strategy

Empirical work:

Establishing criteria for the case study

Tracing the physical and environmental characteristics of selected schools

Examine the students' performance and motivation in each school

Comparative analysis of the collected data from the case study

Conclusion:

Responding to the research questions by summarising the findings and suggesting the research implications for practice and research

1   Introduction to the study

1.1 Concept

> *This research explores the environment in which children spend a large part of their formative years, where they gain knowledge, play and engage with others - an environment where they experience success and failure, and yet is somewhere where they can experience wonderful moments that will stay with them throughout their lives.*

The verb 'educate' (Middle English, from Latin *educatus*) gives us the nominalised word 'education', the process of receiving or giving instruction and the means to give someone intellectual information on a particular subject. Education is both the process of *teaching* and *learning* (*Compact Oxford English Dictionary*).

'Teaching' is defined in Merriam-Webster Online Dictionary as a process or activity aimed at enlightenment and an experience that educates learners *(Webster, 2006)*: to encourage and prepare learners for their lives and understand the world. In contrast, 'learning' is a process in which behaviour changes in the student as a result of experience or 'teaching', and could occur through the ongoing acquisition of knowledge, or through a formal, directed, educative process *(Smith, 2003b)*. Thus, the *quality* of a learning system depends on the quality of teaching *(Barber and Mourshed, 2007a)*. Enhancing the quality of learning and teaching is significant in improving education.

The term 'environment' refers to the surroundings and conditions in which we live; each aspect of it has a different effect on human behaviour, productivity and perception. The main purpose of a 'learning environment' is to support and enhance the physical aspects of human understanding, such as visual, auditory and kinetic elements *(Kopec, 2006)*. The learning environment influences human behaviour through both the physical and social factors *(Higgins et al., 2005)*. Consequently, the circumstances of the learning environment and its associated physical features can have a significant influence on students' behaviour and attitudes.

The function of the learning environment is important on a student's development during schooling *(Rutter, 1979)*. An increasing body of literature indicates that there is a strong positive relationships between the environment and learning outcomes *(Cotterill, 2013)*. However, literature on the subject reveals few studies that are focused on the physical environment; little attention has been paid by the educators, interior designers and architects as to what constitutes an effective learning environment. *Allen and Hessick (2011)* stated that "*the research found in our literature review spans several decades, but still applies to the classroom today*"*(Allen and Hessick, 2011 ,p.4)*

These studies confirm that the quality of the physical leaning environment affect the students' and teachers' perceptions, behaviour, and outcomes. The physical aspects of the learning environment have both direct and indirect influences on learning and teaching performance. They impact on the potential to inspire desirable behaviour or alternatively can also contribute to students' misbehaviour *(Kopec, 2006;Wannarka and Ruhl, 2008)*. Improving the quality of the physical environment within the school design is one of the key issues that harnesses the influence of the learning environment in developing and enhancing the education system *(Frith, 2011)*.

1.2 Statement of the Problem:

The Kuwaiti Ministry of Education developed an educational strategy for the period 2005-2025 targeted to improve the educational system. The main focus of the strategy is "*Enhancing the basic requirements for school curricula in general education system to ensure the achievement of the objectives and principles of the state*" *(M.O.E, 2008)*. The

strategy is mostly concerned with modifying and developing the pedagogy system and curriculum, paying less attention to the teaching techniques and the learning environment as important factors contributing to students' learning and staff productivity *(Ali, 2010).*

The education system in Kuwait currently faces many problems. Improving educational quality was ranked the third priority for Kuwait citizens following a survey conducted by the Kuwait national assembly *(Studies and Research Sector, 2013).* A global competitiveness report (2016-2017) by *Schwab (2016)* ; assessed groups of organisations, policies, and factors to evaluate the level of productivity and prosperity, included the quality of education in 138 countries. This report shows although Kuwait was high ranking economically, it had the lowest ranking for the quality of primary public education[1], particularly in mathematics and science. Other studies revealed that the Ministry of Education in Kuwait lacks sufficient educational facilities, strategies, and a future vision *(Al-Rashidi et al. , 2012).*

Recent studies that influence the circumstances of the physical learning environment in Kuwait were influenced by the education systems used in western society. These studies also suggest the need for further research into specific elements within the learning environment *(Rutter, 1979; Allen and Hessick, 2011).* In Kuwait, there is a lack of awareness and information about this subject. Architectural and interior-design-based research in Kuwaiti education is limited. Little attention has been paid in recent years about the effects of the teaching quality on student's academic achievements *(Al-Enezi, 2002; Alghannam, 2003),* and no clear attention been paid to the impact and effectiveness of the learning environment on educational success.

There is a connection between teaching and learning which is not described in most of the recent studies. An effective learning environment significantly improves and enhances the learning outcomes *(Lee and Cho, 2013)* and creates more conducive circumstances for students to learn *(Lippman, 2010b).* The present research aims enhance the literature about education, learning and the environment in Kuwait, by examining the influence of the physical environment on learning and performance, as well as evaluating the quality of the building environment of the Kuwaiti schools.

---

1 'public' school in the UK is also refer 'state' school that funded and operated by the government

1.3 Aims and objectives

The proposed research aims to address the aforementioned gap in Kuwaiti public schools; by investigating the relationship between the qualities of the physical school environment in relation to creating learning and teaching. This study considers how the learning experience, attitudes, interaction and behaviour can be enhanced through the development of an appropriate learning environment. The broad definition of a 'learning environment' includes architectural characteristics and organisational planning as well as teaching practice and the study focusses on the quality of interior classroom spaces in terms of size, colour, lighting, seating arrangements, noise and temperature.

The aims, therefore, are as follows:

- To explore the correlation between the *physical learning environment* and the learning and teaching outcomes.
- To identify educational factors and theories that influence the behaviour and productivity within the learning environment.
- To review the education system in public schools in Kuwait, focusing on the influence of the teaching system and physical environment on learning experience.
- To undertake a series of discussions with the educational authorities, educators and teachers to explore their views and experiences in the physical environment on learning outcomes.
- To classify the main issues and obstacles within the education system and particularly the contemporary physical learning environment in Kuwait.

1.4 Research methodology

The research methodology adapted for this research is based on the exploratory nature of a 'mixed methodological approach' (see Section 4.2) that pursues a better understanding of the research objectives. The theoretical background of the educational philosophy and the learning environment is reviewed, followed by evaluating the quality of the setting in relation

to the theoretical context of the research. The research provides important insights and includes evidence from a Kuwaiti Ministry of Education official to strengthen the findings. This study provides an evidence that can help advance knowledge and understand the reasons for the difficulties in Kuwaiti educational schemes.

1.5 Scope of the study

This research is based on a previous study undertaken at Masters level by the author entitled *"How can classroom design support and lead students to want to learn and study in Kuwait's public intermediate schools?" (Ali, 2010).* Three years' teaching experience gained in intermediate public schools in Kuwait made the author aware of the influence that the learning environment has on students' performance and outcomes. Further reading on the relationships between students' productivity, performance, behaviour and the learning environment were critically important *(Earthman and Lemasters, 1996).* There is a growing body of literature that recognises the link between the physical environment and students' learning outcomes *(Veltri et al. , 2006; Tinto, 1997; Berris and Miller, 2011).* There is little published data that correlates the learning *environment* with learning *outcomes* in Kuwait *(Ali, 2014).*

The research helps to fill the gap by exploring the relationship between the physical environment and its impact on learning and teaching outcomes. This will facilitate better understanding between educators and those responsible for designing the physical learning space in schools, highlighting the linkages between the nature of the learning environment and pedagogy systems *(Frith, 2011).*

Being sympathetic to the cultural limitations for male access to girls' schools, the study was undertaken at boys' intermediate public schools in Kuwait. The public education have many conflicts in terms of the quality in a variety of disciplines including the learning environment.

Addressing the theory of the learning environment in Kuwaiti public education is, in itself, in its infancy. The first steps will clarify the benefits of a conducive learning environment on learning, student performance and teaching outcomes. The research findings could help

improve the communications between the officials, educators, and designers to produce a strategy for further research projects. The research recommendations could improve the overall educational standards in Kuwait.

1.6 Research key questions

Bearing in mind that there has been little attention paid in Kuwait to the relationship between the physical learning environment, experience and outcomes, so the current study is the first attempt in this respect centring on the following questions:

1. What is the overall quality of the physical learning environment in Kuwait's intermediate public (state) schools?
2. Who is responsible for the current quality of the learning environment in Kuwaiti public schools?
3. Do the influences of the physical learning environment change based on the school's location and socio-cultural variations?
4. To what extent does the quality of the classroom environment affect learning experience in Kuwaiti public schools?
5. How does the classroom environment affect the student and teacher's interaction and movement within the classroom?

These research questions are drawn from the researcher's own experience and further defined through theoretical reviews and scholarly interest. Thus, the researcher' hope is that through this study to find solutions addressing the problems.

1.7 The structure of the research
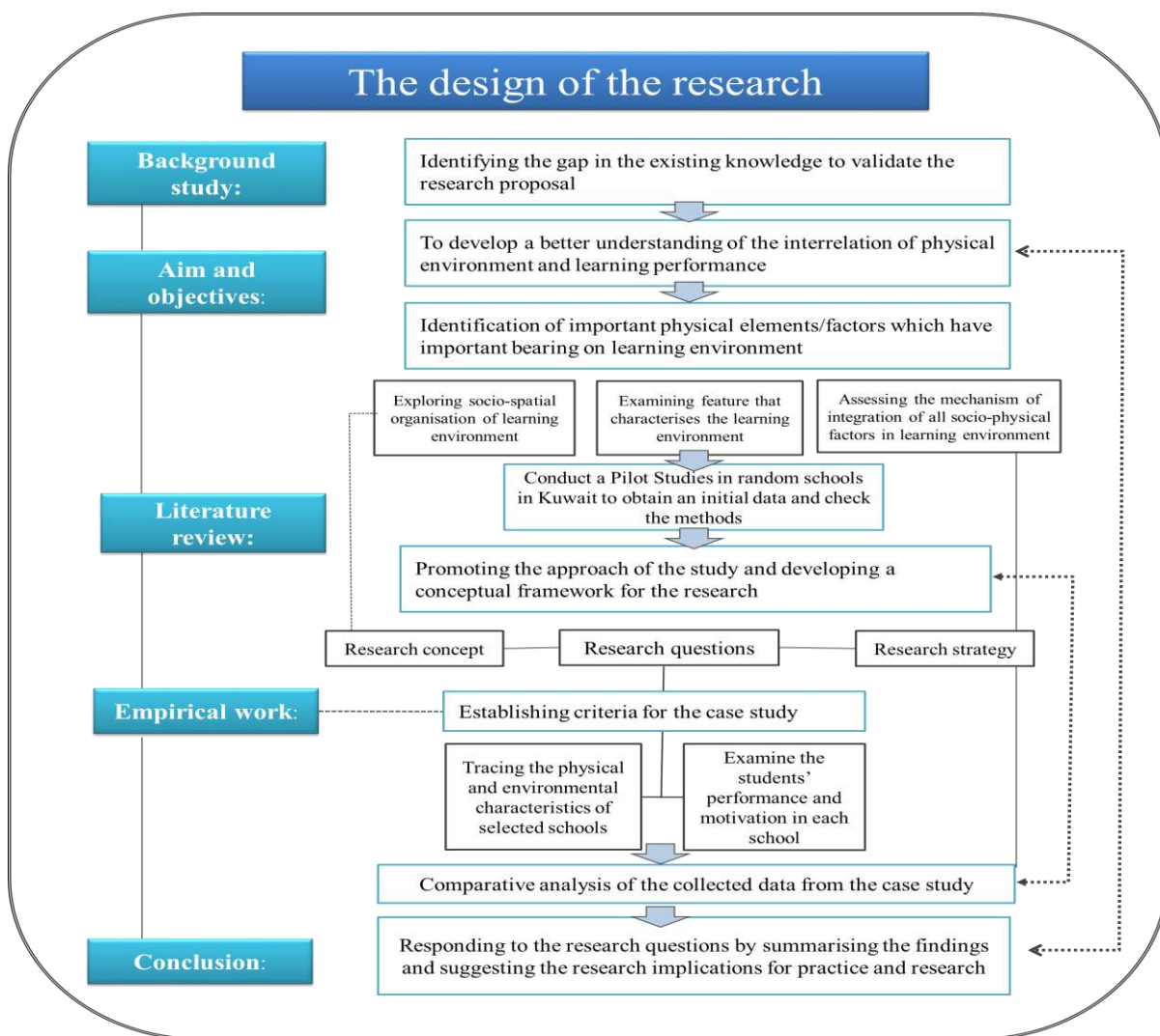
Figure 1. The research structure

The research framework is shown in Figure 1 to illustrate the research context. The foundation of the research aims and objectives being investigated are described in **Chapter one**. The literature review introduces the conceptual and theoretical background of the research and is divided into two chapters: **Chapter two** discusses the philosophy of education and outlines the relationships between educational theory and the learning environment. **Chapter three** is divided in to four sections: 1) the theory of the learning environment; 2) the impacts of the learning environment; 3) the evaluation of the learning environment; and 4) in-depth analysis of the evidence-based research about the physical learning environment.

Chapter four illustrates the research methodology used in this research, outlining the social philosophy and paradigms. It also acknowledges the research design process, the data required, and samples. The last section of that chapter demonstrates the methods used to obtain the data required, and the data collection procedures and the analysis approach that was undertaken. **Chapter five** reviews the history of educational development in Kuwait to introduce the context of the research, covering the historical development of education with specific reference to architectural perspectives, and the design of the learning environment from 18th century to the present day.

Chapter six contains the results and discussion of the research methods used in this research: the pilot study, the main case studies (i.e. survey) and an interview.

Chapters seven and **eight** summarise the findings of the research. The case studies are analysed to understand the broad perspectives and the influence of the learning environment on learning and teaching outcomes. An in-depth analysis of the classroom circumstances, and users' views and concerns, are addressed. The analysis of the interview from the perspective of officials regarding the learning environment is discussed.

Chapter nine is the conclusion of the research, outlining the principal and specific outcomes responding to the research questions. This is followed by the recommendations for future studies aimed at developing the learning environment.

Chapter Two

The Philosophy of Education

The design of the research

Background study:

Identifying the gap in the existing knowledge to validate the research proposal

Aim and objectives:

To develop a better understanding of the interrelation of physical environment and learning performance

Identification of important physical elements/factors which have important bearing on learning environment

Exploring socio-spatial organisation of learning environment

Examining feature that characterises the learning environment

Assessing the mechanism of integration of all socio-physical factors in learning environment

Conduct a Pilot Studies in random schools in Kuwait to obtain an initial data and check the methods

Literature review:

Promoting the approach of the study and developing a conceptual framework for the research

Research concept   Research questions   Research strategy

Empirical work:

Establishing criteria for the case study

Tracing the physical and environmental characteristics of selected schools

Examine the students' performance and motivation in each school

Comparative analysis of the collected data from the case study

Conclusion:

Responding to the research questions by summarising the findings and suggesting the research implications for practice and research

2 The philosophy of education

2.1 Introduction

Clarifying both the philosophy of education and the understanding of the learning environment is crucial for the present research. Educational philosophy is discussed in this chapter; the theory of the learning environment is described in Chapter three.

This chapter outlines the key ideas about the philosophy of education and the historical development of education that includes the ideologies and theories, particularly with regard to their influences on the learning environment. The literature review demonstrates the variety of styles that education is based on today, and the systems which illustrate the needs of the stakeholders who are responsible for learning quality, and how the physical learning environment has to be arranged to suit those needs.

To introduce the concept of 'education philosophy', the Cambridge Advanced Learners' Dictionary *(Walter, 2008),* defines 'philosophy' by stating:

> "The use of reason in understanding such things as the nature of the real world and existence, the use and limits of knowledge, and the principles of moral judgment."

> "Group of theories and ideas related to the understanding of a particular subject."

> "A particular system of beliefs, values, and principles."

> "The way that someone thinks about life and deals with it."

The fundamental meaning of the philosophy of education has been described by *Bailey et al. (2010)* as involving the use of logical reasoning, depending on the understanding of three main elements: knowledge, moral judgments, and the nature of reality. They then refine this into areas to develop a method that will facilitate understanding of awareness, truth, and beliefs. This process means that theories can be understood more deeply and logically. Concepts can then be carefully analysed and argued. *Woods and Barrow (2006)* argue that

teaching and learning could not occur within the philosophy of education ideology in itself, but can be created, applied or made by practice, experience and perception. This process involves many skills, including reading, writing and talking; these skills enhance the learners' ability to understand and recognise the meanings of things.

The philosophy of education is seen as a mode of thinking, being or acting; these modes might change depending on the circumstances of the educational syste*m (Arthur and Peterson, 2013). John Dewey (1859-1952),* the American philosopher, proposed a definition of the philosophy of education as follows:

> *"Philosophy of education" is not an external application of ready-made ideas to a system of practice having a radically different origin and purpose: it is only an explicit formulation of the problems of the formation of right mental and moral habitudes in respect to the difficulties of contemporary social life. The most penetrating definition of philosophy which can be given is, then, that it is the theory of education in its most general phases." (Dewey, 1916, p.386)*

2.2 Educational philosophy

There are a wide range of issues and contexts inherent in the philosophy of education. Identifying the philosophical issues for the present research is important to give a sense of the richness of the field of study and enhances the understanding of the topic. These issues mentioned by *Arthur and Peterson (2013)* are as follows:

1- The nature, aims and value (the 'philosophy') of education,
2- The development of learners and their intelligence, ethical and moral education: the objectives,
3- Knowledge of, and aspects affecting, the curriculum,
4- The social and political aspects of education which include the learning environment, education practices and education reform; this is crucial for this research,
5- Communication, inter-subjectivity and the role of language,
6- The philosophical underpinnings of the research methodology.

Gingell and Winch (2002) identify three main criteria framing the philosophy of education compared to *Arthur and Peterson (2013)*, with no direct reference to the learning environment. They refer to the criteria as first, education in its fullest sense, which implies

underlying value; second, education involves many sub-cognitive perspectives connected to a core of knowledge and understanding which surpasses mere skill, and finally, the process of education itself refers to the understanding of what is being learnt. All of which refers to points two (objectives) and six (methods) above.

Knight (2008) and *Fraser (2001)* claimed that the philosopher's approach is to emphasise the three fundamental strands of education, and that each student has to become proficient in reading, writing and arithmetic, whether they are taught at home or at state or fee-paying-schools. Education also involves character and moral development, which enables the students to function well socially, emotionally, spiritually and mentally. Therefore, the philosophy of education is concerned with all that is said about education, and cannot exclude the main conceptual objectives for education: teaching, learning, knowledge and experience *(Moore, 2010).*

Collectively, these studies outline a critical role within the philosophy of education regarding the learning environment. The impact of the learning environment and what the educational philosophy is trying to achieve could be equal. This review aims to highlight the philosophical vision of education to provide important insights to the learning environment theory.

2.3 Definition of education

The Oxford English Dictionary indicates that the term 'education' is the nominalised form of the verb 'educate', the process of receiving or giving systematic instruction, such as intellectual information on a particular subject. Thus, education is the process of teaching and learning, which includes the theory and practice of teaching itself *(Soanes, 2002).* Furthermore, 'education' has broad applications as a term and can be used in conjunction with various sectors of knowledge, referring to personal education, school education, home education and skills education *(Caro, 2008).*

The *sociological* perspective of education involves the actions that promote an individual's ability to adopt the customs of a society, or altering the nature of their interaction with culture and community. Also it encompasses the process that people follow to improve themselves or their community by developing their skills, knowledge, experiences, and attitude *(Matheson*

and Grosvenor, 1999). However, as *Carr (2005)* and *Arthur and Peterson (2013)* argue, the concept of education is sometimes contested, since different socio-cultural groups build their own distinctive perception of it, thus creating opposing standpoints between philosophers and educationalists, as some educational endeavours are less rationally defensible than others. *Peters (2003)* describes education as involving the linking of ideas in such a way that learners gain a wider understanding of the surrounding world through the use of different approaches that support their capabilities, without 'brainwashing' or coercing them.

In contrast, the *educational* perspective as described in the literature sees education as gaining knowledge: identifying how to do the things, understanding the reality of things, and attaining new ideas and skills, which are the chief purpose of education. Therefore, these classifications of education lead to learning that can cause a behavioural changes as a result of experience, and can occur through the continuous acquisition of knowledge, or as formalised learning *(Smith, 2003b).*

Thus, the purpose of education is to inspire learning processes through providing educational curricula to students via educational authorities, which depends on a variety of factors, including the philosophical foundation of education *(Peters, 2003;Bailey et al. , 2010),* as well as the history of education, and the way that educational ideologies and approaches have been developed. The characteristics of environment is not excluded in this review, due to the educational system is required a suitable environment to be applied effectively.

2.4 The History of education

A review of the history of education needs to embrace a combination of elements, especially the pedagogy and teaching systems; although these were not always classified and addressed clearly as major foundations of education. Classical education was dominated by ideologies, which could now be classified as educational principles. The ancient educational systems of Greek, Japanese and Chinese civilisations were grounded on a verbal structure and observation to deliver information and impart knowledge, and communication was generally limited to what was shared between learners and their instructor. These education systems were facilitated by families and communities who had the necessary knowledge and abilities to teach. Education was not provided for each individual equally, as it depended on the

civilization or community that the pupil belonged to, and was also affected by the quality of knowledge and contemporary science, which varied widely depending on the region *(Hailmann, 1874; More and Hughes, 1997).*

After the revolution in science, knowledge, and especially writing, the literature in the Middle Ages (5th to 15th century), and the renaissance that followed, education became more commonplace. This 'revolution' became apparent through different strategies, philosophies and systems, depending on the awareness, consideration, capabilities and priorities of each culture. Each generation attempted to draw on their own religious, cultural and literary traditions, and their own understanding of science. Consequently, the development of education was dependent on the cognitive excellence and ability within the particular culture, as well as the techniques used to offer their prioritised knowledge and beliefs to new generations *(Compayré and Payne, 2003).*

The relationships between people's thinking and their culture and traditions affected their learning style and educational reform *(More and Hughes, 1997).* For instance, Islamic education encompasses the subjects with which Muslims are most concerned, such as Arabic language, the Quran, metaphysics, literature, maths and religious studies; these studies were delivered informally in Masjids or in teachers' houses *(Ahmed and Donnan, 1994).* During the Middle Ages in Europe, education was also provided and funded mainly by the Church, which focused on the teaching of language, politics, and medicine *(Robinson, 2011).* The learning environment was organised to suit that vision which had no proper attention at that time.

However, educational opportunities were not open to the whole community; only a selected number of people were educated, due to limited family finances in a society were education was not freely provided by the state, the lack of teachers and the need to work to earn a living from a relatively young age. Children were often required to work to support their family's finances. The educational subjects were also limited; language, science, maths, and medicine were the most common subjects taught *(More and Hughes, 1997).*

2.5 The growth of education

Education systems followed different approaches across the world from ancient civilization to the Middle Ages (5th to 15th century). Several teaching/learning strategies and methods were developed and evolved to contemporary formal education. Although educational theories and visions were not always clear in that period, educational theories did exist before the nineteenth century *(Carr, 2006)*. Each society expressed its own vision and strategy in forming and improving its education system. This has been recognised as an important factor in the literature.

The development of education followed two main paths: the *theoretical vision* and the *practical vision (Robinson, 2011).* The theoretical education vision (the knowledge base) encompasses imparting information on a variety of subjects. While the practical education vision (skills based training) focuses on teaching the skills and techniques needed for work. However, *Gingell and Winch (2002)* claim that the distinction between education and training theory has been misunderstood. It is important to note that both the theoretical and practical education visions needs appropriate learning settings and arrangements.

In reviewing the literature about the history and philosophy of education, it is clear that philosophers face a crucial obstacle in identifying the connections between doctrines and philosophical systems, since each hypothesis or theory could be criticised and examined as an individual principle *(Ward, 2011)*. Educational principles are more complex because they have a variety of interconnections that need to be evaluated *(Grene, 1966)*. Consequently, the growth of education follows the efforts of philosophers who have investigated, created and reformed previous knowledge and hypotheses relevant to their society within different disciplines. Moreover, *Moore (2010)* stated in the introduction of his book entitled 'Philosophy of Education' that:

> *"These overall types of educational theory are often met with in the writings of those who for other reasons are known as philosophers. Plato, for instance, gives a general theory of education in the dialogue known as The Republic, in which his aim is to recommend a certain type of man as worthy to be the ruler of a distinctive type of society. Rousseau gives a general theory of education in Emile. Others are given in Frobel's The Education of Man, in James Mill's 'Essay on Education', and Dewey's Democracy and Education. In each case the theory involves a set of prescriptions addressed to those engaged in the practice*

of education, and in most cases, if not in all, the theory is meant to serve an external end, to prescribe a political, social or religious way of life. General theories of education are very often influential essays in propaganda." (Moore, 2010, p.4-5)

Peters (1966), emphasises in his book 'Ethics and Education' that 'education' as a word has normative implications that something meaningful will be achieved, creating a contrast between the terms 'knowledgeable' and 'educated'. In addition, *Peters (1966)* also sees educated people as following through a systematic strategy introduced by cognitive action. It is necessary to link cognition to other capabilities of the mind *(Gingell and Winch, 2002).* These require transformation of the educational beliefs into ideologies that the learning environment could supports the philosopher's principles in education achievements.

2.6 Educational ideologies

The ideologies of education are the collections of ideas, beliefs, and reflections held by people regarding educational theory and schooling. These ideologies are influenced and affected by culture, learning traditions and customs *(Meighan et al. , 2007).* Although there have been notable attempts to integrate two or more alternative educational ideologies to benefit from each of them, many obstacles exist. Educational ideologies have been classified as either *theoretical* or *empirical;* these classifications vary in approach, including the type of learning environment *(Meighan et al. , 2007).* The main dichotomies as shown in Figure 2 are:

- Teacher-centred v Child-centred
- Open-teaching v Closed-teaching
- Meaning-receiving v Meaning-making
- Authoritarian v Democratic
- Traditional v Progressive
- Transmission v Interpretation
- Open schools v Closed schools
- Dependent study v Autonomous study

Dichotomous Approach of educational Ideologies

Transmission	V	Interpretation
Teacher-centred	V	Child-centred
Open-teaching	V	Closed-teaching
Meaning-receiving	V	Meaning-making
Authoritarian	V	Democratic
Traditional	V	Progressive
Open schools	V	Closed schools
Dependent study	V	Autonomous study
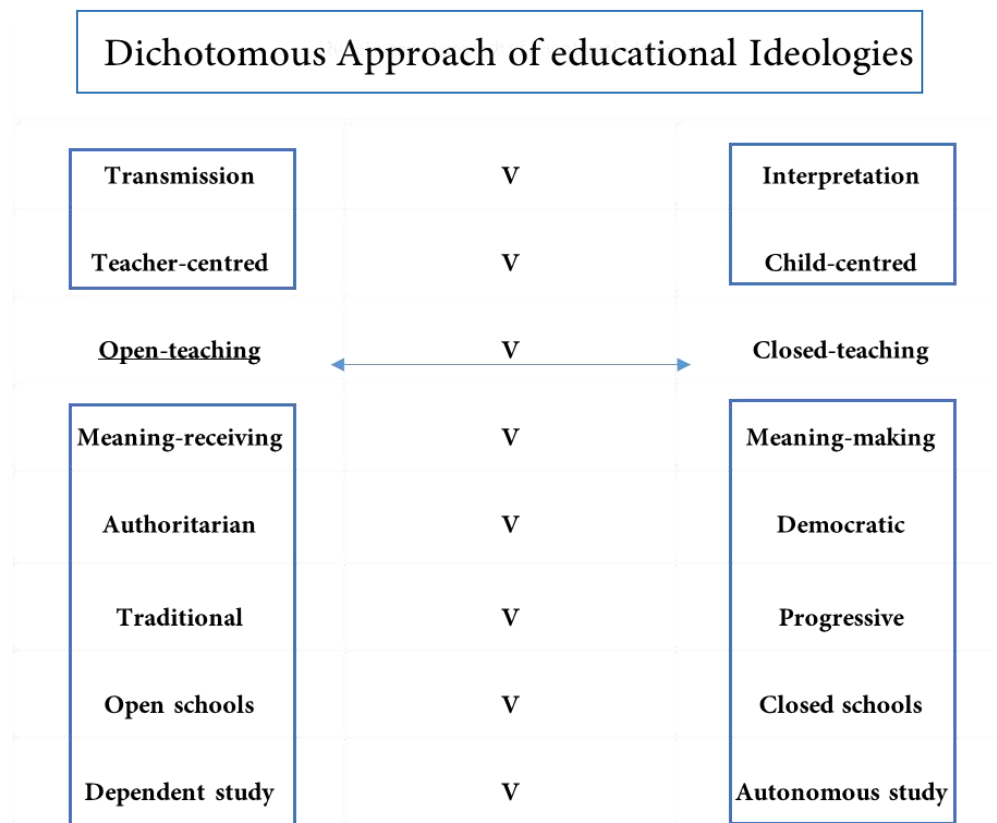
Figure 2. Dichotomous approaches, adapted from (Meighan *et al*., 2007, p. 191- 198)

Figure 2 demonstrates the two common ideologies of education: transmission and interpretation *(Barnes and Shemilt, 1974)*. The *transmission* approach emphasises giving instructions and teaching quality, which treats learners as *receivers* of knowledge only, and performance depends on the criteria applied by teachers. This approach is mirrored in the Kuwaiti teaching system. In contrast, the *interpretation* approach is dependent on the learners' efforts and capabilities in building their knowledge. The support that is given to the learners is on developing their personal skills, communicating and discussing with peers, which enhances their learning motivation and performance. Table 1 illustrates the differences between the transmission and interpretation approaches, especially with regard to teachers' concerns.

Table 1. Comparison between transmission and interpretation teaching (Barnes and Shemilt, 1974, p. 223)

The Transmission teacher	The Interpretation teacher
o Believes knowledge exists in the form of public disciplines which include content and criteria of performance.	o Believes knowledge to exist in the knower's ability to organise thought and action.
o Values the learners' performances in so far as they conform to the criteria of the discipline.	o Values the learners' commitment to interpreting reality, so that criteria arise as much from the learner as from the teacher.
o Perceives the teacher's task to be the evaluation and correction of the learner's performance, according to criteria of which he is the guardian.	o Perceives the teacher's task to be the setting up of a dialogue in which the learner can reshape his knowledge through interaction with others.
o Perceives the learner as an uninformed acolyte for whom access to knowledge will be difficult since he must qualify himself through tests of appropriate performance.	o Perceives the learner as already possessing systematic and relevant knowledge, and the means of reshaping that knowledge.

Raynor (1972) categorised the most common ideologies on education into four basic areas: **aristocratic, bourgeois, democratic** and **proletarian**. These ideologies are defined as follows:

- The aristocratic ideology focuses on education as preparing a young person for their social life, so the education must confirm with the social status of the learners.
- The bourgeois ideology sees education as a sort of test that successful people must pass to gain a prestigious position in work or public life.
- The democratic view of education focuses on the best way to share and distribute knowledge and skills to everyone, as a fundamental right within society regardless of background, religion, ethnicity, etc. Children's development is at the core of the educational process.
- The proletarian view was originally held by the aristocratic section of society, and sees the purpose of education as providing young people with a suitable kind of work so that the lifestyle of a particular group of the society - the leaders - could be maintained.

On the other hand, *Davies (1969)* distinguished in his point of view the educational ideologies into a different set of four categories than *Raynor(1972)* as: **conservative, revisionist, romantic** and **democratic**. These categories are outlined as follows:

- Conservative ideology focuses on maintaining and establishing the standards of the culture and community by respecting traditional values and educational sciences.
- Revisionist ideology emphasises economic language and aims to improve the system's competence in terms of job requirements and the current market's needs.
- The romantic attitude relates to the people's development by focusing on the students' progress, creative thinking, capabilities, etc.
- The democratic stance originates from social and liberal thinkers in the 19th century. This aims to provide equal opportunity for all in the community through teaching and gaining knowledge. Recently, a democratic socialist approach was developed by combining different disciplines and linking them with other ideologies. It has become common now in the form of public education.

However, *Cosin (1972)* classified the ideologies as four pairs of groups in quite a similar way as *Davies (1969)*. These four ideologies are as follows: **1- Elitist/Conservative**; **2- Rationalising/Technocratic**; **3- Romantic/Individualist**; and 4**- Egalitarian/Democratic**. The fundamental difference between these four ideologies and *Davies's* categories is that *Cosin* was clearer in describing their meanings, especially how the educational approaches enhance cultural quality, professional skill, equality and rights of proper education that each student has to gain *(Matheson, 2014)*. The first criterion, Elitist/Conservative, focuses on improving the established issue of cultural quality by traditional approaches. The Rationalising/Technocratic approach is concerned with the importance of professional education with an emphasis on an area of knowledge as well as on a community's needs. Romanticism has a central interest in enhancing all of an individual's inherent abilities. Egalitarianism maintains the belief that the equality of education is a right for everyone in the community.

The above arguments and classifications enable the building of an analytical model based on the multiple ideologies which influence an education system. These can examined in greater depth, perhaps breaking down the sub-divisions which have been suggested to be dichotomous *(Barton and Walker, 2011)*. Each ideology could be combined with others in relation to issues like knowledge, teaching resources, organisation, learning, assessment and

aims. These issues can be used as an analytical tool to compare the patterns of different educational doctrines *(Meighan et al. , 2007)*.

2.7 Development of educational theories

Educational theories are developed from hypotheses aiming to make sense of learning concepts. The ways in which educational authorities enact learning strategies and policies have significant implications in terms of the quality of educational facilities, pedagogy and curricula. The processes are based on elements including research and experiment that are intended to suit the educational objectives. Learning theories also facilitate the design of instruction methods, with approved strategies and techniques set out for providing optimal learning outcomes. Many educational developers use a theoretical background, which can be classified under three educational theories: behavioural, cognitive and constructional *(Ertmer and Newby, 2013)*. The following sections address these theories in turn, and consider other approaches to the development of educational pedagogy, as well as the variation of physical settings that suit each situation.

Behaviourism

'Behaviourism' as a theory was proposed at the end of the nineteenth century when psychologists examined and observed the automatic and involuntary responses of animals. Different stimulants and responses to them were taken into account in the development of the theory. Pavlov (1849-1936), Thorndike (1874-1949), Clark Hull (1884-1952) and Skinner (1904-1990) were prominent behaviourism psychologists who developed the understanding of behavioural changes in education *(Boghossian, 2006)*. Educational behaviourism is the systematic study and evaluation of students' performance in learning that relates to the frequencies of change in behaviour. It involves presenting a definite environmental stimulus to prompt suitable responses that generate learning[2]. It is the most influential theory of learning that emphasises behavioural changes that define learning as a permanent change in behaviour prompted by the learner's experiences. Behaviourists believe that human learning

---

[2] For example, Pavlov's dog experiment, whereby dogs were fed after a bell was rung, and began to associate the bell with dinner and that caused increased salivation on hearing the bell.

takes place in response to the environment that surrounds them, while inaccessible mental processes are avoided *(Ertmer and Newby, 2013;Jordan et al. , 2008).*

Classic behaviourism theory was inspired by Pavlov (1849-1936), who believed that learners respond to external stimulation in a specific manner. People gain knowledge and learn from a diversity of responses and the development of fears and phobias shape the learner's future behaviour, having learned the consequences of actions and situations. For example, a student who falls down stairs at an early age and breaks bones will be more cautious about stairs in the future *(Anrep and Pavlov, 1927).* This theory is the origin of the 'multi-sensory' educational approach, which claims that students' performance increases if all their senses are influenced *(Biggs, 2011)*, which indicates that diverse and interactive environments are more effective.

Edward Thorndike (1874-1949), an American psychologist, presented a theory of learning that was based on strengthening or weakening a response to stimuli, a theory which became known as 'reinforcement behaviour' *(Berridge, 2000).* The key principle of this theory is that rewards are an important factor that promotes learning conditions, which had previously been given scant regard to mental processing in behaviourist theory. This theory could be cited as the teaching strategy that improves the teacher's performance practice in instruction and education.

Clark Hull (1884-1952) developed the 'drive theory', which concerns the scientific laws of the learning and motivation processes. It was inspired by Darwinian evolutionary theory, which stresses the behavioural functions as being a mechanism, in which organisms follow two main forces, *drive* and *habit*. *Drive* is a force that promotes human behaviour, whereas *habit* is the consequence of stimuli and responses *(Weiner, 1985;Jordan et al. , 2008).* However, classic behaviourist theories suggest that a stimulus guides responses directly, while in other ways behaviour is a mix of stimuli and response. However, the drive theory adds to the consideration of the strengths of an organism, since the characteristics of the learner depend on habits also, not just the stimuli to which they are exposed *(Hull et al. , 1947).*

Behaviourism

Stimulus ⟶ Response ⟶ Reinforcements

- The surrounding environment, including the physical classroom environment features.
- The teaching strategy; which enhances the learner's senses.

Learners are generating the response as the stimulus which leads to change the behaviours

- Enhance the stimulus to generate a better response.
- Environment and teaching performance pay a critical role reinforcing the learner's stimulus.

Figure 3. The behaviourism theory sees learning as a behavioural change.

Although behaviourists take the surrounding environment and learners' circumstances into account, emphasis is placed on environmental quality (see Figure 3). Therefore, behaviourism theory identifies the actual elements that instruct the learners, as well as restricting the key criteria that affect the efficiency of students' learning *(Ertmer and Newby, 2013).*

Cognitivism

Significant theories and evidence refer to the proofs of cognitivism that affect learning and teaching: sensation, perception, attention, encoding, and memory. Behaviourist theorists did not consider these 'proofs', but cognitivist's developed them as a response to behaviourism who had neglected them to demonstrate cognition theory in learning *(Jordan et al. , 2008).* Processing the information effectively, and in an organised way, depends on the cognitive sensations that enhance students' learning. Therefore, the design of the learning experience and environment is based on how learners process the information and knowledge, and will help to optimise the learning quality *(Jordan et al. , 2008).*

The development and growth of cognitivism theory can be summarised according to four factors influenced by different disciplines, all of which have had impacts on stages of refinement of the theory. First is the development of experimental psychology, which investigates human memory through experimental research *(Davey and Sterling, 2008).* Second is the move from behaviourism to cognitivism, as the behaviourists realised later that learning is not only demonstrated by stimuli and response, but could also occur through forms of thinking processes and 'mental maps' *(Tolman, 1948).* The third factor is the language

acquisition of humans, as behaviourism and cognitivism stances disagree over whether language is shaped by a stimulus-response mechanism or by a brain process *(Larsen-Freeman, 2000)*. The final factor is the development of computer science, which, compared mental processes, acknowledges that the brain is similar to computer devices with respect to some of its functions *(Dai and Sternberg, 2004)*.

Therefore, cognitivism theory was developed through exploring gaps identified in behaviourism theory, and it is formed from five principles in relation to the quality of students' interpretation that have critical implications for the practical learning process. These principles also refer to cognition or cognitivist models of learning that are important to identify the relationships between the school environment and performance. These principles are as follows:

- **Sensation:** the processing of stimuli that comes from human senses (auditory, visual, touch, taste and smell) is impacted upon by the external environment that surrounds a person. Teachers and educators need to consider carefully the variety of students' senses to ensure that are all engaged through organising their learning materials in a way that will impress, rather than distract, the learner's attention. The same information should be presented wherever possible in a multi-sensory way in order to assist students' understanding and facilitate the smooth movement of direct sensory information *(Massaro and Cowan, 1993;Markus and Zajonc, 1985)*. Sensation principles are started within the classic behaviourism, but have been developed in cognitivism theory, which affects the student's interaction and motivation in learning. Therefore, the features of the classroom environment assist the teaching system through providing effective facilities that teachers can use to stimulate the students' learning.

- **Perception:** the process by which humans interpret sensory information to recognise the objects and things present in their environment. It involves many forms of recognition, like pattern recognition and detail in a three-dimensional scene *(Marr and Vision, 1982)*. This classifies perception by proximity, similarity, continuity and closure *(Kline, 2004)*. These principles are used along with bottom-up or top-down processing, which involve a mix of sensory data and contextual inferences that affect learning. Unconscious perception is also a principle in terms of perception: the ability to recognise phenomena that are not consciously acknowledged *(Brussow and Wilkinson, 2010)*. These all have a strong effect on teaching strategy and the learning

environment, by presenting the materials in a structured form to emphasise the distinctive knowledge in student perception that would encourage them to explore their emotional and attitudinal responses to the topics under study.

- **Attention***:* a process of focus and control involving concentration with limited sensory inputs on single or multiple things while ignoring others, which determines the intended motivation and actions that need to be taught. *Practicing* an action continually generates an automatic process, while controlled processes require *mindful awareness* and attempts, for instance a first time car driver usually considers driving as a controlled process that needs their full attention, whereas an experienced driver views driving almost as an automatic reaction *(Weiner, 1985; Jordan et al. , 2008).* Teachers are concerned about winning students' attention in the classroom environment, or in the learning procedure, so any rich or valued topic can be delivered via attractive strategies that will involve the learners' attention with the educational objectives. These strategies could be via narration (i.e. the 'story'), artistic objects or experimental ideas that could be achieved in an effective physical environment that attract and motivate learners. Presenting the teaching material in an interesting manner appropriate to the students' minds and adding plenty of activities and exercises has an important impact on the effectiveness of students' attention and understanding *(Keller and Kopp, 1987).* The classroom setting arrangement could increase the students' attention, which will be discussed later in this chapter.

- *Encoding***:** The way in which information is received is crucial in a learner's mental representation and understanding. Considerable research has suggested that organising learning resources into different categories and disciplines is important to ensure that learning quality is high. 'Schemata' are the mental frameworks developed within cognition which structure thoughts and patterns into a variety of aspects concerning people, events, situations, or objects for example *(Davey and Sterling, 2008).* These frameworks contain valuable and familiar coding systems like cultural references, scenes, scripts and personal beliefs, etc. For instance, each school has a different culture, location, style, layout and colour. Therefore, presenting the environment and knowledge in a variety of ways affects the sensory modes that support students in properly encoding information. The classroom environment might be considered as an

encoded principle, which represents the curricula, strategies, facilities and objectives of education *(Bartlett, 1995).*

- **Memory***:* This is the ability to remember or recall information and details, which have been taught, seen or heard. Human memory has two kinds of system, short term and long term, with dissimilar purposes and implications. Humans store knowledge and information in their brain as nodes which are stimulated when they search for particular information. The power of a memory relies on the links and connection of the memory points that have been formed by the senses *(Craik and Lockhart, 1972).* So, teachers have to consider that the students' short term memory can be affected by number of items or information which they have gained at the same time. These considerations are based on a discussion by *Thorndyke (1977)* that is important for the organisation and teaching quality of this research, and are as follows:
  - Learners remember the first and last point of the class hour more than the middle information;
  - Clear organisation of the subject curricula is required which does not offer conflicting or sophisticated knowledge without repetition in order for it to be retained efficiently;
  - Long term memory is required to link knowledge, cues or references which will remind students of information;
  - It is possible to enhance students' ability to create their own cues in order to discover their strengths in any field.

Cognitivism

Sensation	Perception	Attention	Encoding	Memory
Stimulate the student's senses. Auditory, Visual, Touch, Taste, Smell senses Influence the learning quality.	Cause through recognise the lesson via senses, teaching, and environment. Proximity, similarity, and continuity features of presenting the information.	It's the process that enhances the student's concentration on the particular subject while ignoring others.	Processing and organise the information received within cognition mental frameworks. Like cultural reference, events, situation, style, and location.	Ability to recall and remember the information effectively. Short and long term memory system that influenced by the senses and the encoded point.
Learning environment must be flexible and enhance students senses effectively.	Provide similar object, patterns or real object sample in the classroom to enhance the student's perception.	Interactive teaching strategies (activities, experiment, etc.). Changing – re-arrange the learning environment.	Link the environment with the lessons visually is significant to enhance the encoding principle in learning.	The learning environment and teaching quality enhance the student's ability to recall the information.

Figure 4. Cognitivism theory sees learning is structured mental change.

The overall outcome of the cognitivism theory, as shown in Figure 4, reveals that the teaching experience and learning environment play significant roles in enhancing learning. Knowing how people gain knowledge and process information is an important factor when designing an appropriate and successful learning experience. Teachers control the education process from a cognitive point of view, and learners are likely to discover more when offered encouragement. Therefore, educators need to take this into account by providing teaching materials that stimulate students' cognitive processes along with creating links in their minds that enhance their learning and sensory experience *(Weiner, 1985; Jordan et al. , 2008; Davey and Sterling, 2008).*

Constructivism

Constructivism is a broad group of theories that recognise learners as 'knowledge receivers' who make their own sense of experience and draw their own conclusions. It should be highlighted that constructivism is a progression generated by *cognitivism*. While cognitivism emphasises the ways that information is processed, constructivism stresses the methods that humans use to deal with information to develop and improve it. Therefore, learning in the constructivist view is an active process that leads students to build new meaning, ideas and understanding. It is important to track the development of this theory and key philosophers

include Piaget, Bruner, Vygotsky and Bandura as stated below; who illustrate impacts of the educational facilities on students' performance, including the physical learning environment *(Weiner, 1985;Jordan et al. , 2008;Von Glasersfeld, 1989b)*. The following sections summarise the theories classified under the umbrella of constructivist theory.

Trivial Constructivism

The meaning of 'trivial' is often associated with 'insignificance'. However, in this context, it concerns the ways in which people understand information that has been received by their minds, and then construct mental models that can overwrite previous models. These new models are recognized as new knowledge or education, which adapted by the learner's brain, and generate different impressions. The constructivist claims that learning is a personal act that does not have the same effects on each individual, which could mean that each student has different understanding of their curriculum or their appreciation of the learning environment. The multiple mental frameworks of students are fundamental factors which must be taken into account by educators in designing their pedagogy and teaching systems *(Larochelle et al. , 1998;Von Glasersfeld, 1989b)*.

Jean Piaget (1896–1980) is the 'father' of constructivist thought. His ideas centre on an ideology by which children's activity and engagement with their surroundings directs them to construct a core of learning. Playing and interaction are also seen as crucial for their cognitive development, so they should be motivated to explore, discover and learn about their surroundings. Piaget argued that the interaction between the cognitive structures and new experiences leads to conceptual development. Moreover, he called on educators and teachers to develop a learning system that engages students with the idea of creating their own knowledge, and encourages them to seek new connections and viewpoints, to create something original or unusual, instead of being provided with readymade solutions *(Piaget and Inhelder, 1969)*.

In a similar way, Jerome Bruner developed an idea that emphasises directing and motivating learners to gain knowledge through their own curiosity; Bruner adopted Piaget's ideas about active learning and instruction. But he developed a more-complicated level of cognitivism, in terms of the culture of education, by introducing the social importance of culture and language into considerations of learners' understanding *(Bruner, 1996)*. Bruner also suggested

that three crucial skills affect people's thinking: enactive, iconic and symbolic. He also recognised that learning occurs in a wider context and culture, which provides the fundamental base and which must be an appropriate environment. Bruner claimed that learning and knowledge are socially constructed *(Bruner, 1966).*

In terms of the education and learning issues addressed through trivial constructivism, the aspects introduced by Piaget are significant as they are based on an ideology that allows students to discover principles and find their own effective ways of learning. Consequently, interaction and discussion in the classroom are suggested, especially discussion between students rather than with teachers, and the circumstances of learning environment should facilitate this. The socio-cognitive conflict between students might enhance their performance by letting them discuss their knowledge, and then enhance their understanding and stimuli. Piaget's principles in relation to teaching and learning activities can be summarised as providing interactive and physical activities. Using cognitive methods that generate creativity and stoke the imagination allows students to both experience and be involved in opportunities for discussion and exploration *(Long et al. , 2011; Piaget and Inhelder, 1969).*

Bruner (2009) also suggests that educators develop students' various skills at all ages through a variety of modes, depending on the learners' ability and understanding. For example, the representational modes that Bruner recommended are divided into three factors: an inactive mode (0-1 years) by which students have to be able to handle objects, an iconic mode (1 - 6 years) which involves students' ability to imagine and think about things visually in form of diagram or pictures, and then a symbolic mode (7 years onwards) in which a student must accomplish a symbolic operation that is already stored in their mind as a code or symbol-like language or particular sign that refers to a class *(Bruner, 2009).* These modes also must be considered within the learning environment and it is important to determine how to create the space as a motivator of students.

Social constructivism

Society's beliefs and environmental factors influence how and what people think and perceive. The understanding of knowledge and outcomes as trivial constructivism depends on personal mental backgrounds and strategy; constructivism stresses individual differences: people actually share the environment and all elements of social life. This is a factor that

plays a significant role in learning. Therefore, social constructivism focuses on the function of society and culture in terms of the learner's understanding and realisation. It is argued that people usually create similar understandings through discussion, but do not necessarily arrive at the same conclusions, because two students having exactly the same understanding from exactly the same teaching class is unlikely. Therefore, social constructivists discuss that learning is a consequence of language and social interaction issues *(Bruner, 1966;Jordan et al. , 2008).*

Lev Vygotsky (1896 – 1934) and Albert Bandura (1925) developed the theory of social constructivism. The Russian psychologist Lev Vygotsky wrote about social processes as a core, affecting how cognitive understanding arises. Taking an opposite perspective from that of Piaget's 'inside out' approach, Vygotsky developed the theory called 'outside out' with emphasis on the internalisation of contact between parent or adult on one side, and children on the other by using activities, tools and language to create education and learning. Therefore, in this theory, human activity is classified by the extensive range of tools that might be used; for instance, language is the most significant tool that children initially use to communicate and interact with each other. It enhances their ability to carry on discussion of a developing concept and build their knowledge. Schools are thus seen as cultural tools that exist not just to teach the community, but also to let people naturally develop, and to provide them with interaction that forces their mental functions to learn and receive new knowledge *(Garton, 2008; Vygotsky, 1978).*

Vygotsky developed the idea that the role of teachers and educators is to guide learners and enhance learning procedures, besides present the best possible support to advance students' thinking, achievements, knowledge, experience, and function. While Vygotsky argued that children learn through the means of language, the Canadian psychologist Albert Bandura proposed that the imitation of stimuli is a cognitively effective way of learning. Bandura demonstrated the idea of "observational learning", based on an experiment that he applied in a Kindergarten involving children playing with a Bobo doll. In this experiment, children watched a film of a woman playing with a Bobo doll and toy hammers, then were given the same tools seen in film and allowed to behave freely, with the result that the children imitated the woman seen in the film. The experiment showed that children's behaviour and actions depend on the way they have been shown educational materials by parents or teachers. These actions are considered as imitative actions, not original actions, indicating that learning

happens by observation and through the senses more than via theoretical explanation *(Bandura et al. , 1963).*

Consequently, social constructivism theory is influenced by Vygotsky's ideas about 'guided learning' and a 'scaffolding approach'. Guided learning is a constructed approach by which teachers manage discussions to share and join knowledge, whereas the scaffolding approach aims to enrich students' minds to generate new knowledge, and it consists of providing resources and challenging activities accompanied by a mentoring system from teachers to allow students to construct their understanding and performance independently. Classroom strategies must be suited to a scaffolding approach if it is adopted, such as offering students plenty of time to develop relationships with each other, and then giving them the opportunity to respond freely in lessons and shape the teaching method to ensure students are building an understanding of concept and knowledge. This motivates students to engage themselves with the subject and with the teacher by asking open questions and requesting preparation to find solutions *(Tharp and Gallimore, 1988).*

Critical constructivism

Critical constructivism encourages people to be self-reflective and to challenge and raise clear counter views that oppose the predominant social opinions. Additionally, this approach is recognised as 'critical pedagogy', which is particularly appropriate in community education and adult education circumstances. Paulo Freire (1921 – 1997) and Jürgen Habermas (1929) developed critical constructivism based on background research by Michel Foucault (1926 – 1984). Together, these psychologists, who support a critical pedagogy approach, played a leading role in the development of constructivism, as will be briefly discussed below *(Bruner, 1966; Jordan et al. , 2008).*

Michel Foucault argued that knowledge is intimately connected with power. In other words, knowledge involves a group of disciplines such as habits, practice, attitude and theories all of which are naturally internalised by people in order to understand information. Therefore, people realise that they must behave 'correctly' to respect the rules or regulations that will affect their mental and behavioural condition. Foucault also claimed that social knowledge is strongly connected with political issues, in line with Freire's ideas *(Foucault, 1977).*

Paulo Freire was a supporter of critical constructivism whose home town was a poor, peasant area in Brazil where literacy was very low; this background acted as inspiration for him to develop his theory. Freire was raised in a town whose educational vision was based on Marxism, anti-colonialism and liberation theory, and this context emphasised the necessity for a new trend of education that addressed the needs of persecuted people and recognised the value of their role as developers and producers. It was also necessary to bring a halt to being treated as slaves and being forced to learn the colonizer's culture. A theory was needed which could be used to advance the people's understanding of their situation by experiencing their poor life quality, and then proposing ways to improve it. Therefore, this approach suggests democratic relationships between teachers and students without any separation of roles between them *(Freire, 1970).*

Habermas claimed that communication between people creates knowledge and reasoning. He developed a theory that he called 'pragmatic', which is focused on action and practice. The creation of reason and knowledge, as Habermas argued, is achieved by social practices of communication, which are based on many rules like the expectation of truth and honesty, as well as the acceptance of all community parties *(McGuigan, 2002; Jordan et al. , 2008).* Knowledge has to be expressed in clear language that is explicit for all in the community and is accepted and understood by them, so communication is a crucial tool in constructing knowledge and facilitating expression. Moreover, good quality communication leads to a better understanding of people's social and political situations *(Habermas, 1992).* Consequently, critical constructivism recommends that educators pay attention to the relationships between themselves (the educators), teachers and students, ensuring that they are equal. This is particularly important in adult and community education, within which some individuals might be more disempowered than others, with a serious impact on the process of learning and education.

Constructivism

Trivial Constructivism	Social constructivism	Critical constructivism
Student understanding approaches are varied, within stages depending on their ability.	Students understanding are influenced by their social and cultural background; which affects their learning and realisation.	Students understanding are self-reflective, generated by their mental and behavioural condition. It's critical theory that opposes predominant views.
Develop system and environment that support students to generate original ideas.	Emphasis on the connections between learners and their social factors in learning; And usually, leads to similar conclusions.	The positive relationship and communication between the teachers and students are important in learning.
More creativity, imagination and exploration methods to be used. Enhance students to discover their own ways in learning.	Guide learning by the teachers to construct learning through manage discussions and challenges that enhance the students thinking.	Equal opportunities and appropriate facilities are crucial for this theory. It's usually recommended in adult and community education.

Figure 5. Constructivism learning theory

The key points about constructivism theory are shown in Figure 5, which aims to demonstrate how people learn and indicates the implications of constructivist theory and its principles. The constructivist approach to teaching and learning was first suggested in the 1960s, and it still appears in some current educational systems, because it shares many modern approaches in education. This is clear from the new approaches introduced recently which suggest that an increase in learners' motivation can be provided by sharing knowledge and meaning-making, which enhances task performance not just in the early stages of education, but also in adult learning and at university level *(Bruner, 1966; Jordan et al. , 2008; Von Glasersfeld, 1989a).* It also highlights democratic strategies that all students are equal in rights but have personally different abilities.

2.8 Learning approaches

The development of education philosophy discussed above shows the variety of ideologies and perspectives that the philosophers have taken into account in terms of providing an effective learning environment. This leads to a range of beliefs, ideas, hypotheses, theories, implications and thoughts within the education sectors which direct the educators to choose one of these approaches for their own education ethos. Each educational authority supports a

particular learning approach, or set of strategies, that suits their culture, community, religion, and understanding. A challenge for educational authorities is to build up a teaching system that satisfies their national idiom, through appropriate policies, objectives and future vision *(Long et al. , 2011)*. The education system has to consider the criteria, discussed above, to be active in engaging learners' thinking and imagination in their lives, and additionally it has to support students in collaborating and co-operating with their colleagues in order to create opportunities for them to have discussions with their colleagues, and develop ideas and solve problems without their teacher's constant instruction *(Biggs, 2011)*. Involving technology and facilities in learning has a part to play in supporting learners' creativity and outcomes *(Carr, 2006)*. Many approaches have been developed in terms of providing the most effective learning system; these approaches are discussed in detail in chapter three, and especially in the teaching environment section.

2.9 Education system

Education today is highly valued and yet there are still divisions about its nature when addressing a variety of aspects: formal education is evolving at an increased pace, and is demanded in most countries worldwide. The educational authorities that comprise the Ministry of Education in Kuwait are generally authorised and managed by the Kuwaiti government. In most countries, including Kuwait, the education system developed in the form of a schooling organisation that consists of public schools or a combination of public and private schools, and an expanding system of higher education which includes universities, colleges and other educational institutions like religious and practical schools. These places of learning take on the responsibilities of the overall education strategy under supervision of the government, which is concerned about the quality of these educational institutions and has to form a spending strategy for educational generally, one of the state's most significant priorities. However, the assumptions that these institutions take into account in understanding the education system are vital, and critically translate into their development strategy *(Woods and Barrow, 2006)*.

These institutions are responsible for teaching their students a wide range of arts, sciences and skills, including language, art, computing, and design and engineering. They mostly take a democratic approach to provide education for all members of society. The curriculum system

was originally based on five liberal sciences: grammar, the formal structure of language, ethics, composition of, and presentation of, argument. These systems have also been popular in classic education in a traditional 'Victorian era' style of teaching. Some educators and theorists have stated that these schooling styles have tended to suppress the individual potential of children as they are supposed to build individual uniformity and collectivism in terms of opportunities *(Robinson, 2011; Bailey et al. , 2010)*. According to *Caro (2008)* the two main objectives for education are as follow:

(A) The development of the learner's abilities, talents, social and moral character, i.e., their socialisation, to become well adjusted, productive, responsible members of society.

(B) Learners learn what is needed for them to function in their society.

New approaches developed by scientists and theorists have meant that the education systems around the world have transformed from traditional education systems that consist of selective aspects of knowledge to a more infinite world of practice, knowledge, ideas, and theories. These aspects have created a new strategies of education that are completely different than what was formerly applied *(Robinson, 2011)*.

Therefore, each contemporary educational system is based on the understanding of the following factors or criteria, which have an impact on the overall education and especially on physical learning environment, these factors are discussed briefly below.

Educational theory

As mentioned in Section 2.7 (Development of educational theories), the ways that the three theories of education (behaviourism, cognitivism and constructivism) are understood by an educational authority have a crucial influence on methods of education. The understanding of the educational theories reflects the performance and experience of learning features, including the physical learning environment, which have critical value on the overall quality of instruction *(Smith, 2003b)*. Education relates to the action of learning, which is the interaction between individuals and ideas or experiences, and can be defined as a body of information that exists in human thoughts and abilities. Carl Rogers (1902-1987) was a psychologist who focused on humanistic approaches, and he stated that the learning process

involves grasping and comprehending the actions needed to identify what students need and want to know *(Smith, 2003b)*.

Therefore, education theory leads to the learning process, which is a combination of schemes, ideas, facilities and considerations, which together direct the action of education, paving the way for learning to occur in a systematic way *(Arthur and Peterson, 2013)*. This needs particular attention by the educational authorities to enhance educational systems, based on the relevant and appropriate theories, which enrich the students' experience in learning.

Learning disciplines (organisation)

Education concerns several areas that are built up from educational philosophy, which aims to improve the understanding of the educational performances and facilities. Educational authorities aim to improve the educational outcomes for students constantly. Developing an effective educational system is the core objective that the decision makers have to follow. Updating the strategies in recent teaching and learning facilities in all educational fields like pedagogy, andragogy, the curriculum, policy, and organization is important *(ARC Linkage, 2010; Edwards, 2006)*.

Educator needs

The significant roles educators provide are concerned with learning and education excellence, and especially the physical learning environment. There are divisions into two areas of focus; First is the preferred element that supports and enhances the pedagogy system, curriculum, and policy *(Martinez-Pons, 2001)*. Second is the interaction and motivation of students in the physical learning environment, including key elements such as collaboration, achievement, functionality, outcomes and academic development *(Peter and Janine, 2013)*. These two focal areas are linked to each other, which considering *what* should be taught is equally important as *how* to teach it: the quality of the curriculum will be seriously affected by the quality of teaching, and vice versa. While the learning environment set in between them and seriously affects the educators satisfaction level.

Pedagogy

The term 'pedagogy' is defined as 'any conscious activity by one person designed to enhance learning in another'*(Mortimore, 1999 , p3)*. Generally, pedagogy is concerned with the way teaching is done, and information given; it could also be explained as the way in which the

teaching instructor activates the learning for students or learners and that includes the learning environment setting and facilities. Educators write about a broader term for adult's education which is 'andragogy', which refers to sets of guidelines, philosophy, assumptions and theory; which appropriate on developing adult learners and engaging them into the structure and scheme of learning via the learning environment *(Knowles et al. , 2011; Mortimore, 1999)*. The following paragraphs reflect a variety of sources that indicate the significant concerns held by educators in the context of learning pedagogy, with reference to the quality of the learning environment:

- A variety of teaching methods were adopted in early studies which demonstrate different techniques, and examine the issue of accessibility in supporting learners' stimulation and interaction, by advancing the effectiveness of the learning style through their learning environment. Teachers have to be able to provide a more-active learning process that covers pedagogical strategies such as collaborative learning, cooperative learning, learning communities, integrated learning, project-based learning, work-based learning and community-based learning, along with teachers' personal approaches to teaching, whether these are democratic or authoritarian, integrative or dominant. These approaches need different space organisation, which are strongly affected by the teacher's assessments, abilities, curriculum, and routine tasks in the pedagogy context. These learning practices and processes have several benefits: they advance the learner's conception, improve the learning ability and increase the active elements in learning *(Wolff, 2003; Sorrell and Sorrell, 2005; Bruner, 1996; Mortimore, 1999)*.

- Teachers have the responsibility for choosing appropriate pedagogy styles that enrich the quality in delivering the curriculum to the learners, by practicing the best adaptive methods in teaching that suit students, who have to be conditioned to receive the message. *Moles (1989)* stated that:

  > *"Classrooms are crowded and busy places in which groups of students that vary in interests and abilities must be organised and directed. Moreover these groups assemble regularly for long periods of time to accomplish a wide variety of tasks. Many events occur simultaneously, teachers must react often and immediately to circumstances, and the course of events is frequently unpredictable.*

Teaching in such settings requires a highly developed ability to manage events" (Moles, 1989 , p 11)

Although classroom activities determine the coherence of the teaching objectives, these contexts could be more (or less) dynamic, due to the teacher's attitude and efficiency to those activities, which is reflected in the quality of the class time. The quality of an education system and pedagogy cannot go beyond the quality of its teachers: teachers have to add some appropriate techniques such as using the features of the curriculum to create new or unfamiliar practice that supports learning and stimulation *(Wolff, 2003; Martin et al. , 2006; Barber and Mourshed, 2007a).*

Curriculum

The curriculum - what is planned to be taught - it centres on the knowledge and practice that the educational authorities are aiming to deliver to learners, typically divided into subjects that are well-ordered and arranged to be suited to learners' ages, capabilities, cultures, interests and wishes. Creating a curriculum that can apply to different schools is important to help students reach meaningful academic and social goals. Optimal learning and teaching does not occur purely through improving the quality of learning environment in itself, but it is possible through developing new areas of the curriculum, which can support creative thinking and innovation. Thus, improving the curriculum can have a critical effect on learners' thinking and outcomes and can suggest opportunities for better creative learning spaces in schools. Teachers have vital responsibilities to achieve these goals by using different methods to improve the quality of teaching *(Kuropatwa, 2012`; PPRC, 2001; Allen and Hessick, 2011).* According to *Burke 2007*:

> *"Teachers should not be tied down by the tight restrictions the curriculum presents. They should be able to plan a lesson in the way they wish and develop it into a worthwhile life lesson; maybe the pupils will treasure it and apply it within their lives. Captivation of the imagination guarantees a lesson will stay with a person and not be forgotten the moment the classroom is vacated."* (Burke, 2007, p.35).

A curriculum nowadays involves consideration of the content, structure and technology required, which drives learning by being more integrated. Some educationalists argue that setting a curriculum is an act against creativity, due to its organised structure and demands to be delivered within short time periods; they maintain that these factors obstruct the ability to

encourage learners to interact with the content of education *(Robinson, 2006)*. A dictation method of teaching, which places teachers directly at the centre of learning, with learner's simply recording information from teachers without interactions and illustration. This method has been demonstrated as one which has a poorer influence on learners' uptake of knowledge and skills, and involves less interaction with the learning environment, compared with the problem-based learning or interactive teaching approaches. Thus the learning environment features have to be appropriate to the sort of knowledge that needs to be delivered in order to encourage learners to interact and be motivated efficiently *(Lackney, 2000; Burke, 2007; PPRC, 2001; Robinson, 2006)*.

Policy

There are common beliefs by educators and policy makers about the vital correlation between the good quality of education and government policies. Education policy seeks to address questions about the purpose of educational objectives and to give structure to the achievement of educational aims. These policies have an impact on improving quality of life worldwide and are rooted in educational philosophy and ideologies. Pedagogy and curricula are created from a chosen education policy, referring to the principles and instructions used to establish plans or make decisions to achieve the agreed outcome of education. The forming of educational policy is undertaken by educational authorities (government), or by political parties that intend to influence and guide the actions that support and determine the learning outcomes. Educational policy makers are concerned about a suite of information: education theory, the economy, budgets, social development, creativity and so on, and they have to examine their education system regularly and set standards which define what should be achieved. Policy makers have to share information and practices with other authorities in order to identify good practices and find solutions for their problems by communicating and aligning their policy with international policies *(Lippman, 2010a;McIntyre, 2006;Burke, 2007;Barber and Mourshed, 2007a)*.

Developing educational policy is a fundamental strategy to change the consequences of schooling; distinguishing between the purpose and function of education is important in this matter. A definite vision of the purpose of education is the central goal of the process and must be shaped by policy makers adhering to up-to-date requirements, and achieving goals as a result of the pedagogy approach and curriculum which advance the educational policy

(Yero, 2002). According to *Barber and Mourshed (2007a)*, who link policies and performance in the classroom, *"It was naive to expect that classroom quality would improve just because we changed our structure" (Barber and Mourshed, 2007b, P 11)*.

Consequently, cooperation between educators and designers along with policy makers is significant as it supports the engagement and integration of the educational mission and allows dynamic design to inform education *(Bogle, 2006)*. In general, the following points have been made explicit by several policymakers and educators' reports. Together they build a clear vision of the important issues that have to be considered by educational policies as well as the physical learning environment have to pay attention to these points *(Barber and Mourshed, 2007a; Edwards, 2006; Higgins et al. , 2005; Whitty, 2006)*:

- o Policies must be focused on the professional development of resources, organization and people.
- o Policymakers must listen to the voice of the educational authority and be in touch with all actions undertaken by them.
- o Educational policies must be based on various viewpoints from those who are engaged in educational and learning environments, such as architects, designers, environmental scientists, teachers, parents and other members of the community.
- o Reducing the classroom size to facilitate lower numbers of students per teacher is recommended.
- o Ensuring the good quality of teachers in the classroom will ensure better outcomes.
- o Policies should respect the culture, region, religion and beliefs of all.
- o Providing higher quality of facilities and features for teachers and educators will enhance the quality of teaching and education.
- o Raising the level of academic achievement of teachers and educator will raise the quality of outcomes for learners.
- o Sustained and substantial improvements in instruction in learning can be delivered by inside-classroom investigation.
- o The responsibility for monitoring learning outcomes and the quality of teaching has to be separated from the responsibility of improving them.
- o Greater public accountability and awareness drives further improvement in respect of the educational needs of the future.
- o The mechanism of support schools to deliver high quality instruction to every child equally should be strengthened.

- An active community of educational researchers should be encouraged who are engaged in the process.
- Resistance to inappropriate quality criteria in the education system should be considered by carrying out independent investigations. This is entirely appropriate for education research in a society.

Summary of Chapter two

The philosophy of education was reviewed to clarify its correlation with the learning environment. The discussion was structured to link the research aims and objectives with the theoretical foundation of education, including the education definition, history, theories, approaches and systems.

Each of these areas is vital to facilitate the establishment of an optimal educational system, which needs critical attention to achieve the proposed outcomes. As mentioned earlier, and as illustrated in Figure 6, 'learning' is an alteration of behaviour or experience that results from increasing the learner's knowledge, based on their memorising, acquiring facts and skills, abstracting and understanding the reality and meaning of the world. Educational authorities or organisations have the power to improve the quality of learning through the development of policies and arrangements first, and then apply those policies effectively in the schools. Pedagogy and curricula are core factors that support the educational process and purpose, while the educators and teachers are the contributors to, and executors of, these factors.
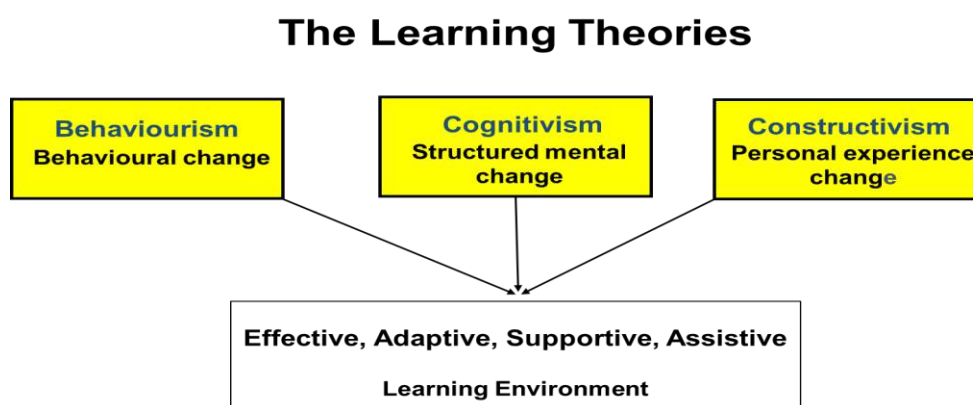
Figure 6: The learning theories requirement on learning environment.

Educational organisations and authorities are required to provide efficient, optimal, improved, encouraged, strong and well-planned learning for students. Based on detailed considerations of polices, aims, objectives, which reflecting an understanding of culture, needs and desires. The quality of the learning environment has to be part of what educational authorities consider, as well as appreciating the influence of environment on students' behaviour and performance. The following chapter emphasises the theory of learning environment, to expand the literature review about the impact of the physical learning environment.

Chapter Three

Theory of the learning environment

The design of the research

Stage	Description
Background study:	Identifying the gap in the existing knowledge to validate the research proposal
Aim and objectives:	To develop a better understanding of the interrelation of physical environment and learning performance
	Identification of important physical elements/factors which have important bearing on learning environment

Exploring socio-spatial organisation of learning environment

Examining feature that characterises the learning environment

Assessing the mechanism of integration of all socio-physical factors in learning environment

Conduct a Pilot Studies in random schools in Kuwait to obtain an initial data and check the methods

Literature review:

Promoting the approach of the study and developing a conceptual framework for the research

Research concept — Research questions — Research strategy

Empirical work: — Establishing criteria for the case study

Tracing the physical and environmental characteristics of selected schools

Examine the students' performance and motivation in each school

Comparative analysis of the collected data from the case study

Conclusion: Responding to the research questions by summarising the findings and suggesting the research implications for practice and research

3 Theory of learning Environment

3.1 Introduction

Literature about the *philosophical* vision of education was discussed in Chapter 2. The present chapter illustrates the *theoretical* background of the learning environment in terms of architectural and interior design principles. People are affected positively or negatively by their surrounding environment, which influences their wellbeing. The impact of the social environment on human behaviour has been studied in several areas. Each individual seeks comfort within their environment, surroundings, dwellings and places in which they work or study, where they expect to be safe, secure, and comfortable, in relation to their cultural, social and psychological expectations *(Read et al. , 1999)*. The interactive relationships between the individual and the environment is widely discussed within social science research *(Kopec, 2006)*.

In the learning environment, students, teachers, and school staff are influenced by their surroundings, including the social, teaching, cultural, psychological and physical circumstances *(Lackney, 1994)*. The influence of environment on user behaviour and performance have been studied within architecture, sociology, psychology and educational research fields. Each of these fields has a different definition of the learning environment *quality (McNeill et al. , 2006)*.

Table 2. The structure of learning environment theory
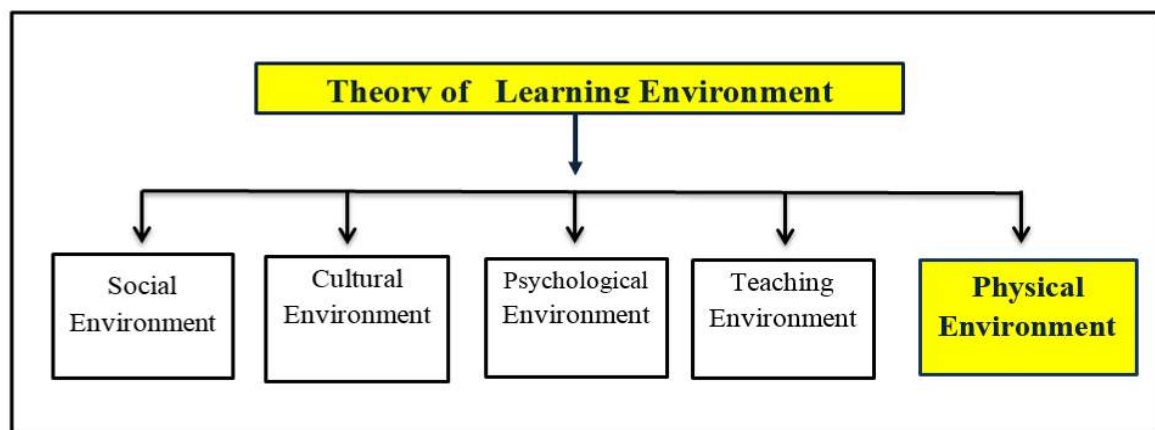
The theories concerning the characterisation of the learning environment have been discussed within variety of categories as shown in Table 2. This section briefly discusses the social environment first, and then the physical learning environment in detail, examining the impact of the physical learning environment on learning and teaching performance and quality. This highlights the social, cultural, psychological and teaching factors. These factors direct the present discussion to emphasise the physical factors at the core of the present research. The headings used are:

- Reviewing the theoretical background of the learning environment.
- The impacts of the learning environment on user's behaviour, attainment, feeling, and performance.
- Development and assessments of the learning environment.
- The principles and the evidenced based research of physical learning environment and the key elements in the physical learning environment.

3.2 Theoretical background of the educational learning environment

What is the 'learning environment'?

The term 'environment' refers to everything around us, and within it, each aspect of it has a different effect on human behaviour, productivity and perception. The definition of 'environment' in the Cambridge Dictionaries online is *"The conditions that you live or work in and the way that they influence how you feel or how effectively you can work"* *(Dictionary, 2015)*. While *Sallis et al. (1998)* define the environment as the motivators or elements that affect behaviour positively or negatively.

'Learning' is the process of receiving intellectual information on a particular subject to gain knowledge and skill *(Compact Oxford English Dictionary)*. However, *Rowntree (1998)* points out that learning is not only from the verb (to learn), but is the *activity* that is undertaken to obtain knowledge on the particular subject. It is also the *noun* which means that learning is something gained.

The context of the 'learning environment' as mentioned by *Lippman (2010a)* comprises the learners, teachers and the physical situation, and the association between the learners' motivations and the time and place when and where knowledge is acquired. *Uline (2000)* claims that the learning environment is high-quality space which is significant for educating. Students have to attend schools which provide appropriate facilities that are structurally safe, have clear emergency exits, safe water supplies, appropriate plumbing conditions, adequate light and attractive decorations, as well as appropriate acoustics for noise control.

Effective learning environment

"We shape our buildings and thereafter our buildings shape us" (Churchill, 2007)

Recent studies showed the learning environment has both direct and indirect impact on learning and behaviour *(Crawford, 2013)*. *Taylor and Enggass* conclude in their book: *"The ideal educational environment is a carefully designed physical location composed of natural, built, and cultural parts that work together to accommodate active learning across body, mind, and spirit" (Taylor and Enggass, 2009 ,p.40).*

The study ethos of what constitutes an effective learning environment in the 21st century has been widely influenced by the transformation and development of the teaching methods in the educational system. As discussed in chapter two, the education in the western world has moved away from the traditional way of simply giving instructions, towards a more flexible way of providing learning without direct teachers' lessons *(Rowntree, 1998)*. Self-learning strategies, materials-based learning, social-based learning, and independent learning have been developed that lead to student-centred learning. The concept of student-centred learning was based on the constructivist learning theory, where the leaners 'construct' knowledge from their experience *(Jonassen, 1991)*. In terms of the learning environment, *Barber and Mourshed (2007a)* draw attention to a positive correlation between curriculum, pedagogy, facilities and environment factors. These factors play a crucial part in the development of an effective learning environment *(Lackney, 1994)*. This development of student-centred learning encourages architects and designers to introduce an environment that suits that development, and directs learners to be educated without pressure and direction *(Robinson, 2006)*.

Kopec (2006) explained that the main purpose of a learning environment is to support and enhance the physiological modes for human understanding (e.g. visual, auditory and kinetic). However, *Higgins et al. (2005)* detailed that the learning environment influences human behaviour through both physical and social factors. Consequently, the environment and its associated features can have a significant influence on students' learning and general behaviour and attitudes *(Eisermann, 2005). Jonassen and Land (2012)* described this as the environment that can be seen as a series of connections and relationships between people and things. These things could be furniture, colour, arrangement that influence peoples' feelings, behaviours, attitude and satisfaction. Therefore, the quality of the learning environment is important in term of the relationship between the environment and learning excellence.

The physical environment factor concerns the quality of the space and organisation, which can be classified as interior design and architectural considerations, while other aspects focus on crucial concerns that affect the quality of physical environment. Emerging from these factors leads to the phrase 'effective physical learning environment', which is discussed from several perspectives that identify the significant effects of the learning environments. Two key issues are considered to be important in enhancing learning outcomes: the educational structure and practices; and the educational environment *(Berris and Miller, 2011)*. The educational environment is the focus of this review, due to its significance in shaping the learning system and learners' engagement, facilitating ideal adaptive learning behaviour, motivation, influences and achievements. The impact of the learning environment on users is presented below.

3.3 Impact of learning environment on users

A large and growing body of literature has reviewed the significance of the environment on learning excellence; these studies demonstrate that the impact of the contributory factors pictorially shown in Figure 7: physical, psychological, social, cultural and teaching environment *(Rutter, 1979; Frith and Whitehouse, 2009; Uline, 2000; Skinner, 1953; Hirschy and Wilson, 2002; Patrick and Ryan, 2003; Hutchinson, 2003; Smith, 2003a)*
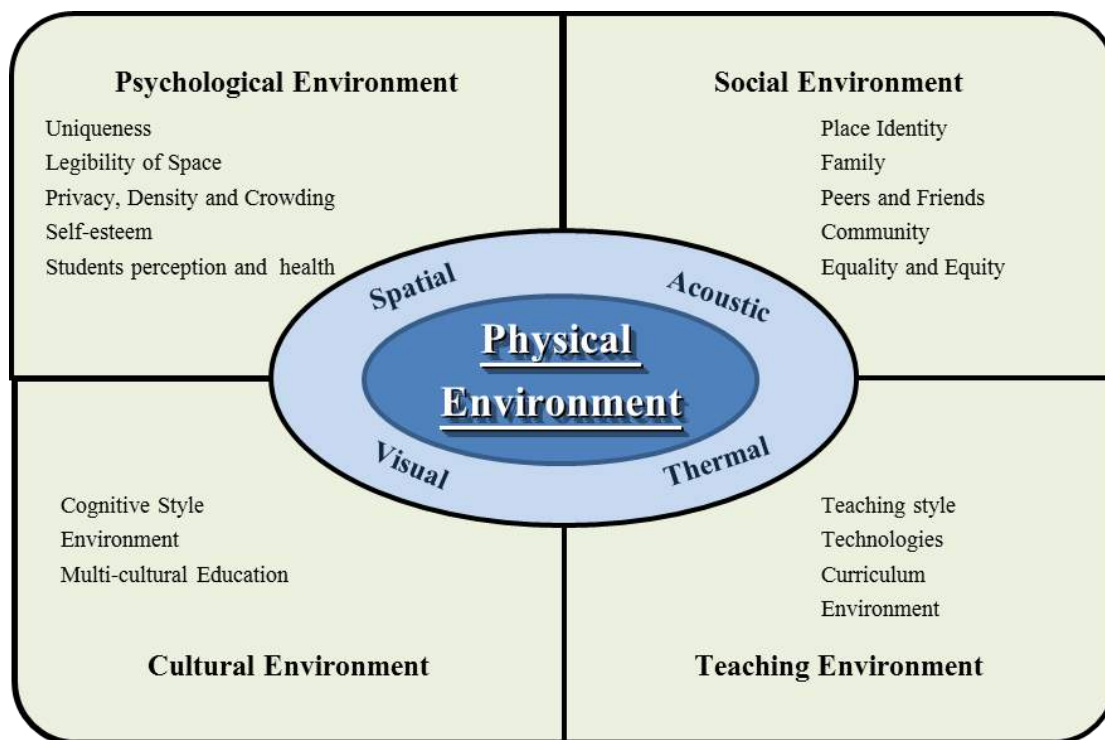
Figure 7. Five factors influencing the learning environment

Each of these factors has an impact on the user's behaviour and performance, which constitute the overall quality of learning environment *(Fisher, 2001; Frith and Whitehouse, 2009; Jonassen and Land, 2012)*. It is important to emphasise that the four non-physical environment factors are classified as social, psychological, cultural, and the teaching environments. The following sections describe details of these four factors which lead to an appreciation of what is meant by the 'physical environment'.

Social environment

The social learning environment is a crucial element within learning theory which cannot be classified as an separate factor within learning philosophy *(Mercer, 2000)*. It is a major topic of interest within the concept of describing the learning environment. *Casper and Barnett (2001)*, identify it as the physical surroundings, social relationships, psychological aspects and cultural backgrounds which affect students' function, interaction and performance. However, *Jordan et al. (2008)* emphasise that the social environment is classified as a personal process that includes multiple factors such as social setting and relationships with their colleagues.

Martin et al. (2006) emphasise that the function of the spaces is important, and they consider the social rules and settings for each group of the society to enhance the user's ability to perform, behaviour and attitudes. Understanding the social dynamics of space in the early stages of building design is an important element for learning, which transforms the quality of teaching and learning environment *(Wannarka and Ruhl, 2008)*. The relationships between the social environment and physical environment in learning spaces are significant and have been discussed widely in the literature *(Martin et al. , 2006; Weinstein and David, 1987)*.

The sociological theory about classroom activity was developed by *Hirschy and Wilson (2002)*, which indicates that knowledge is socially constructed, since students are part of the community and their environment. This allows their experience to be dissected, evaluated and reflected upon. *Wolff (2003)* also suggested that the students' sense of security and confidence in the learning environment increases if they are allowed to personalise their environment, which gives students a sense of ownership.

Jordan et al. (2008) discussed the theoretical perspective of social learning from two main aspects. First is the sociological aspect, the social interaction and roles within the society, while the second is the psychological aspect which is the influence of social factors on cognitive activity and stimulation. In this model, social learning cannot occur as one individual activity, but is composed of a set of social interactions and factors that create an optimal learning experience. The demonstration of the social cognitive theory in learning is shown in Figure 8, which indicates that there is a correlation between the person's behaviour, characteristics and environment: if one factor is ignored the overall learning quality will be affected.
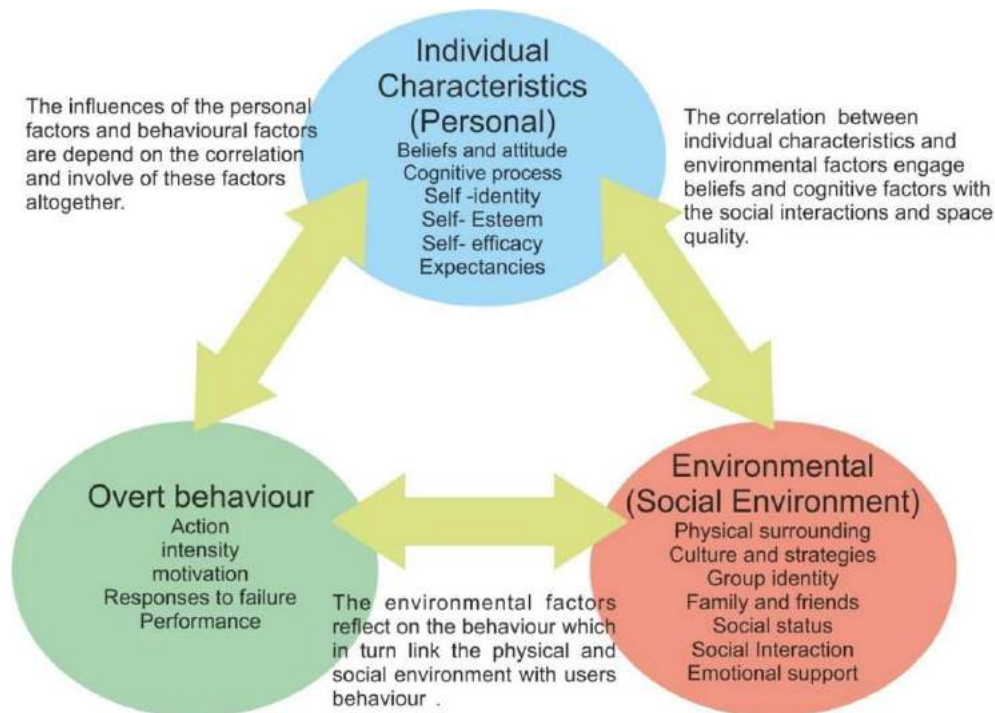
Figure 8. Social Cognitive Theory (Bandura, 1986, Jordan *et al.*, 2008)

The reciprocal determinism theory developed by the psychologist *Albert Bandura* (1925) is the concept where a person's behaviour and learning is influenced by personal factors and the environment. These three components (personal characteristics, overt behaviour and social environment) illustrated in Figure 8 are interconnected, in that the learner naturally anticipates similar consequences within the three factors. Any difficulties in one factor will influence the overall impact and quality *(Bandura, 1986)*.

Numerous studies show that the relationships between social environmental and other educational factors are crucial, and could create a positive influence on health, activity, behaviour and productivity. These influences are vital for providing positive learning environments for educational quality *(Lee and Cho, 2013; McNeill et al. , 2006)*. Consequently, the following sociological aspects of the learning environment theory are discussed below (see Figure 9).
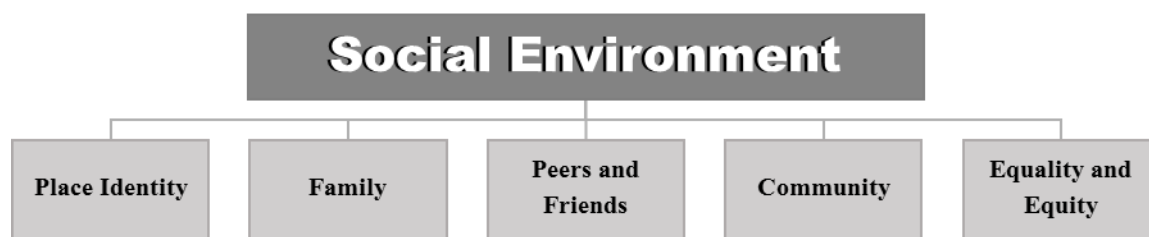
Figure 9. Social environment aspects

Place identity

'Place identity' refers to a concept that is based on environmental psychology, which enhances the student's performance by establishing a meaning and significance of *place* for the student – a 'sense of place'. Personalising the student's conceptualisation of the environment can be achieved through a range of physical elements and techniques that supports them in understanding their surroundings, and then satisfies their needs *(Hirschy and Wilson, 2002)*. Establishing effective place identity provides a sense of ownership, attachment and familiarity for the students and teachers. These factors can facilitate developing a sense of security, confidence and productivity when faced with a challenge.

The location of the school and its surroundings affects the student's senses, which develops a familiarity with their community. Additionally, it is important to enhance the opportunities to connect the school with nearby places like museums, libraries and parks *(Trancik and Evans, 1995)*. Allowing students to personalise the environment in their own way can enhance the theory of place-identity and introduce them to other views of the social environment which affect their behaviour *(Long et al. , 2011)*.

The family

Research conducted for Latin American students showed that family factors have a positive correlation with student achievement and success, and identified that family support is a significant issue for students' academic motivation and attainment *(Marschall, 2006)*. Parents need to be welcomed in school and have an active role in school activities, perhaps by paying more attention to the education of the student to engage them in school activities, depending on their skills, knowledge and expertise. Additionally, schools need to offer guidance for parents in order to help their children's homework and improve their desire for education *(Jordan et al. , 2008)*. Supporting the learner's experiences by their families has a critical role

in creating the ideal social environment, where appropriate communication between families and school or educational authorities takes place *(Patrick and Ryan, 2003)*.

Peer groups and friends

The interaction between learners and their peers and friends within the school is vital. Students who socialise with their classmates remain safer from bullying and the dropout rate decreases. They maintain better progress in the school and achieve deeper understanding of their own learning *(Lubell and Vetter, 2006)*. The study conducted by *Gonzalez and Padilla (1997)* found that peer group communication in learning, along with family support, were the most important issues affecting students for greater learning progress. Thus, educators and family need to pay more attention to students who do not socialise or engage themselves well with group activity, to encourage them to participate in variety of groups in terms of gender, interests and ability, as well as enhancing their cohesion and self-confidence *(Jordan et al. , 2008)*.

The community

The community, including the families and friends that each person belongs to, plays a significant role in enhancing social cohesion and learning quality *(Patrick and Ryan, 2003)*. Each factor of social learning affects the creation of a community which can support learning by sharing and providing knowledge and experiences *(Conaty, 2002)*. The educators and learning-environment designers must consider this when designing effective learning circumstances, by building appropriate connections between the community members and their goals and desires. The learners' culture, history, tradition and rituals can thus be integrated with their learning procedures, which will gives a sense of belonging in their community *(Davis, 2000)*. In addition, encouraging the communities to debate and examine their ideas and engage in collective learning activities in school and in other learning spaces has been widely noted in the social environment literature *(Davis, 2000)*.

Equality and equity

Educators need to be aware of the opportunities that are given to the learners in terms of equality and equity within the educational system. *Lavoie (2008)* mentioned that equality means that every student must receive the same level of teaching, quality and effort to achieve

the educational goals. But each person has different sociological and psychological characteristics. Although every student may receive the same quality of education, it does not mean they receive what they need to be successful, as each student is different to others in understanding, learning, skills and interests. *Ha-Joon (2011)* states:

Equality of opportunity is not enough. Unless we create an environment where everyone is guaranteed some minimum capabilities through some guarantee of minimum income, education, and healthcare, we cannot say that we have fair competition. When some people have to run a 100 metre race with sandbags on their legs, the fact that no one is allowed to have a head start does not make the race fair. Equality of opportunity is absolutely necessary but not sufficient in building a genuinely fair and efficient society." (Ha-Joon, 2011, p.281)

In addition, *Jordan et al. (2008)* suggested that educators might promote equity and equality positively in the learning environment by respecting the all beliefs, opinions, attitudes and values of students. Additionally, focusing on learner's strengths, intelligence and paying more attention to language codes in each social group emphasises the learner's achievement and performance.

Psychological Environment

During the early stages of education, schools play a crucial role in facilitating the effective education that every student requires. The correlation between the learner's psychology and other factors such as educational, social, cultural and physical needs are important in terms of showing a clear understanding of the efficient learning environment *(Roeser et al. , 1996)*. Maslow's hierarchy of needs (see Figure 10) demonstrates that children follow six stages of development which need to be satisfied. The psychological aspects of the learners in schools, that include their identity, esteem, efficacy and expectancy performance are significant within the surrounding environmental setting quality *(Long et al. , 2011)*.
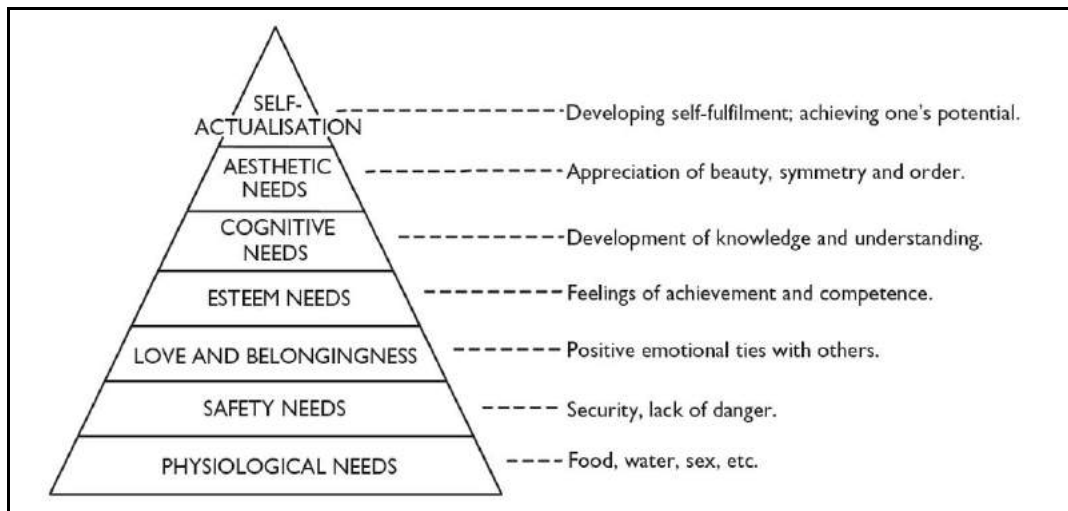
Figure 10 . Maslow's hierarchy of needs (Long et al., 2011, p.128).

Psychologists suggest the need to pay more attention to designing the physical environment as it links to the student's social interaction, which informs how the space should be used and designed to accommodate the learning process *(Trancik and Evans, 1995; Martin et al. , 2006).* The following points (shown in Figure 11), demonstrate the psychological aspects that affect the learning environment:
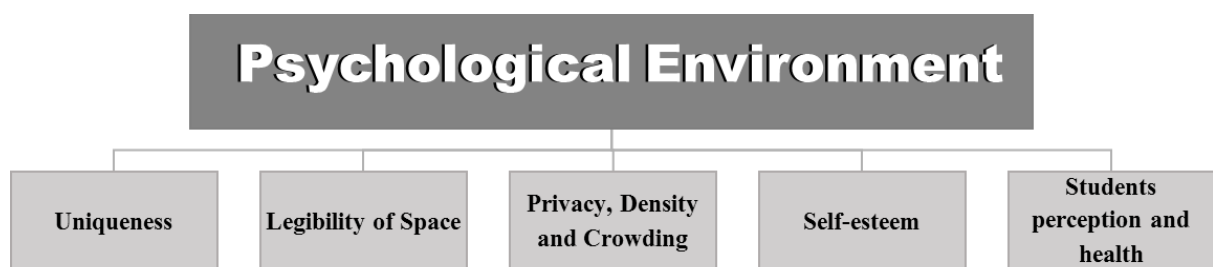
Figure 11. Psychological environment aspects.

Each student is unique

Along with the significance of 'place identity' within the social interaction, 'uniqueness' plays an important role in the psychological environment. Every individual forms his/her perception within the learning group, and leads them to identify themselves as part of the group *(Hutchinson, 2003).* However, a strong and separate sense of identity is established by developing positive expectations of psychology in formative years *(Long et al. , 2011).* To enhance a positive student identity in the learning environment, the educators have to

encourage different forms of group centred activity, friendships and interest. *Jordan et al. (2008)* suggested that isolation and integration in a different context of knowledge acquisition will support their achievements and outcomes and help them to identify their sense of self in the learning process. The social psychologist *Mead (1934)* believed that the ability to use symbols in language, and the social context in learning, is a significant psychological feature that helps society to develop their social identity via interaction with other people. That, in part, encourages each student to recognise themselves as well others.

The legibility of spaces

The 'legible environment' means the way of recognising or organising the physical space to make it functional optimally. That forms a good cognitive map for the students to be familiar with the space's environment purpose, which enhances their performance and activity. It informs students of their orientation in space and easy movement through the building *(Martin, 2004)*. Geometric form, pathways, visual access and landmarks are important in presenting a coherent building environment, which means the diversity of usual indications are effective when they are differentiated from their background settings allowing students to orient themselves easily *(Trancik and Evans, 1995)*.

Privacy, density and crowding

'Density' in this context means the physical number of people per unit of space, while 'crowding' is a psychological concept, a personal reaction based on the feeling of too little space that is not comfortable for the users. Both density and crowding affect a student's privacy, and this needs to be acknowledged *(Steele, 1973)*. Crowding results from various reasons which may be user's attitude to the space or high density. Over-crowding is a sensation that a student feels, and is subject to the effects of mood, personality, and physical context. However, density does not always create a sense of over-crowding but is affected by a variety of personal, social, and environment variables *(Ostrosky and Meadan, 2010)*.

Lack of privacy can arise from density and crowding. When students feel this lack of privacy they are usually uncomfortable in the space, and they cannot control who they come into contact with. Therefore, privacy is the capability of controlling the amount and quality of visual and auditory cues in a particular environment *(Long et al. , 2011)*.

School size and density are mentioned in many studies about how they may have impacts on learning outcomes. The density and crowding in a school affects users in relation to the social

learning environment first, and then proves to be a psychological issue. High density conditions have been found to cause aggressiveness and decreasing social interaction between students *(Moore et al. , 2003)*.

Self esteem

Long et al. (2011) demonstrates that self-esteem and self-conceptualisation for students reflects their learning attainments and outcomes and highlights those who have more confidence and capability in the learning environment, and those who are more likely to have better academic progress.

Although social constructivists suggest that self-esteem is affected by previous experiences that begin from childhood *(Bandura, 1986)*, other research indicates that self-esteem affects students' achievements, and this appears during second year of schooling - the early stages of school or primary stage *(Chapman and Tunmer, 1997)*. However, educators have the ability to enhance child self-esteem in many ways, through encouragement and this could be a critical skill that every teachers needs before embarking on a career in teaching *(Jordan et al. , 2008)*

Therefore, learners must be treated as valued individuals, not just students; each learner is different, needing to be protected from failure, sarcasm, and offensive criticism. Additionally, research shows that success comes after many 'try and fail' experiences, which needs a great attention from the teachers to provide the opportunity for students to build their confidence, with critical assessment and feedback conducted sensitively. Therefore, learning is a socialisation process that is motivated strongly with a self-esteem aspect *(Caro, 2008)* and the learning environment has to support that.

Student's perception

The perception of students is influenced by many variables, like the school's physical condition, teachers' support, violence at the school, family cohesion and parents' education, as well as personal interest and receptiveness to encouragement in education. A research conducted for Portuguese students at school and home by *Veiga (2001),* concluded that students who received less attention in their school setting and home contexts were perceived as less important. Therefore, considering the students' rights in school and home is crucial to promote the social elements of schooling. *Grace et al. (2012)* pointed out the parents'

engagement and encouragement in their children's education has a powerful effect on their levels of achievement.

There is also critical evidence that poor housing conditions and students' health have a direct impact on a student performance and development at school *(Harker, 2007)*. *Hanscombe et al. (2011)* places emphasis on the association between chaotic home life and poor performance in school, which clearly shows the connection between children and their environment in term of students perception.

Cultural environment

Each person shapes their lives and routines according to their beliefs, practice, customs, history and behaviours. Cultural aspects can influence the student's development, personalities and ideologies in certain circumstances *(Schwartz et al. , 1992)*. The understanding of the cultural variations in terms of integrating human behaviour and psychology is important, especially in learning *(Wilmshurst, 2005)*.

The concept of culture in this context refers to a theory by Thomas Stearns Eliot (1888 – 1965). This theory defines culture as that which makes life more valued, as well as defending the people and properties in an appropriate manner worthwhile to civilization *(Eliot, 1968)*. This definition focuses on the role of cultural concerns and on environment users. However, *Wilmshurst (2005)* defined the term 'culture' as *"the values, beliefs, and practices that represent a given ethno-cultural group" (Wilmshurst, 2005 ,p.241)*. While *Jordan et al. (2008)* describe it in more detail as *"a fuzzy set of attitudes, beliefs, behavioural norms, and basic assumptions and values that are shared by a group of people, and that influence each members behaviour and his/her interpretations of the meaning of other people's behaviour." (Jordan et al. , 2008 ,p.83)*. Therefore, the explicit and implicit nature of the term culture commonly focuses on the particular concerns of people within particular location or environment; these concerns critically influence the learning and development quality as it directly affects the learners psychology *(Wilmshurst, 2005)*. The following section illustrates the cultural aspect that affect learning environment, shown in Figure 12.
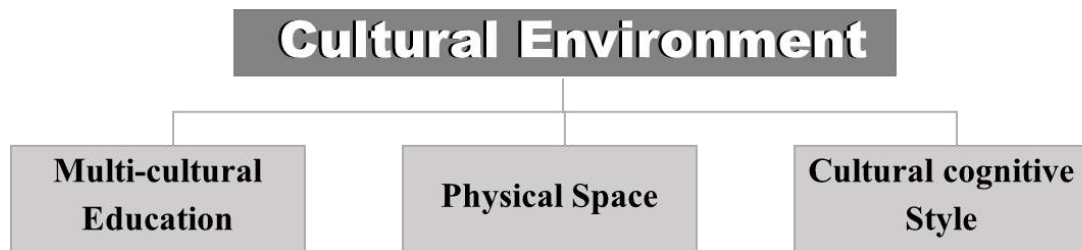
Figure 12. The cultural environment aspects

Cultural cognitive style

Human development is a series of stages reflecting many frameworks and disciplines that occur throughout life. The cognitive styles of students is one of the core theories based on three core factors: the individual characteristic, environmental, and social and economic contexts *(Bronfenbrenner, 1986). Wilks (2010)* confirms that educators who apply the constructivist approaches to learning construct the knowledge within the socio-cultural context, which means that the education and learning occurs via interaction between learners, which crucially brings the cultural factors to the fore. *Wilmshurst (2005)* emphasises the cultural environment as a significant factor in children's development that takes into account understanding the contextual variable of cultural environment on learning. *Dudek (2005)* confirms that school facilities and features are infrequently used as cultural communication spaces, for instance schoolyards should reflect the diverse cultures present within schools.

Physical space

As discussed earlier, the school environment is influenced by numerous factors like pedagogical, curricular, and socio-cultural factors *(Higgins et al. , 2005).* The cultural issues are part of the three measurable building performance criteria which focus on school users' interactions in relation with the built environment, which is mentioned by *Qun Zuo (2010)* as follows:

1- Health, safety and security performance,

2 - Functional, efficiency and work performance,

3 - Psychological, social, cultural and aesthetic performance.

Multi-cultural education

An educational authority usually aims to effectively engage students in education through providing a multicultural learning environment that each culture respects and takes into account. *Jordan et al. (2008)* suggested that educators must consider the students' cultural background in the learning environment, through understanding the ways that students construct knowledge and recognise their surrounding environment according to their cultural values. The education system should consider all cultural diversity, although many papers recommend that each school permits the variety of cultural identities to be expressed within the school areas and activities, but must avoid allowing particular cultural obsessions (a mono-culture) to take over a school *(Dudek, 2005)*. Other research shows that all the cultural identities must be considered in equally (without bias or focus), if students are to gain knowledge in an unfamiliar cultural system, otherwise there would inevitably be tension. Therefore, accommodating just one cultural identity in schools might not respect all students, which needs a careful awareness of multicultural education to be provided for each students, in order to feel sense of the belonging in the learning environment *(Jordan et al. , 2008)*.

Teaching environment

The sociological, psychological and cultural aspects within the learning environment are emphasised on the general school users' interaction and behaviour, while the teaching aspect focuses on the quality of teaching performance. As the students are at the focus of the teachers' profession, the current literature on teaching and the learning environment pays particular attention to the term of 'effective learning environment' *(OECD, 2009; Earthman, 2002b)*. The teaching environment is a critical part of the effectiveness and performance of teachers' practice in education; *Frith and Whitehouse (2009)* stated that:

> *"The child at the centre of work and the environment is made evident in the proportions of the spaces and furniture, and the detailing of work settings including the drama space, lounge, games area, studio/laboratory, classroom workshop, quiet study areas, multi-media hub, areas for group discussion and targeted teaching as well as carpeted floor areas for construction, play and socialising. Within these diverse yet integrated settings teachers operate as fluid teams guiding children's journeys of inquiry and discovery. The aesthetic*

language of materials, colour, texture, form, space and light is stylishly contemporary" (Frith and Whitehouse, 2009 ,p.98).

Several studies have revealed that theories of the teaching environment have been discussed from two perspectives. *Barber and Mourshed (2007a)* refer to 'the teaching and educational system crucial to learning', emphasising the educational factors like teaching skills, curriculum, organisation, technologies and students' capacity. They focus more on the teacher's characteristics as the core elements in providing the optimal educational system which is based on three important issues:

1- Choosing the right people to be teachers,
2- Developing and improving their skills to be effective instructors,
3- Providing strong system to deliver the best possible support for all students.

Salama (2009) accepted the above factors and although did not ignore the importance of the teaching and educational systems quality, pays more attention to the quality of the physical learning environment as an important aspect. The following section highlights the first point of view.

Effective teaching environment

Over the past twenty years, the development of educational systems, including the physical environment, has drawn attention from educational authorities and educators, who have become more aware of new approaches to learning and teaching. They advise teachers to apply variety of methods and techniques that could improve the overall experience of teaching practice and build a successful teaching environment *(Hoy and Miskel, 2013)*. As shown in Figure 13, *Hutchinson (2003)* illustrates how the the educational environment leads learning. Two factors affect the educational environment; first is the course and curriculum that are the educational factors: styles, aims, objective, and assessments. Second are teachers, supervisors and facilitators which reflect the physical environment, enthusiasm and teaching style. Moreover, student's previous experience, motivation and learning style enhance the effective learning performance.
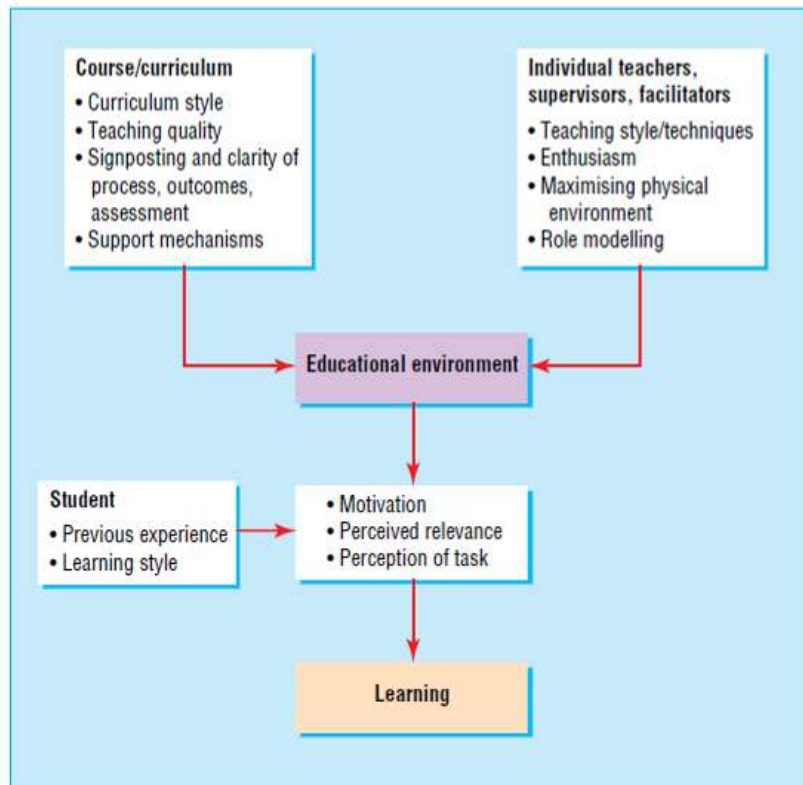
Figure 13. Educational factors that influence learning (Hutchinson, 2003)

Cotterill (2013) claims that the problem with the old approach of learning, 'teacher-centred learning', is no longer suitable, since many current pedagogical researches have emphasised that traditional lectures and workshops do not enliven the development of an effective learning environment. Some literature indicates that the essential rights of teachers have been ignored, and they have been forced to work in overcrowded and non-functional educational spaces which obstruct their teaching abilities *(Dudek, 2005).* This emphasises that providing an optimal working environment for teachers is vital, to encourage them to be more effectives in teaching, Martin stated that *"It is necessary to find ways to give teachers greater authority in designing and redesigning the spaces in which they teach. The implications of this should be recognised directly in teacher training and in teacher's professional development in term of enhancing their environment awareness." (Martin et al. , 2006 ,p.87).*

Consequently, it can be concluded that there is a variation of qualities and outcomes between educational systems, which is based on variable characteristics and awareness; these need to be studied further and in more depth by the educational authorities *(Rutter, 1979).* The following section demonstrates the teaching aspects that affects the learning environment as shown in Figure 14.
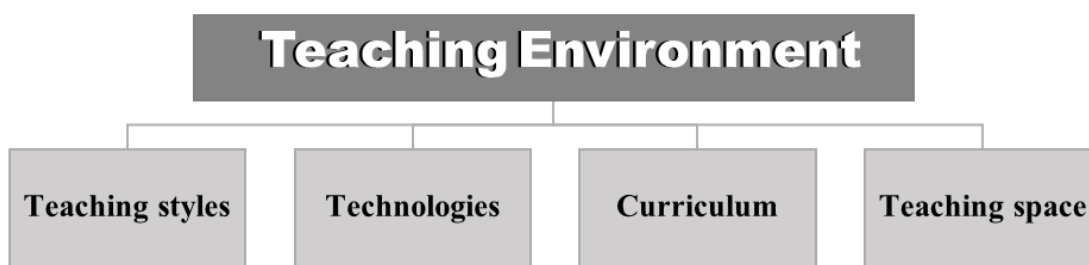
Figure 14 The teaching environment aspects

Teaching styles

Clearly-organised and engaging styles of teaching with well-prepared and experienced teachers are essential in the classroom *(Brophy, 1983)*. Many case studies have examined the most-appropriate approaches to teaching. These show that the teacher-centred learning and student-centred instruction methods are the most-effective teaching styles *(Hativa and Birenbaum, 2000).Cotterill (2013)* opinion was quite similar to *Hativa's* point of view, however, he added that focusing only on lectures and seminars based on the teacher-centered learning approach does not reflect students' teaching preferences, as students' attention and motivation require a variety of teaching styles to influence their senses. Therefore, the student-centred instruction technique is a more appropriate style for learning, since it is based on a variety of approaches.

On the other hand, *Rutter (1979)* investigated the preferred teaching styles of students within twelve London secondary schools. He found that students who had been taught using formal styles had greater levels of achievement than students who had been taught by informal styles, particularly in some subject areas like mathematics, literacy and sciences. Therefore, different topics require different teaching styles; this indicates that not enough research has yet been reported in literature. *Wolff* writes mainly about the appropriate teaching styles that influence the students most effectively; he states that *"The need for more active learning processes included pedagogical strategies such as (a) collaborative learning, (b) cooperative learning, (c) learning communities, (d) interdisciplinary seminars, (e) integrated learning, (f) project-based learning, (g) work-based learning, and (h) community-based learning. Educational institutions need to provide programs in which learners learn to think and become participants in the larger world." (Wolff, 2003 ,p.14)*

Technologies

To date, several studies have suggested that using more technology to facilitate learning is important. Students are more willing to experience learning with the advantage of Information, Communication and Technology resources (ICT). *Cotterill (2013)* addressed that teaching aids are features of modern society, computers, projectors, internet and networks are essential in today education. This requires critical attention in the teaching environment *(Higgins et al. , 2005;Wilks, 2010).* Conversely, *Lippman (2010a)* and *Weiss (2007)* both reported that introducing ICT facilities into current educational systems does not always work as expected, and could be unsuccessful to some extent. They accredit these failures to three causes. a) The physical design setting was not applicable with the integration of technology; the learning environment should be designed and planned alongside the technologies to enhance the intended learning activities. b) Most of the technology aids like whiteboards and projectors promoted only peripheral attention, which also strengthens a teacher-centred learning. c) The widespread awareness within the educational authorities and communities is not flexible or interested with this change, as technologies must be applied within teaching and have benefits and disadvantages.

Curriculum

The curriculum is what is intended to be taught to the students: the set of ideas, theories and knowledge about variety of subject areas. Usually a curriculum is formulated as an activity- and experience-based strategy that attracts the students' attention, not only as a list of knowledge and facts that must be remembered *(Matheson, 2014)*. *Pearlman (2010)* argues that the purpose of contemporary ,21st century, learning is to engage students via improved pedagogy and projects, based on a well-designed curriculum, as well as performance assessments. *Tomlinson (2004)* states that a curriculum has to be organised around categories and concepts in order to have meaning for the students, in which learning is a mental process that links an unfamiliar concept to more familiar ones. Teachers have to create abundant opportunities to support students linking new ideas with old. Therefore, educational authorities have to encourage teachers to apply new strategies in their curriculum and teaching practices, in order to make links that enhance the educational context for all students *(OECD, 2009)*.

Teaching space

Providing the optimal environment is an important factor in reaching optimal performance and activity. A conference group *(EDUCAUSE, 2004)* concluded that an educational point of view that changes the teaching environment settings and structures will also direct changes in teaching styles and vice versa. The curriculum and teaching styles are important in that the space settings should not excluded from these factors in order to improve the quality of education. *Earthman (2002)* maintained that view and added that any improvement and changes in the physical learning environment will greatly affect the quality of teaching and learning, because poor school settings reduce the efficiency of teachers and also impact upon the students learning. *Salama (2009)* highlights "*the need to utilize knowledge generated from research findings into school design process, to pursue active roles in sensitizing users about the value of the school environment in reaching the desired academic performance while increasing teachers' productivity.*" *(Salama, 2009 ,p.4)* The physical circumstances that impact on teaching and learning environment are the core of the present research, and are expanded later in the literature review.

Physical Environment

As explained earlier, the previously discussed four factors are classified as the non-physical environment factors which relate to the students' and teachers' interaction and performance within the school. All these factors are influenced by the quality of the physical learning environment. A brief description of the physical environment is presented in this section and then expanded later in this chapter.

Research within a variety of fields shows that the balance of students' perceptions in different classroom settings can affect their academic achievements and interaction *(LaRocque, 2008; Veltri et al. , 2006).* Educators, psychologists and architects and designers stress that the classroom environment has a power to facilitate and enhance the learning process. *Kopec (2006)* stated that "*researchers confirm that the design of physical environments will affect children's perception, learning and behaviours. As expert who found that early development of motivation, cognition, and social skills can be supported by the design of children's play spaces*"*(Kopec, 2006, p.189). Allen and Hessick (2011)* referred to the physical environment

in the classroom as the 'silent curriculum', an essential factor leading to the optimal education and learning experience. Students are influenced by their classroom environment even if they do not understand the implication of the environmental settings on learning. The following aspects shown in Figure 15 are the physical factors relevant here.
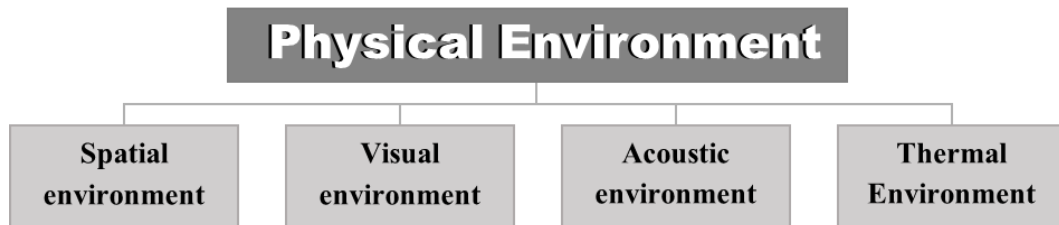
Figure 15 The physical environment factors

Spatial environment

The spatial formation of the classroom is important; linking the spatial environment factors with the quality of learning and outcomes is crucial and much literature discusses this in depth *(Newton et al. , 2009)*. These spatial factors are divided into three elements as follows:

1. Function of the space: The spatial organisation setting enables functions and purpose to be taken into account to use the space properly *(Bonus and Riordan, 1998)*. In order to help students internalise learning with the pedagogical system or other philosophical approach, the purpose of the classroom and learning environment must be specified and understood well by the teachers and all school users *(Taylor and Enggass, 2009)*.

2. Seating arrangements: Providing flexible seating arrangements enables a diversity of learning activities to take place *(Maxwell, 2010)*. Teachers can organise the furniture in rows, cooperative groups or clusters, depending on their teaching strategy and the particular function of the space that is required *(Moore and Lackney, 1993)*.

3. Density: The human psychological behavioural reaction to crowding is also important. It has been suggested that a low-density environment encourages more participation and positive attitudes, as well as creating a sense of friendship and greater academic achievement *(Newton et al. , 2009)*.

Visual Environment

The psychological studies show that there are positive relationships between the visual elements and the students' behaviour, which improves the quality of the teaching and learning environment *(Lippman, 2010b)*. Three main elements are important in the visual environment:

1) **Lighting.** Studies show that appropriate lighting enhances academic achievement and reduces negative aspects of off-task behaviour, while incandescent lighting is more appropriate in learning environments due to its positive impact on students *(Sleeman and Rockwell, 1981)*.

2) **Colours.** This can influence students' mood, judgment and behaviour. Each colour has different behavioural implications and psychological effects, so designers are advised to use cold or warm colour palettes in a learning environment, depending on the activities that will take place in them *(Allen and Hessick, 2011)*.

3) **Personal displays.** Exhibiting the students' works in the learning environment is an important feature that can impact on students' behaviour and sense of belonging, which has been stated as a crucial element in the physical environment *(Pearlman, 2010)*.

Acoustic Environment

Acoustic quality in a classroom improves the ability of students' learning. The teacher's voice, for example, has to be audible to all students in the classroom *(Klatte et al. , 2010b)*. External noises that affect the classroom like airplanes and road traffic must also be kept to a minimum *(Bronzaft and McCarthy, 1975)*. Internal noises like students' movements and voices are also a significant concern for the designer *(Promethean Education Strategy Group, 2014)*. Research shows that the reading achievement grades for schools that are located in quiet areas were considerable higher than achieved by students in noisy schools *(Earthman, 2002a)*.

Thermal environment

The thermal quality has an impact on learning; the temperature in learning spaces affects students' behaviour and achievement *(Harmon, 1953)*. Each student has different expectations of an ideal thermal environment. High temperatures as well as low ones in classrooms can decrease students' achievement of class tasks *(Shield and Dockrell, 2004)*. The ideal temperature depends on the climate condition in each country, and student's preferences

which also vary; therefore, students and teachers need to be able to control the classroom temperature during class time *(Teli et al. , 2012)*.

Summary

In all the studies reviewed here, the impact of the learning environment on users is influenced by five main themes: social, psychological, cultural, teaching and physical. These themes can be analysed according to many factors that have an impact on the user's behaviour and performance. For the purposes of the present research, the focus is the physical learning environment, although it is recognised that each non-physical environment component contributes to the overall quality of learning environment. Therefore, all the factors that affect the learning environment are reviewed in the following sections to enrich the present research. The next section describes the theoretical background about developing and assessing the quality of physical learning environment.

3.4 Development and assessment of the physical learning environment

Measuring the functional quality of the space, and how the learning environment is experienced, and what facilities and considerations are taken into account are fundamental for designing a successful learning environment *(Roberts, 2009)*. These have been summarised according to three different groups:

- The educationalists, who are concerned with providing an effective environment suited to their policy and purposes, and which also suits the educational and teaching systems used in the school *(Smith, 2003a)*.
- The designers and architects, who pay attention to the quality of the physical learning environment and settings depending on the educators' brief and guidelines, and how the school users function, move, interact, and participate in the environment *(Dudek, 2012)*.

- The environmental psychologists, who highlight the specific features of physical settings which have an impact on users' behaviour, outcomes and achievements *(Lawson, 2012)*.

The following section briefly discuss and clarifies these three groups' concerns about the physical learning environment, to identify the main issues that hinder the development of the best possible learning environment to reach a meaningful conclusion.

Educationalist perspectives

Educators are mostly concerned with modifying and developing the pedagogical system and curriculum to identify the most appropriate style of learning. Their first concern is the curriculum - what should be taught - and the practices that the educational authorities plan to deliver to learners. The second area is pedagogy, which refers to the methods that the content will be taught, and the ways of teaching and conveying information to the pupils. These two foci are fundamentally linked to each other, so that the quality of the curriculum will be seriously affected by the quality of the teaching and pedagogy, and vice versa *(Allen and Hessick, 2011; Barber and Mourshed, 2007a; Carr, 1979; Wolff, 2003)*.

In traditional teaching methods, that used the 'dictation' style of teaching, the teacher's role was the centre of the learning system, with less attention being paid to the learners' levels of engagement and motivation *(Rowntree, 1998)*. This teaching style still exists in most Kuwaiti public schools and in some other counties as well *(Mahgoub, 2009; Al-Enezi, 2002)*. The recent arguments between educators, scientists and philosophers show an increasing rejection of the effectiveness of the dictation teaching method, preferring a move towards emphasising the enhancement of the students' characteristics and motivation *(Hativa and Birenbaum, 2000)*.

Sir Kenneth Robinson's (1950) claims that providing an open learning system that is not controlled by an official educational authority is crucial; the teaching system could then be determined completely or partly outside the educational authority pattern. With more-flexible learning opportunities, approaches and methods without any instruction, students can control their own education without continual supervision. This assumes that students grow better with a broad curriculum in which they may discover hidden skills in the areas that interest

them. It also recommends teachers take responsibility not just for delivering information by teaching itself, but also for engaging and stimulating the interest of students through learning environment, as the education is based on learning, not teaching *(Robinson, 2006)*.

Another theory developed by Sugata Mitra (1952) suggests offering students more freedom to learn through self-organised systems that give them the opportunity to choose how they want to learn. This approach might be undertaken by providing them with materials without any instruction, which leads students to find their own way to achieve their learning, and will direct them to be learners without teaching *(Mitra, 2010)*.

Colin Powell's (1937) view recommended to improve the exciting educational system, in order to develop students who have the ability, drive and skills as a foundation for their future life and career. By promoting and improving the structured learning system that stresses supervision and management by teachers and educators. This approach is similar to the existing system used by many educational authorities, but Powell stresses *ability* and significant developments needed *(Powell, 2012)*.

Consequently, these views highlight the educational strategy and what students value, while the physical environment has received less attention in the literature. Each view requires different settings and arrangements which must be in place by the environment designers to create the most effective environment that suits the particular approach *(Carr, 1979; Smith, 2003)*.

Designers' and architects' perspective

"The ways in which children perceive their surroundings greatly affect how they will perform"(Allen and Hessick, 2011, p.7).

This group concentrates on the physical setting and function of the learning environment. *Frith (2011)* assumes that less attention has been paid to the impact of interior and architectural aspects in school design, which are still under teachers' and educators' responsibility to control as they perceive best. Recent studies have proved that the interrelationship between pedagogy and space has been clearly identified, which leads to more attention being paid to the physical learning environment *(Newton et al. , 2009)* .

Children are aware of their classroom environment even if they do not understand the implication of the environmental settings surrounding them *(Dudek, 2005). Wolff (2003)*

mentions that the excellence of learning performance is based on many disciplines, like teaching style, curriculum, including the quality of physical settings. The physical environment itself will not affect the quality of learning experiences if not combined with the other disciplines. Research shows the students' perceptions of their physical environment quality in classroom settings affect their academic achievements and interactive quality *(LaRocque, 2008)*. Involving interior designers and architects in creating spaces that motivate and inspire the students and teachers is significant.

Creative, bespoke, motivational and effective spaces have been introduced within office-design projects; these projects intend to enhance the staff's abilities through their physical environment to work effectively, more productivity and sometimes to be conducive to creating powerful and innovative ideas. The JWT Amsterdam office, for example, has been designed with the intention of inspiring and creating new ideas (see Figure 16). Provision of a variety of meeting points, visual stimuli, and effective arrangements and facilities that are needed, like technology and a library, were important to motivate their workers *(Williams, 2013)*. This case has shown that a creative environment can enhance the motivation, creativity and performance of the space users; this vision could be applied in the learning environment to improve learning and teaching performance.

Figure 16: JWT Amsterdam office *(Williams, 2013)*.

The following points are the key issues that architects and designers need to consider in designing learning environments, as discussed by *Frith (2011)*:

- Flexible structures and services in physical settings, which allow students and teachers to shape their environment to suit their needs (e.g. moveable furniture).

- Unique design features, which refer to the philosophical vision of design and architecture, which imbues each school with an identity different from others in terms of design, layout, and patterns.

- Richness and variety of spaces, which provide a diverse selection of areas with different scales, colours, equipment, lighting, floors, textures and so on. These facilities enhance students' creativity and motivation to learn, in a way similar to the JWT offices (see Figure 16).

- Collaboration with the community, which means engaging the teachers, students and staff in the design process to create a balance between purposeful design and flexibility which supports the users' needs.

Environmental psychologists' perspective

The users' behaviour and attitude in their learning environment can be correlated with the environmental psychological perspective *(Hirschy and Wilson, 2002)*. Both educators' and designers' views are linked to this perspective, which means that the psychological considerations in the learning environment play a fundamental role in the present research. Psychologists and behavioural scientists began their research into the relationships between the environment and human behaviour in the early 1950s. This has accelerated, with different research terms used, such as 'architectural psychology', 'human environmental studies', 'socio-physical technology', and the most common current term, 'environmental behaviour studies' *(Martin et al. , 2006)*.

This perspective refers to the interdisciplinary reaction between space users and their surrounding environment, and the types of relationships that affect the spaces users in relation to their environmental features. *Saelens and Handy (2008)* carried out an empirical investigation into the built environment and physical activity, leading to recommendations on how to enhance the school users' reactions and behaviour in their environment, which in turn are related to their achievement. It can impact upon the comfort, happiness and satisfaction of

the students within it, which affects their progress, motivation, performance and quality of life, including their education and learning.

A school's location can be related to the quality of the built environment. If a school site is located within a relatively close distance from students' homes, it will reassure parents and encourages students to walk or cycle to school. That has been proved to have a positive impact on their activity and performance, and which clearly impacts on the students' behaviour *(Tester, 2009)*. Moreover, linking school design with cultural traditions is also crucial, as students see a variety of familiar symbols and patterns across schools and deduce meaning from them. Therefore, schoolyards and physical spaces could be used as cultural and psychological communication symbols to the community at large *(Dudek, 2005)*.

The psychological impact of the physical environment on learners

Studies indicate that attracting the student's attention and activities in the learning process would lead to better leaning performance and motivate and influence students' efficiency *(Wittrock, 1992)*. *Biggs (2011)* illustrated two factors which affect human activity and learning: first is the attention and concentration of students based on their mental arousal that increases adrenalin and alertness. The second factor is the academic objective of gaining knowledge, which students acquire after their attention has been gained. *Biggs* also stated that *"We learn through different sense modalities, and the more one modality reinforces another, the more effective the learning. It is like trying to access a book in a library. If all you know is the author, or the title, or the publisher…. you could be in for a long search, but the more information you have, the faster and more precise the search becomes."(Biggs, 2011, p.80)*

Therefore, the learning process and the learning environment have a relationship with the learner's psychological senses. *Tulving (1985)* confirms that students learn through a variety of senses like vision, hearing and touch; the impact of some senses is more effective that other senses, a fact which needs to be considered in the learning environment. *Tulving* stated that three memory systems are used by students:

- Procedural memory, actions and activity that achieved.
- Episodic memory, the places and visual images that are learned.
- Sematic memory, meaning and context of things that knowledge been learned.

10%	of what they read
20%	of what they hear
30%	of what they see
50%	of what they see and hear
70%	of what they talk over with others
80%	of what they use and do in real life
95%	of what they teach someone else

Source. Attributed to William Glasser; quoted by *Association for Supervision & Curriculum Development Guide 1988*

Figure 17. The methods by which we learn by percentages: the effective ways that students use to learn *(Biggs and Tang, 2011, P.63)*

Figure 17 shows the different ways that influence the quality of learning, clearly relating to the student's perspective. Some senses are more efficient than others, when more are involved, there are greater learning benefits *(Biggs and Tang, 2011). Taylor and Enggass (2009)* claimed that the environmental design structure acts as a 'silent curriculum' which affects the students' performance and has the power to enhance learning alongside with curriculum and pedagogy systems, as described above.

Kopec (2006) gave extensive information about how children gain a great deal of knowledge and experience from their learning environment. He confirms that the main purpose of the physical learning environment is to enhance the psychological modes of human understanding. *Lippman (2010a)* shows that the physical learning environment in the 21st century aims to re-organise and support the learners' self-directed- and cooperative-learning approaches, where it is planned as a mediating learning tool. Both Kopec and Lippman identified the physical learning environment as the facility that improves and enhances the learning experience. However, Kopec expanded his discussion about the psychological modes of human understanding by emphasising that the purpose of the learning environment is to support the human cognitive skills through three modes as the learners could be categories within these three modes *(Kopec, 2006)*:

- Visual learners, who learn from what they see and think like picture and film.
- Auditory learners, who process the information from what they hear and listen, like hearing the lectures and discussion.
- Kinaesthetic learners, who learn from doing physical activities like touching, drawing and sports activity.

Kopec emphasises that students learn more efficiently when these three modes are employed, a view similar to *Biggs and Tang (2011),* who mentioned involving multiple senses in learning. Therefore, understanding how learners obtain knowledge is important for school designers to customise the learning environment that suits the educational goals. The learning environment impacts on the human senses which certainly affects their behaviour, performance and motivation though both of physical and social factors *(Higgins et al. , 2005).* The environment can function as a learning instrument, based on the learner's needs and requirements.

Summary

The assessment and development of effective learning environments are based on the perspective of three groups: educators, designers and psychologists. Each has concerns that affect the whole quality of learning environment. The present review indicates a lack of cooperation between these groups, in that each one focuses on selective aspects that concern them, while ignoring aspects that they consider to be not relevant. This can lead to a disaggregation of the ideas, and gaps in holistic thinking, concerning the conceptualisation of the ideal physical learning environment.

The groups' different priorities are not often taken into account equally: the power or authority of one group can dominate the others. The decision makers in the educational authorities are usually controlled by educators, while the designers' and psychologists' thoughts carry less weight. This situation seems to exist in the current education systems in Kuwait *(Al-Enezi, 2002).* Therefore, to provide an effective learning environment, it is necessary to enhance the cooperation between these three groups equally. Each group aims to build a strong strategy to develop and evaluate the learning environment effectively.

3.5 Evidence-based research of the physical learning environment

Studies show that effective learning is not based just on the acquisition of knowledge, but through influence and engagement with the user's skills, abilities and behaviour *(Smith, 2003b; Carr, 1979). Allen and Hessick (2011)* argue that the physical environment has a power to facilitate and enhance the learning process. *Martin (2004)* notes that the impact of physical learning environment on behaviour is critically important. However, the crucial challenge is to understand these impacts in terms of the quality of space and environment (see Table 3). Many of these lines of evidence came from non-design-based research fields, like anthropology, geography, political science, psychology and sociology, which could be researched further.

Table 3. Learning modes (Kopec, 2006, P.190)

MODE OF LEARNING	METHOD OF INVOLVEMENT	IMPLICATION FOR DESIGN
Reading and hearing words	Auditory receiving	Ensure noise control and proper classroom acoustics.
Looking at pictures or watching a demonstration, movie, or exhibit	Visual receiving	Provide multimedia, posters, paintings, and drawings of significance and visual penetration.
Participation in a discussion	Kinesthetic receiving	Use semicircular seating arrangements and include features that facilitate small group discussions.
Simulating the real thing	Kinesthetic receiving	Provide laboratory space.

Therefore, the physical features of the learning space can have direct impacts on students and teachers' behaviour, interactions, attention, motivation, and productivity *(Kopec, 2006)*. This section illustrates the evidence-based researches about the five factors in physical environment: the spatial environment, the visual environment, acoustics, the thermal environment and the personal environment *(LaRocque, 2008)*. These five factors are discussed in depth below.

Spatial environment

The organisation of physical space setting and its impacts on learning and teaching performance is a core focus. As shown in Figure 18, four aspects are space function, seating arrangements, density of students, and then circulation and movement of student and teachers.
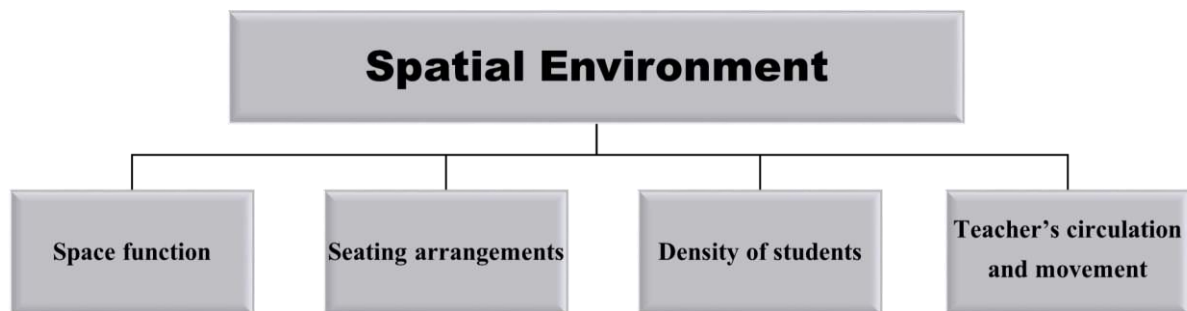
Figure 18. Spatial environment factors

Space function:

> *"Just as different learning goals require different learning strategies, different instructional strategies require different learning spaces"(Taylor and Enggass, 2009, p.18).*

Frith and Whitehouse (2009) discuss the 'functionalism theory', which means that the starting point for designing any space must begin by examining the human needs and experience, which include social, cultural, psychological and other factors. While *Moholy-Nagy (1947)* theorised that design must be functional: '*Function is not only a demand for a limited mechanical task; "function" also includes the fulfilment of biological, psychological and sociological requirements'(Moholy-Nagy, 1947 ,p.44).*

The learning environment has its own function designed to provide an effective environment that leads to education and learning *(Weinstein and David, 1987).* Functionalising the space and effective layouts are crucial cohesive criteria for the classroom users. Where a whiteboard could be focal, other boundaries such as flooring and ceiling design, textures and colours can affect classroom activity and the nature of pathways directing the users from one place to another can be important. Visually, objects on display within the classroom and school

environment show what is going on in the space and aim to keep the environment coherent *(Dudek, 2005)*.

Educationalists also stress that the optimal way to design the environment is intended to suit the teachers' requirements and the pedagogy system. Additionally, understanding the ways that student's gain knowledge effectively is crucial as well in designing learning environment. *Wittrock (1992)* proved that the brain has various pathways to obtain diverse areas of knowledge; this depends on the differences between each student and is affected by their psychological and sociological background. These considerations require a diverse and flexible learning environment that satisfies mental processes. *Caine and Caine (1991)* stressed that providing an effective learning strategy that allows positive project-based and teamwork, as well as designing space to foster and support the students' mind, means that all the spatial settings and furniture have to be flexible, movable and fit for purpose with appropriate IT equipment.

The Montessori teaching philosophy emphasises the spatial function as a significant factor. *Lillard* stated that in regard to Montessori ideas about space *"the underlying structure and order of the universe must be reflected in the classroom if the child is to internalize it"* *(Lillard, 2005 p.56)*. Therefore, the spatial function must help the children's ideas of conceptual order and foster engagement with learning materials. Montessori philosophy also incorporates the use of large open floor spaces to generate movement in the space and cut disruptive behaviours. The Reggio Emilia approach to learning is in harmony with Montessori's ideas which called the classroom environment a 'third teacher'. The approach is based on providing plenty of space for classroom supplies, rearranging the furniture to draw attention to the environment, as well as providing large and small group activities and appropriate space foci for a variety of that activities which engage students attention to learning *(Strong-Wilson and Ellis, 2007)*.

Allen and Hessick stated that, *"The environment constantly changes like a living organism to adjust to the current tool that is needed to inform and engage the learner" (Allen and Hessick, 2011, p.11)*. The physical environment within a classroom gives a message to the students of what is to be expected in the environment, and how the strategic arrangement of classroom enhances the function of the space. *Proshansky and Wolfe (1974)* emphasised that disruptive behaviour between students in the classroom can occur simply as a result of how the room is arranged.

Martin (2004) draws on an extensive range of evidences to classify the obvious functions for the classroom and learning environment: the crucial function of the school is to educate the students. Educating students is not just teaching them the variety of subject areas and knowledge like literacy, maths and arts theoretically, it also involves social and cultural values. Developing their skills and experience for their future and adulthood is also crucial for students.

Seating arrangements

There are generally three types of seating arrangement in the classroom:

1. **Rows :** Row seating is the traditional standard arrangement considered by teachers, thought to provide an effective classroom environment resulting in more on-task behaviour *(Eash, 2005)*. This type of seating arrangement supports teachers who are delivering the verbal and non-verbal cues to the students in close proximity while controlling positive classroom behaviour *(Haghighi and Jusan, 2012).* However, it is argued that children seated in the front row often appear more attentive and less disruptive than their peers in the back, due the distance between the teachers and students where there is less sense of monitoring *(Schwebel and Cherlin, 1972).*

2. **Clusters**: This arrangement is preferred in modern schools; students sit in small groups of three or four peers around one table. *Papalia (1994)* reports that cluster arrangements could enhance collaboration activity, tutoring, problem solving, teaching, peer teaching and groups games. It is also argued that cluster arrangements facilitate social interaction between the group but impede individual work and is not suitable for exams and formal assessment exercises *(Bonus and Riordan, 1998).*

3. **Cooperative arrangement:** This is the circle or U-shape, a larger scale of cluster-type seating where students seat around the teacher. This arrangement increases social interaction encouraging students discussion and work together which is not possible in row arrangements *(Simmons et al. , 2015)*. Teachers have noticed that this cooperative arrangement not only encourages interaction among students, but also between teachers and students, which has positive effects on learning *(Bonus and Riordan, 1998).*

Studies on the relationship between the seating arrangement and academic achievements reveals that there is a strong correlation between the two. However, these studies also show there is no particular seating arrangement that works positively universally in the classroom, and seating should be arranged according to the teachers' preferences, lesson style and student abilities for better outcomes *(Bonus and Riordan, 1998;Suleman and Hussain, 2014)*. *Wannarka and Ruhl (2008)* state that "*The majority of the studies sought to describe the use of seating arrangements to minimise disruptive behaviour or maximise on-task behaviour during individual activities (Wannarka and Ruhl, 2008, p.92).* Therefore, row-seating arrangements could be better in some subject areas to enhance on-task behaviours that require more didactic approaches, letting students interact with teachers more effectively than a cluster arrangement. However, cluster arrangements work better in other subjects where enhancement of the cooperative between students without direct teacher intervention is required. Consequently, educators need to consider providing a variety of seating arrangements to decrease disruptive behaviour as well as take full advantage of on-task behaviour during cluster activities.

Bonus and Riordan (1998) suggest flexible seating arrangements allow the learning instructors to change the arrangement quickly depending on the teaching style. Whereas *Allen and Hessick (2011)* recommend that providing tables for groups of students, instead of personal desks, is more efficient in the classroom in promoting cooperative learning and controlling behavioural problems:

> *"Tables allow the classroom to empower the student to own what they are learning. The "power" shifts from the teacher in front of the classroom, to placing more responsibility on the student and the table group. Tables encourage small group discussion and project-based learning"(Allen and Hessick, 2011 ,p.12).*

Optimal seating arrangements

Each type of seating arrangement has advantages and disadvantages; teachers have to consider the most appropriate arrangement for the purpose of the lesson *(Allen and Hessick, 2011)*.The ideal seating arrangement depends on the nature of learning style, objectives, teaching method, and activity being implemented which are all variables in the learning system *(Simmons et al. , 2015; Haghighi and Jusan, 2012)*. Although no papers to date have shown a universally optimal seating arrangement in the classroom, it is clear that the

teaching environment meets the needs for the students' particular activity and the teaching strategies, and so flexibility is essential *(Bonus and Riordan, 1998).*

Wannarka and Ruhl (2008) stated that *"it is important for teachers to have the knowledge necessary to make informed decisions about whether rows, clusters, semi-circles or some other arrangement will best meet the instructional needs of their students, and results of the studies suggest that the nature of the academic task and type of behaviour desired should dictate the seating arrangement. Generally, teachers who want to maximise the on-task behaviour of their students during independent work should consider utilising rows rather than groups as their primary seating arrangement and moving desks into other positions to facilitate interaction when it is desired. Researchers have pointed out the logical inconsistency of seating arrangements that seem to run counter to the nature of the academic task."(Wannarka and Ruhl, 2008, p.89).*

Density of students

Density in this regard refers to crowding, a psychological issue relating to the number of people per unit area of teaching space, *Martin* referred to overcrowding as *"a personal, subjective reaction that is based on the feeling of too little space" (Martin et al. , 2006 ,p.64).* Much evidence was found by *Lackney (1994)* who emphasised how the learning-environment size can have an impact on the learner's performance.

The measurements of the physical space size, and student density, are significant for their effects on behaviour and attitude *(Weinstein and David, 1987). Allhusen et al. (2004)* examined the impact of both large and small class sizes on students' performance. They concluded that classrooms that have less than 20 students are more likely to achieve more, attaining more social skills and feeling close to the teachers. *Earthman (2002b)* also agreed with *Lackney* and *Allhusen,* and added that student outcome levels will increase owing to students gaining more individual attention from teachers, so they are able to ask questions and interact further with the teacher. *Barber and Mourshed (2007a)* assert that having 15 students in each classroom has shown in many studies improves performance, but a reduced class size creates a resource problem as it requires more teachers and classrooms, which indicates implicitly that more funding is required in education.

Studies also have shown that high density leads to direct behavioural outcomes that influence students through lack of privacy; this hinders their ability and desire to learn *(Kopec, 2006; Long et al. , 2011).* High density of students can stimulate aggression, hostility, movement and distraction, resulting in lower academic achievement. The low-density environment suggests there is more participation, positive attitude, rise in the sense of friendship and greater academic achievements *(Moore and Lackney, 1993).* While *Gifford et al. (2011)* suggest reducing the negative effects of high density through careful environmental design, therefore a variety of zones and partitions could provide more areas for users within limited space.

Teacher's circulation and movement

The location of teachers and movement in the classroom are fundamental issues in the learning environment and classroom management *(Lim et al. , 2012).* Teachers are advised to foster positive social interaction in the classroom and engage students. *Fisher (2001)* advised the teachers to increase the students' positive interaction by paying more attention to their position and movement within the classroom. *Myers and Anderson (2010)* reported that the optimal results of teachers are indicated when they move well in classroom, and are aware of how to interact with the students within subject area; they also state that research shows that students potentially learn better when they interacting directly with the teachers.

Visual Environment

Research has indicated that those using the learning environment are influenced not only with space in which they study, but by the way they interact with their surroundings. The visual elements affect the user's experiences of the space and are worthy of greater attention, and are ranked as one of the main sources of comfort in the learning area *(Frontczak and Wargocki, 2011).* According to *Higgins et al. (2005)* visual stimulation has a psychological effect on students in mental receptivity; lighting, colour and personal element all contribute. *Lawson (2012)* agreed with *Higgins'* view and added that the visual elements not only affect students during the lesson, but also have a clear impact on students' behaviour and achievement

because they enhance their ability to understand and gain knowledge effectively. Figure 19 shows the visual factors that mentioned in this review, which are discussed below:
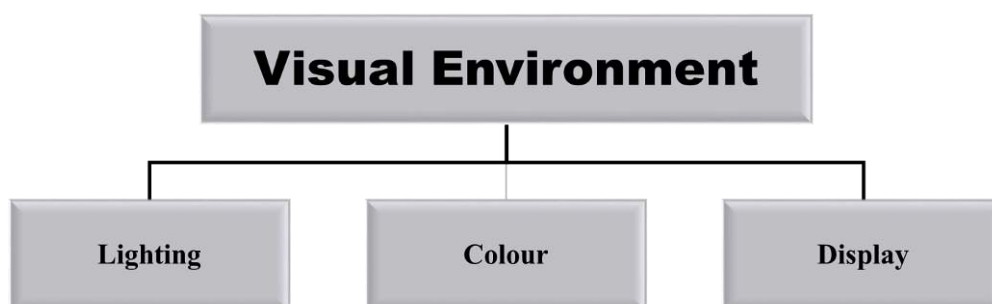
Figure 19. Visual environment factors

Lighting

Appropriate lighting enhances academic outcomes and reduces the negative situations during 'off-task' behaviour. There are two type of lighting in learning environment: natural daylight and artificial. Natural lighting has positive influence on leaners interaction and motivation *(Higgins et al. , 2005; Earthman, 2004; EDUCAUSE, 2004).*

Benya (2001) emphasises that appropriate daylighting must be supplemented with artificial lighting. The connection between these two types of lighting is important in providing the required amount of illumination in the learning areas. Research into the preferred lighting of classroom area users conducted by *Winterbottom and Wilkins (2009)* found that daylight is crucial, but some teachers preferred to retain a sense of control, dependent on their teaching styles and the amount of light they required. In addition, they suggest, in terms of artificial lighting quality, that incandescent lighting systems showed better results than fluorescent systems, since fluorescent lighting can trigger headaches and impair visual performance.

Sleeman and Rockwell (1981) illustrate that appropriate lighting is necessary in a teaching situation, and it is directly related to the type of tasks being undertaken. Students need a different lighting environment depending on the educational task at hand and the teachers have to control it sympathetically according to the task. Also, students' working areas need to avoid direct spot lights, as this causes reflected glare which is discomforting for students and affects their academic performance. While *Barnitt (2003)* suggests providing both direct and indirect lighting making huge differences in the learning spaces, this will also depend on the

purpose of the space and whether the users need direct light to work, or just overall background lighting for the whole classroom.

Lighting experts have reported that educational premises should adhere to standard values. The Zumtobel[3] lighting group is a professional company that manufactures specialist lighting for both indoor and outdoor areas and has published a reference handbook based on European lighting standards *(Zumtobel, 2013)*. This book suggests what lighting conditions suit educational buildings. Table 4 shows the required lighting levels in the classrooms that is coded as ($\bar{E}_m$), this code shows the levels of lighting by measured area (square meters). These standards have been adopted for the present research.

Table 4. The standard lighting values required for Educational Building (Zumtobel, 2013)

Educational premises		$\bar{E}_m$	UGR_L	U_o	R_a
Educational buildings	Classrooms, tutorial rooms	300	19	0.60	80
	Classrooms for evening classes and adults education	500	19	0.60	80
	Lecture halls	500	19	0.60	80
	Black, green wallboards and whiteboards	500	19	0.70	80
	Demonstration tables	500	19	0.70	80
	Art rooms	500	19	0.60	80
	Art rooms in art schools	750	19	0.70	90
	Technical drawing rooms	750	16	0.70	80
	Practical rooms and laboratories	500	19	0.60	80
	Handicraft rooms	500	19	0.60	80
	Teaching workshops	500	19	0.60	80
	Music practice rooms	300	19	0.60	80
	Computer practice rooms (menu driven)	300	19	0.60	80
	Language laboratories	300	19	0.60	80
	Preparation rooms and workshops	500	22	0.60	80
	Entrance halls	200	22	0.40	80
	Circulation areas, corridors	100	25	0.40	80
	Stairs	150	25	0.40	80
	Student common rooms and assembly halls	200	22	0.40	80
	Teachers rooms	300	19	0.60	80
	Library: bookshelves	200	19	0.60	80
	Library: reading areas	500	19	0.60	80
	Stock rooms for teaching materials	100	25	0.40	80
	Sports halls, gymnasiums, swimming pools (general use)	300	22	0.60	80
	School canteens	200	22	0.40	80
	Kitchens	500	22	0.60	80

Standard values for lighting of indoor and outdoor workplaces and sports facility lighting

Tables and figures were taken from the European standards.

"Lighting of indoor workplaces", EN 12464-1 (June 2011)

"Lighting of outdoor workplaces", EN 12464-2 (October 2007)

"Sports facility lighting", EN 12193 (April 2008)

The following limits have been specified in the tables:

Illuminance levels must not fall below the $\bar{E}_m$ maintenance values in the visual task area. If the precise location is not known, the limit should be applied to the whole room or a specific working area.

Example for an office task area:
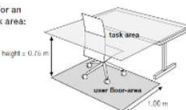
The maintenance factors can be determined on a case-by-case basis, according to the manufacturer's specifications (see also chapter 9 – Checklists).

Where no individual maintenance data is available, the following values are recommended as reference maintenance factors for modern technology and three-yearly maintenance: 0.67 in a clean atmosphere, and 0.50 in very dirty environments.

EN 12464 specifies that the lighting designer must document the maintenance factor and maintenance schedule.

UGR_L is the upper limit for direct glare. The UGR value calculated in the design process must lie below this.

Uniformity U_o is the ratio between the lowest (E_{min}) and the mean illuminance level ($\bar{E}$) in the area to be evaluated. The result is a minimum level.

R_a is the lower limit for the colour rendering index. The R_a of the selected lamp must be equal to or greater than this value.

Colour

Colour is a visual perceptual reaction to reflected light on the objects that cause the brain to recognise the certain hue psychologically. Because colour affects the students' psychological

---

3 www.zumtobel.com

reaction in terms of adequate illumination and comfort in a pleasant visual environment *(Mahnke, 1996)*. It has been associated as an important element in creating an effective learning environment. *Kopec (2006)* mentions that colours used in schools can significantly affect the student's perception and stimulation. It has also been found in the case studies that changing colours in a school had a positive influence on reducing absenteeism. *Martin (2004)* reported that texture and colour in the classroom is crucial, and could work in a functional way; for example, by dividing a space using different colours, enhancing the users' experience in the learning environment.

The theory of colour has been debated in the literature and many discussions have focused on schools and the learning environment *(Higgins et al. , 2005)*. *Mahnke (1996)* identified that vibrantly colourful or monochrome school areas are not necessarily the most ideal environment since they may cause behavioural problems, including nervousness, lack of interest and energy. Therefore, the selection of colours needs close attention, in order to enrich the positive colours and avoid the negative ones. Because colours can affect the users' mood and behaviour, *Sleeman and Rockwell (1981)* pointed out that 'warm' colours in schools seem to energise the optic nerve and increase blood pressure, which impacts the students' activity and energy; however 'cold' colours influence relaxation and peaceful behaviour.

Learning requires some of both the 'warm' and 'cool' colours for full impact, therefore, *Engelbrecht (2003)* and *Mahnke (1996)* focused on the following guidelines for the learning environment:

- Warm and bright colour schemes enhance the student's psychological ability to learn and need to be planned effectively.
- Cool colours are suitable for high school students as they improve concentration.
- The front classroom wall should have a different colour to the surrounding walls to direct the student's eyes attention to the teaching area.
- Corridors and hallways could use a variety of colours thematically to give the school a sense of 'personality'.
- Attention must be given to control the glare of reflected light to the furniture, walls and ceilings.
- Colour should be used to support the function of schools and the wide diversity of tasks proposed in the schools.

Displays

Maxwell (2000) analysed that displaying the students' work in school areas are important and enhances their experiences. Similarly *Killeen et al. (2003)* support *Maxwell's* views and mentioned that displays improve the students' motivation, involvement and sense of ownerships; these aspects actually influence the student's behaviour and improve self-esteem.

The Reggio Emilia approach purports that paying attention to the display of students work in the learning environment is significant, since it gives a message between all users of the space including students, parents, teachers and administrators, reinforcing the idea that the students work is of value *(Strong-Wilson and Ellis, 2007)*. However, *Dudek (2005)* stressed the importance of students' displays from a designs point of view, and said further that displaying students' work in some school areas, such as outside the classroom or in a prominent position, can distract their attention. Therefore, displaying the students' work in learning environment has to be planned carefully and not distract them during lessons.

The ways to display the students' works is varied, both *McGonigal (1999)* and *Killeen et al. (2003)* argue that there could be a separate personal space placed temporarily in the classroom, or a permanent space functioning as a display area for all students. In these spaces, the displays could be printed on interchanged materials, which gave a variety of positive influence to the students. *Higgins et al. (2005)* emphasised that the students' engagement in the schools is ongoing, fluctuating during the school year. Therefore, having a balance between permanent displays and temporary displays is important to provide better physical environment in the classroom that does offers visual variety and yet also some constancy.

Acoustic Environment

The quality of the acoustic environment influences students. Previous research indicates that there is a debate about the negative aspects of noise in the learning environment on students' performance *(Earthman, 2002b)*. As reported by *Kopec (2006)*, research on the acoustic environment indicates that noisy spaces cause distraction and obstruct the learning experience. Other papers have claimed that the distraction problem is not solely caused by a noisy environment in itself, but could be determined by other factors such as gender, age and academic ability. *Weinstein and Weinstein (1979)* emphasise that there is no impact of noise

in the learning performance, but the students with hearing impairment are more likely to be influenced by noise. The effect of a poor acoustic environment can create a negative learning environment for many students, such as noise annoyance, impairment of reading performance, lack of understanding and engagement, and could cause some health problems such as increased blood pressure and aggressive behaviour *(Edwards, 2006;Earthman, 2002b;Lackney, 1994)*.

Noise level is also connected with other psychological elements when assessing the classroom environment, which are achievement, spatial cognition, mood, privacy, and density. *Hygge (2003)* points out that noise confusion appears to have links with the student's background and memory; this is not a medical issue, but could interfere with the students' mood, history and personal experience. Therefore, noise problems vary between students. This does not mean that the acoustic environment should be ignored, but the students' needs require attention and acoustic circumstances need to be under control within the variety of teaching styles and system *(Klatte et al. , 2010a)*. The acoustic environment quality (noise) aspect are shown in Figure 20, and explained below.
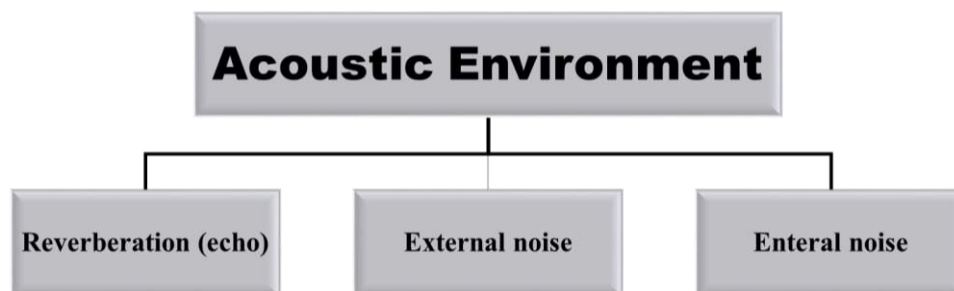
Figure 20. Acoustic environment factors

Reverberation (echo)

The rebound of sound waves on a hard surface causes noise from reflection of sound waves within the classroom and causes reverberation *(Kopec, 2006). Lang (1996)* mentioned that reverberation produces elevated levels of noise in the classroom due to reduced auditory quality ('purity' of sound) in the space. This circumstance needs attention from designers configuring the space to reduce 'noise'; that could be by altering surface finishes (floors, ceilings), that reduce reverberation, or by changing the room's planned dimensions and intended student density. A government advisor on architecture and urban design and public spaces in the UK, *CABE,* state *"A good acoustic environment, without excessive*

reverberation, is achieved with an acoustic plasterboard ceiling and upper wall linings, and carpeted floors." (CABE, 2010, p.101)

External noise

Outside sources derived from street traffic, airplanes, animals and pets can all raise noise levels in the school room *(Allen and Hessick, 2011)*. *Hawkins and Lilley (1998)* set out guidelines for school design and appraisal and stated that the neighbourhood setting of the school should not be too noisy and otherwise disturbing the students and their learning: avoiding heavy motorways and industrial areas is important. *Shield and Dockrell (2004)*, however, claimed that the external noise level has little effect on the students auditory quality, whereas the noise created by the students themselves and their activity in the classroom had more impact on the overall acoustic volume. *Bronzaft and McCarthy (1975)* investigated the effect of the noise on one side of a classroom which overlooked a noisy external area, and they found that students who were situated on the noisier side had lower reading achievement scores than students settled in quieter side.

To reduce the effects of exterior noise, *Lang (1996)* suggests that consideration be given to thick walls and appropriate sound insulation while planning a learning space. Also, locating schools farther away from roadways, airports, and public areas are important considerations.

Internal Noise

The daily activities and actions of students in the classroom creates noise, perhaps generated by general conversational human speech in the classroom, furniture movements, electronic devices like computers and projectors or air conditioning *(Allen and Hessick, 2011)*. Studies show the effect of classroom reverberation on students' performance and achievements as the main aspect of internal noise *(Klatte et al. , 2010a)*. *Fisher (2001)* reported that the open-plan classrooms that suffer from noise issues can be improved by variety of methods, such as carpet flooring to absorb sound. To have a balance of noise levels in the classroom by the empathetic use of background music also encourages reading achievement levels. Students' engagement in open-plan schools leads to more noise inside the classroom and clearly links with the teaching styles that been used *(Lackney, 1994)*.

The ability to control the acoustic and auditory environment quality is as an important factor that has a critical effect on learning experience. *Earthman (2002b)* indicated that students learn more efficiently in classrooms with noise level of 40 decibels (dB) or less. *Earthman* concluded that an effective learning acoustic environment is needed for clearer hearing and understanding of what is being taught. Therefore, avoiding any distraction that causes students to struggle to hear is crucial for establishing an effective learning environment. Keeping the classroom noise level in balance with the standard recommendations is important and need to be considered by designers and architects of instructional spaces.

Thermal environment

One of the significant requirements for a student's satisfactory performance is to maintain the temperature in the learning environment at an appropriate level *(Earthman, 2002b)*. Studies about environmental quality classified the thermal factor as a significant issue for a learning environment, because the classroom temperature affects students' behaviour and achievement *(Veltri et al. , 2006; Higgins et al. , 2005)*. Clearly, the temperature levels in the classroom differ from place to place, which means that the environmental and external weather conditions affect the students' ideal thermal environment. *Kopec (2006)* identified numerous papers that mentioned that students prefer a cooler classroom by 5 to 10 degrees centigrade than their teachers. Similarly, *McDonald (1960)* found that cool classrooms that had air-conditioning showed less incidences of disruption, and *Al-Husaini (2004)* claimed that a hot environment influences a students' performance by an associated increase in aggressive behaviour. *Canter et al. (1976)* state that the negative impact of a temperature which exceeds 74 °C could decrease the students desire to work, where they struggle to understand, and leads to an increase in stress.

Four factors that affect the human body concerning temperature adjustment are radiant temperature, air temperature, humidity and air movement *(Allen and Hessick, 2011)*. Therefore, the ability to maintain the ideal temperature in a learning environment has a crucial impact on students' performance and mental efficiency, both *Kopec (2006)* and *McGuffey*

(1982) confirm that controlling the thermal environment will significantly help the students' performance.

Harmon (1953) state that the optimal learning temperature for a classroom is between 20°C to 23.3°C Celsius (69-73° Fahrenheit), but the air movement and humidity levels must be accessible and controllable by students and teachers. However, *Pilman (2001)* suggests that the appropriate temperature for learning in the classroom is 22.2°C Celsius (72°F). The studies show that higher or lower temperatures than these decrease students' memorisation abilities. *Earthman (2002b)* suggests the ideal temperature is between 20°C to 23.3°C, concurring with Harmon.
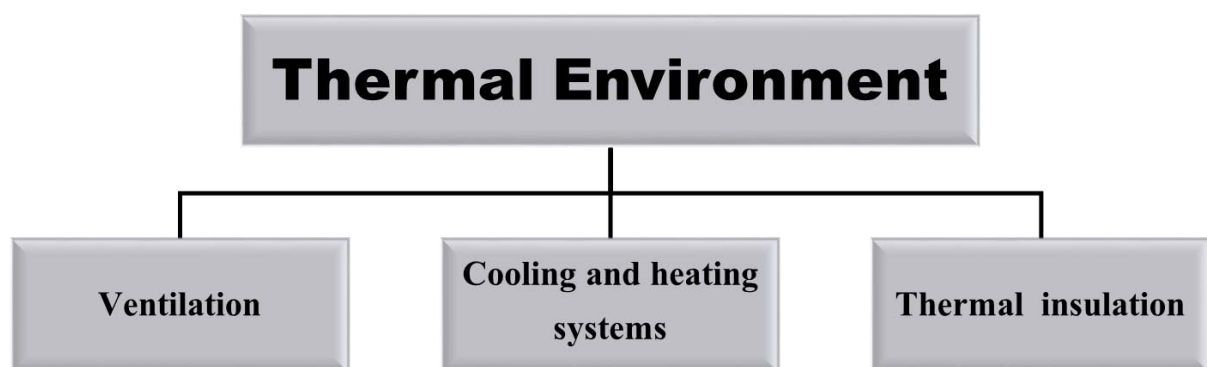
Figure 21. Thermal environment factors

Figure 21 shows the factors that improve the thermal quality in the learning environment; which have serious impact on educative effectiveness *(Kopec, 2006; Allen and Hessick, 2011; Earthman, 2002b; CABE, 2010)*:

- Ventilation systems that are important to refresh the air in the classroom and expel excess humidity, and support air movement; providing large openable windows allows students to manage temperature and also enhances the ventilation quality.
- Appropriate cooling (air-conditioning) or heating systems that can be separated in terms of control in each classroom, and are easy to operate, is another important factor allowing alternative types of ventilation especially in warm weather conditions.
- Providing suitable thermally designed building materials to stabilise the temperature in cool and hot periods is beneficial.

Thermal comfort for the students and teachers inside the classroom must be taken into consideration within the physical environment.

Personal elements

Studies show that there are many personal elements that enhance the student's comfort in their environment, which increases their ability to learn and make sense of their education. *Han (2008)* suggests that providing houseplants inside the classroom can be beneficial: a survey that he conducted found that students felt more comfortable in classroom that had indoor plants compared with another classroom which had no plants. However, *Allen and Hessick (2011)* emphasise that no connection has been found between providing plants in classroom and students' achievement scores, which indicates a need for more investigative research into students' comfort and learning outcomes. However, *Daly and Suggs (2010)* claim that empathy skills and communication increased when animals and pets were introduced into the teaching space, thus supporting interaction among students and teachers. *Hummel and Randler (2011)* found that animals in the classroom improved the performance and achievements of students.

The interaction and motivation between the students and their learning environment needs to be linked with variety of disciplines, not just those that involve learning. Each student has different preferences and concerns, therefore it is important to consider the variety of physical elements in the space that might engage the students positively within the educational situation.

Summary of Chapter Three

This chapter discusses the theoretical aspects about the learning environment, the influence of the social, psychological, cultural, teaching and physical environment on students' behaviour and performance, in short:

- Teaching and learning quality are not based on the physical environment factors only, but also on social, psychological, cultural and teaching environment parameters.

- Assessments of the learning environment must be undertaken equally by educators, designers and architects and environmental psychologists: the physical learning environment is significant for students' learning.

- The evidence-based researches of the physical learning environment are presented according to five components: spatial, visual, acoustic, thermal and personal elements, which are important to be considered in the present research.

Chapter Four

Research methodology

The design of the research

Background study:	Identifying the gap in the existing knowledge to validate the research proposal
Aim and objectives:	To develop a better understanding of the interrelation of physical environment and learning performance
	Identification of important physical elements/factors which have important bearing on learning environment

Exploring socio-spatial organisation of learning environment

Examining feature that characterises the learning environment

Assessing the mechanism of integration of all socio-physical factors in learning environment

Conduct a Pilot Studies in random schools in Kuwait to obtain an initial data and check the methods

Literature review:

Promoting the approach of the study and developing a conceptual framework for the research

Research concept — Research questions — Research strategy

Empirical work: — Establishing criteria for the case study

Tracing the physical and environmental characteristics of selected schools

Examine the students' performance and motivation in each school

Comparative analysis of the collected data from the case study

Conclusion: Responding to the research questions by summarising the findings and suggesting the research implications for practice and research

4 Research Methodology

The Literature Review within the previous chapters has highlighted the impact of the physical learning environment has on teaching and learning experiences. These influences are classified through a variety of viewpoints including social, psychological, cultural, teaching and physical perspectives. In order to identify and analyse these aspects critically, core data selection methods and approaches will be adopted, and these methods will be dependent on the research objectives and written in response to the research questions. This chapter describes and examines the design strategy for the present research. The chosen methods, and the processes utilised while collecting the required data are categorised. The theoretical basis of the research methodology illustrates the reasons for selecting the approach, as well as highlighting the fundamental considerations that have been taken into account. The chapter has been structured as follows:

Part 1 - Review of the methodology:

- Introducing the systematic and theoretical approach of the research,

- The philosophical background of the social relation research,

- The research worldview based on a 'mixed-methods' approach.

Part 2 - Designing the methodology:

- Illustrating the strategic process, required data, and the samples based on the research objectives,

- The research instruments utilised in this study,

- The analytical approach that is used.

4.1 Parts 1 – Review of the methodology

Theoretical approach of the research

The term 'research' has many meanings but is a kind of action that indicates deliberately collecting new data and finding out the 'truths' about particular areas of enquiry. *Walliman (2005)* stated that the using of 'everyday research' (perhaps information gleaned from the world at large) lacks true research meaning, due to its nature of classifying knowledge or data with no determined purpose, with not enough interpretation of the facts.

> *"Research is essentially derived from the needs and practices of everyday life. It fulfils the purposes of describing, examining, explaining and developing new ideas. In academic terms, it may develop or test theory, describe existing knowledge or solve specific problems" (Brewer, 2007, p.1).*

Saunders et al. (2011) defined the nature of research as collecting of information on a particular topic, but proper research has three significant characteristics as follows:

- A definite and clear purpose for the study, which supports the context of the research,
- A strong process and system to reach to the conclusions that includes the explanation of the method used.
- Systematic interpretation of the collected data that involve the appropriate analysis of the data based on logical understanding.

Ghauri and Grønhaug (2005) claimed that research is not just beliefs or experience, but a logical correlation undertaken to find the logical truths that result from describing, explaining, and understanding, then criticising and analysing methods. Consequently, research needs a clear systematic way and strict plan based on logical relationships and appropriate methods to be used, in order to collect the required data and according to the limitations of the research *(Saunders et al. , 2011)*.

> *"Research is about acquiring knowledge and developing understanding, collecting facts and interpreting them to build up a picture of the world around us, and even within us. It is fairly obvious then, that we should hold a view on what knowledge is and how we can make sense of our surroundings. These views will be based on the philosophical stance that we take." (Walliman, 2010, P.15)*

The philosophy of research in social studies

Social research studies are a significant tool that increase the social values and allow us to make crucial personal choices *(David and Sutton, 2004).* The framework of this research is based on social relationships that emphasise the ways that students, teachers and school users perform, experience, and feel in the learning environment.
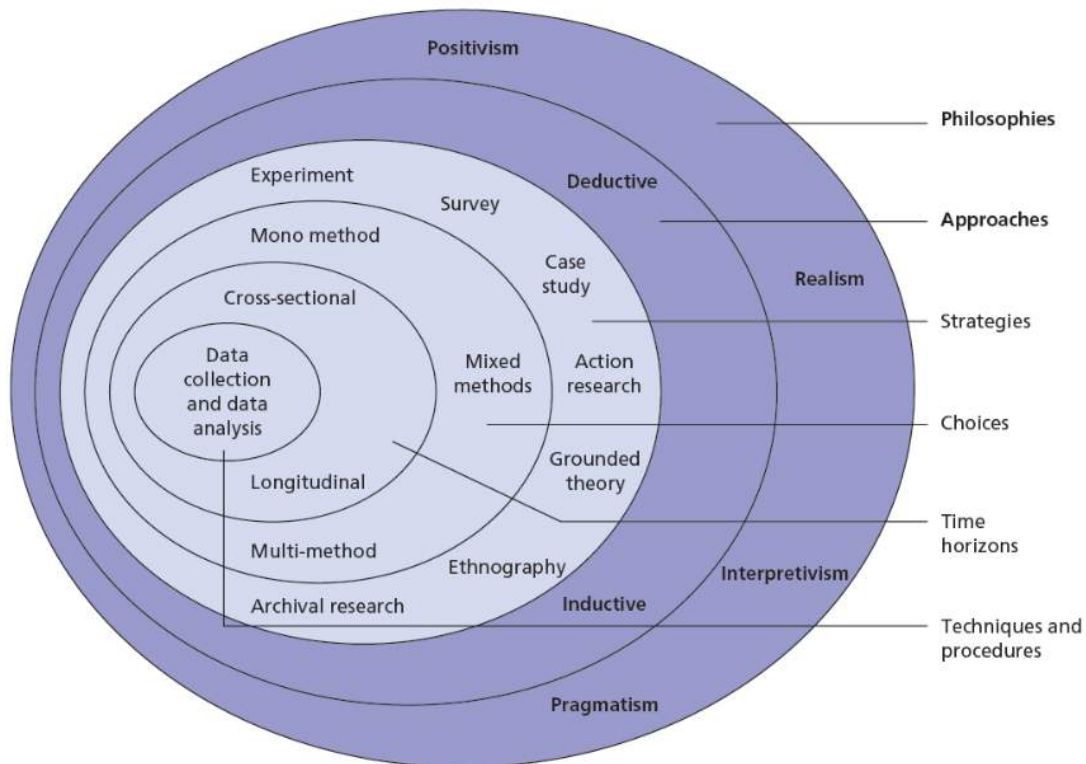
Figure 22. The research philosophy 'onion' (Saunders *et al*., 2011, p.108)

Saunders et al. (2011) illustrated the research philosophy as shown in Figure 22, with the strategy of the research towards the centre. *Punch (2014)* argues that there are three main paradigms or philosophical theories that have been recognised in social research:

- Positivism is based on quantitative methods that develop nomothetic knowledge. These researches are grounded on the beliefs that the function of science is to widen a realistic description and explanation in the form of global laws.
- Interpretivism is based on qualitative methods focused on the meaning of things, which direct the people to understand the behaviour and then appreciate of their world.
- Constructivism is based also on qualitative methods, and emphasises people's social experiences in practice, leading them to understand their surroundings while they live or work.

However, *Creswell (2009)* classified these theories as the philosophical worldviews following the research approaches *(Figure 23)* that have to be formed according to three factors; 1) the philosophical worldview, 2) the selected strategies of inquiry, 3) The research methods that would be used from collecting the data to the analysis and interpretation.
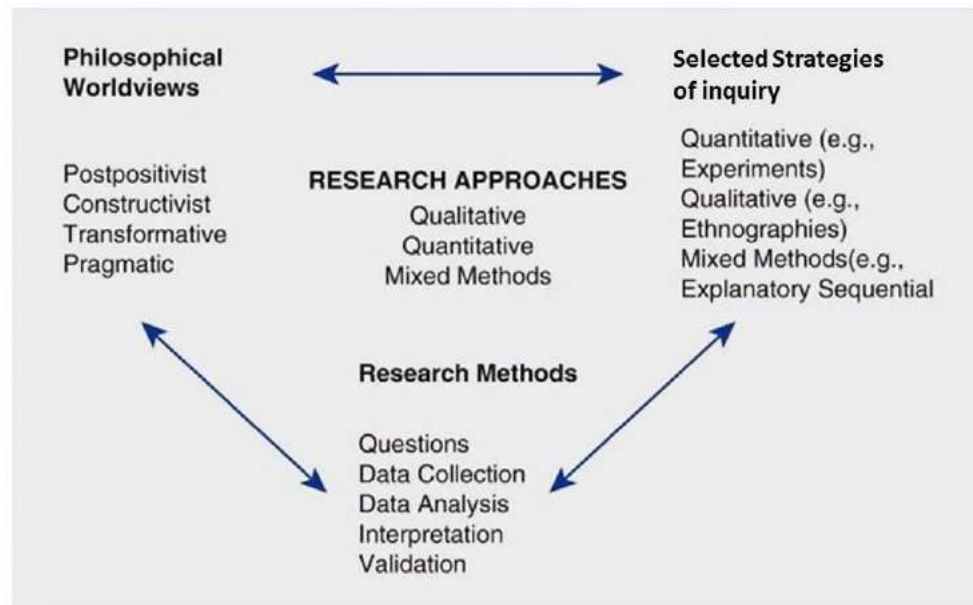
Figure 23. The research framework, interconnection of paradigms, strategies and research methods (Creswell, 2009, p.5)

The social research approaches as mentioned by *Creswell (2009)* has three main strategies are:

1. Qualitative research: This approach aims to explore and recognize the individual meaning and link it with the complicated situations that develop our understanding. The questions that have been raised when investigating a social or human problem are then organised through data collection by analysis to reach to the underlying synthesised meaning.

2. Quantitative research: This approach *measures* the relationships between the variables under study, focusing on numerical data that is analysed by statistical techniques. This approach has benefits in reducing bias in social research, and controls the explanation of the data and allows generalisation and replicability of results.

3. Mixed methods research: This consists of both qualitative and quantitative research approaches, where their combined value and flexibility are used to strengthen the study. The mixed methods approach was chosen for the present research which needed numerical data (quantitative) and meaning (qualitative) evaluation.

Using the mixed-methods approach is more commonly used in studies such as this, due to its flexibility which maximise data collections and perspective and leads to greater validity of conclusions *(Bulsara, 2015)*. The 'revolution' of social theories began as a paradigm 'war' between quantitative and qualitative researchers. The quantitative approaches dominated the research form from the 19th century until the mid 20th century. However, the qualitative approaches developed exponentially thereafter and led to the mixed methods approach *(Punch, 2014; Bryman, 1992; Teddlie and Tashakkori, 2003)*. However, the following points determined the specific research reasons for using the mixed method for the research objectives of the present study *(Creswell, 2009 ; Rossman and Wilson, 1985; Morgan, 2007)*:

- A flexible philosophy system, which is not limited to quantitative or qualitative approaches.
- Enriching the researcher's ability to use a variety of data collection techniques and procedures that suit the research aims and objectives.
- A variety of data analysis styles are invoked to provide the best understanding of the information and data collected.

In terms of the research paradigm, there are two main approaches to a mixed research project: the pragmatic approach and the paradigm-driven approach *(Punch, 2014)*. The pragmatic approach begins with questions that require direct answers, and then the most appropriate methods to find the answers are selected; the questions could be extracted from many sources including literature, media and personal experience. *Creswell (2009)* stated that *"Pragmatism as a worldwide arises out of the action, situation, and consequences rather than antecedent condition (as in postpositivism)... Instead of focusing on methods, researches emphasize the research problem and use all approaches available to understand the problem" (Creswell, 2009 ,P.10)*.

The paradigm-driven approach is limited in that questions and methods are articulated from acceptance of the paradigm. *Punch (2014)* emphasises that a *pragmatic* approach is important to acknowledge deeper issues and methods without making one stance the major posit, then elaborating each point separately by a paradigm-driven approach.

Therefore, the paradigm route for this research follows the pragmatic worldview which has clear benefits and broad characteristics that supports the methodology.

Summary

This section reviewed the three key aspects of the research methodology: the theoretical approach, the philosophy of social studies, and the 'mixed method'. The next chapter describes the procedures and methods used in this investigation in greater detail.

4.2 Part 2 - The research design

Introduction

This research aims to investigate the influence of the physical environment on learning and teaching performance and behaviour, therefore it needs to investigate the overall experiences of the students, teachers and school staff. *Creswell (2009)* emphasises that research based on the mixed-methods approach provides a better understanding of the research problem. The research starts with a broad survey investigating the basis of the research, and then focuses on more-detailed data. The physical survey, observations, and questionnaire instruments that are used primarily are then enhanced by semi-structured interviews to collect specific information from the participants. Therefore, the mixed method approach requires both a qualitative and quantitative research strategy.

The quantitative approach considers factual information and then qualitative strategies are used to explore, but focus on, the significant details. These methods combine deductive logic with precise empirical observation of individual behaviour in order to discover and confirm a set of probabilistic causal laws, that can be used to predict general patterns of human activities *(Neuman, 2005).* In the literature review (Section 2.9), educational authorities consider the ethos as well as the physical circumstances of the learning environment. Therefore, the *quantitative* methods can use experimental procedures and numerical measurements to explore the connection between the physical environment quality on learning procedures and outcome *(Creswell, 2009 ;Hoepfl, 1997).*

The *qualitative* strategy of this research is based on the collection of data in the form of narrative rather than numbers, but that can form a deep and complex approach in terms of trying to arrive at conclusions. *Hoepfl (1997)* mentioned that this strategy has various considerations and benefits; it can:

1. Improve the understanding of the new phenomena that has not been researched.

2. Give a new perspective to the knowledge which has not been investigated before.

3. Enhance the ability to identify crucial variables which might be hard to determine or tested quantitatively.

4. Provide an open-ended strategy (not an 'either / or') 'yes / no' approach, that will reveal new information.

Therefore, the purpose of these methods is to reach an understanding of information, such as values, opinions, behaviours in a social contexts *(Brewer, 2007). Neuman (2005)* confirms that this approach can facilitate systematic analysis and be an investigative tool through the direct observation of people in a natural setting, to arrive at an appreciation of how people create and maintain their social worlds. This is particularly useful in the content of the present research: to see how an interior space setting can benefit an educational system.

This study aims to develop a better understanding of the dynamics of change in the learning environment, while exploring the interrelationship of social and spatial/physical features in new-build schools. Although the physical and pedagogical transformation of the learning environment might each be understood through quantitative facts and figures, their relationship can be understood through careful empirical observation, and by employing qualitative methods. Consequently, quantitative methods help in the understanding of the physical and functional characteristics of the physical environment. By contrast, the qualitative methods investigate the influence of the physical environment on learning outcomes, and student's experiences. The following section describes the research questions and methods used.

The research questions and objectives

Characterising the relationship between the learning environment on the learning and teaching outcomes in Kuwaiti public schools is the objective of this research. Since the broad definition of a learning environment includes architectural characteristics and organisational planning, the study focusses on the quality of internal spaces in terms of size, lighting, colour, furniture, seating arrangements, as well as the quality of teaching environment on users' behaviour and attention. The literature indicates that school users are heavily influenced by

their physical learning environment, and a positive set of circumstances enables them to perform better *(Kopec, 2006)*.

This research focuses particularly on the quality of interior design and architectural factors within the educational sector in Kuwait. The research questions are stated below:

1. What is the overall quality of the physical learning environment in Kuwait's intermediate schools?
2. Who is responsible for the current quality of the learning environment in Kuwaiti public schools?
3. Do the influences of the physical learning environment change, based on the school's location and socio-cultural variations?
4. To what extent does the quality of the classroom environment affect learning outcomes in Kuwaiti public schools?
5. How does the classroom environment affect the student and teacher's interaction and movement within the classroom?

The research process

The mixed-method approach (see above) is flexible and can be undertaken by variety of methods based on the information being sought. This research assessing the quality of the school building in Kuwait intermediate schools, as well as evaluates the influence of environment on user's performance. *Creswell (2009)* mentioned that there are three strategic methods for a mixed method approach; the sequential strategy, concurrent procedures, and transformative techniques. The sequential procedure was chosen to be used for this research, beginning with quantitative approaches to confirm and test the research context. Then key points were extracted from first strategy to be investigated in more depth through qualitative methods.
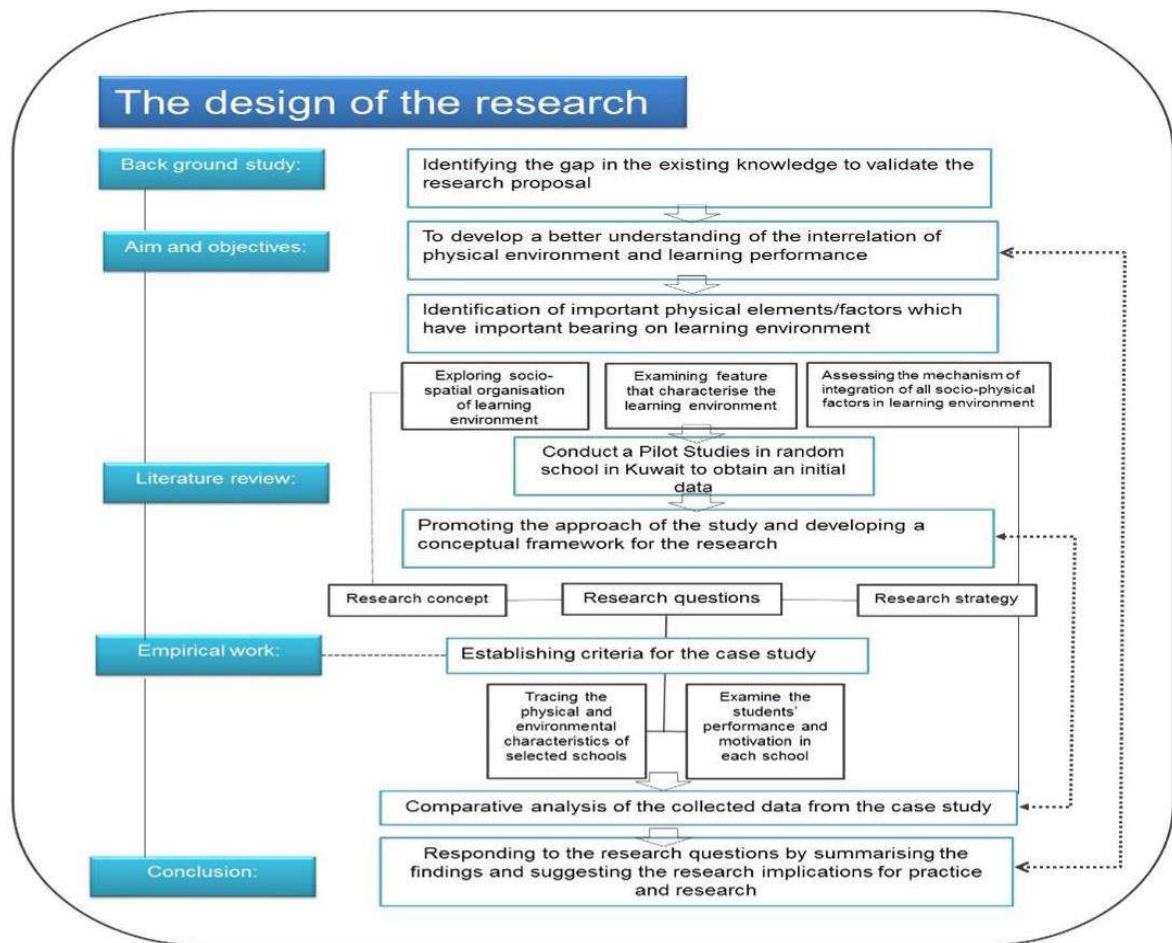
Figure 24. The research design

The research design is indicated in Figure 24, which illustrates the significant process of the research journey into the relationships between students and the learning environment. The literature review is important to provide the background to the research, and the theoretical foundation of the research covers the philosophy of education and the development of the physical learning environment. The selected methods were divided into two approaches which are discussed below, but in summary the methods are:

- The quantitative methods, which used three tools:

    1. Physical survey which aims to gather a variety of data about the building's quality, dimensions, and visual impact.

    2. An observation method that was undertaken in 20 classrooms in the five selected schools, by evaluating the quality of classtime, and the influence of the classroom on students and teachers.

    3. School inventory methods where three different questionnaires were designed for the three groups: the first group was the students, to

collect specific details about the quality of their experience in the learning environment. The second group was the teachers, the aim was to gather their opinions about their learning environment facilities and any difficulties that they faced. The third group was the school administrators; this questionnaire was intended to collect crucial details about the school building quality, like building maintenance, cleaning activity, building age and renovation.

- The qualitative methods, based on interviewing the director of the design and construction department in the Ministry of Education to gather an understanding of the official approach to the learning environment quality[4].

The required data
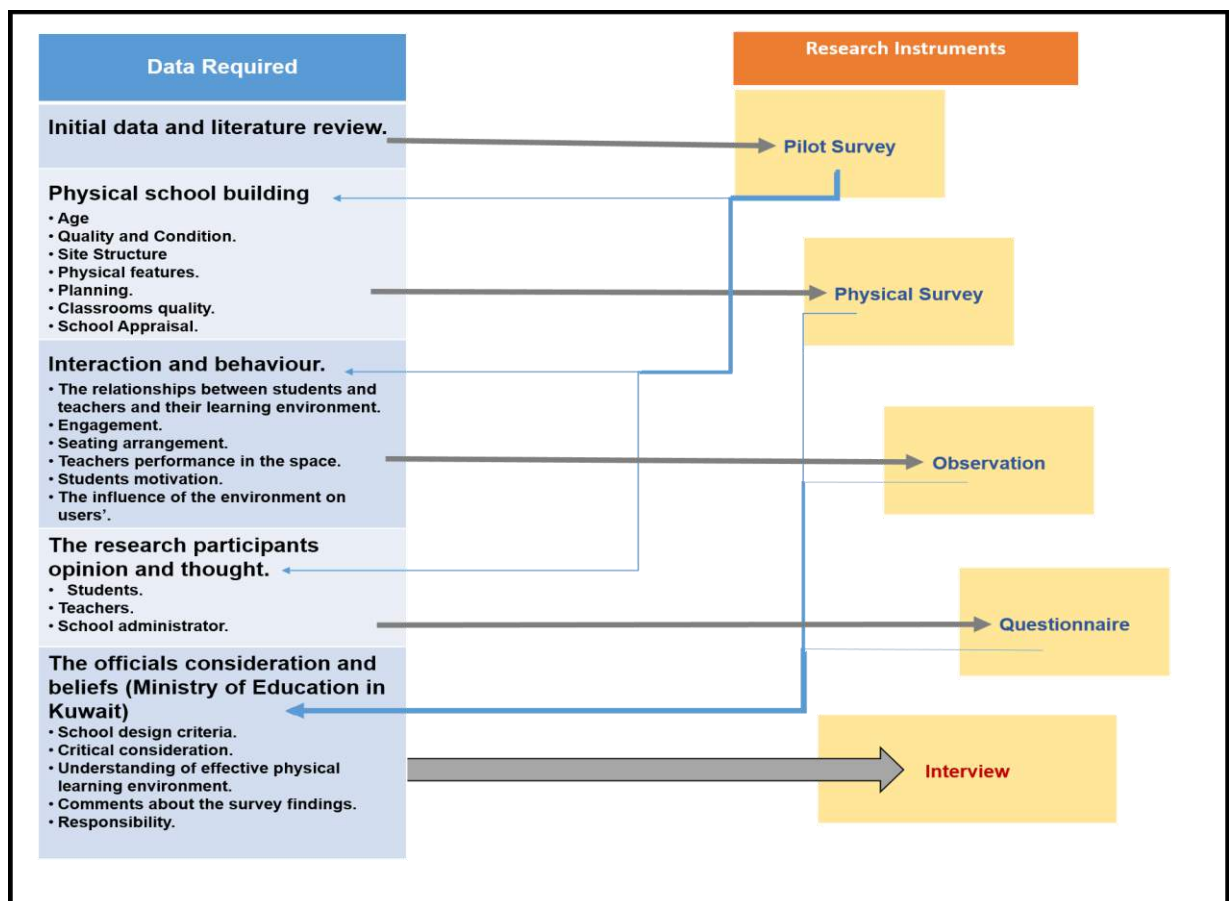
Figure 25. The data required and the research instruments.

---

4 The interview was also designed to evaluate the collected data from the physical survey, observation and questionnaires with the official representative of the Ministry of education

Figure 25 shows the research strategy, which is based on the data required and the methods that were used in the research. The following demonstrates the process employed for collecting data:

- Gaining a general understanding of the literature that identified impacts of the physical learning environment on learning and teaching experiences and quality through the physical survey.

- Evaluating the learning environment in Kuwaiti intermediate schools, especially the physical design of the classrooms which includes the seating arrangements, layout and window sizes, acoustics, thermal features, and visual appearance. These features are crucial to the present research and have an influence on learning. Other physical settings were also considered, including building age, site planning, and the location of the school through a physical survey.

- Correlating the school users' (i.e. students and teachers) experience and their physical environment, and the ways that students use the space during lessons. The literature also indicates that the physical environment affects the performance of teachers, so, their performance in the classroom can be influenced by the organisation and quality of the learning environment. These data were collected through observation.

- Collecting and analysing views of those using the learning environment. These data were collected from students, teachers and school administrators through questionnaires.

- Collecting and analysing views of the educationalists about the current learning environment. Their understandings, considerations, and procedures for school design were evaluated through a semi-structured interview.

Research sample/ pilot study

The present research is directed at intermediate public schools in Kuwait. As mentioned in Chapter one, due to the feasibility and cultural considerations as well as the ethical issues in Kuwait; this study focused on boys' schools only, and targeted students who are 11 - 14 years old, and teachers and the school administrators. The investigation plan was divided into three methods, the **pilot study**, and the **case studies** including **physical survey, observation** and **questionnaires,** then an **interview**. The collected samples are shown in Table 5.

Table 5: The research sample.

Description	Circulated number	Collected Number	Schools number involved
1- Pilot Study	400	300	3 schools
2- Survey methods:			
A- Physical Survey	NA	NA	5 Schools
B- Observation	NA	20 Class hours	5 Schools
C- Questionnaire:			
Students	900	613	5
Teachers	200	168	5
School Director	20	18	18
3- Interview (Qualitative)	NA	1	

The pilot study was conducted in three public intermediate schools, the sample questionnaires were collected from 300 students at random. The case studies achieved within 5 schools that followed the outcome of pilot study. Table 6 shows the whole population of schools in intermediate schools of Kuwait. Moreover; it is important to note that overall 80% of questionnaires were returned.

Table 6: Distribution of schools, classes, students and teaching staff in intermediate schools in Kuwait. (Ministry of Education, 2011)

Research methods

This section are discussing the design, credibility and validity details of the tools employed.

The pilot study

A pilot study was conducted to evaluate, test and validate the most appropriate tools and strategy for the research. *Yin (2014)* stated that *"Pilot case studies: a preliminary case study aimed at developing, testing, or refining the planned research questions and procedures that will later be used in the formal case study; the data from the pilot case study should not be reused in the formal case study." (Yin, 2014, p.240). Saunders et al. (2011)* highlights the benefits of using a pilot study, including measuring the participants' response to the questions, and to obtain some assessment of the approach to the questions. Checking the reliability of the data and then analysing to test the validly of information for the research is important. *Walliman (2010)* define the *Pilot study* as "*A pre-test of a questionnaire or other type of survey on a small number of cases in order to test the procedures and quality of responses." (Walliman, 2010,p.175).*

The pilot study was conducted and structured as a questionnaire to identify student attitudes and perceptions within their learning environment in Kuwait, as well as test the research tools that proposed to be used in case studies.

Case studies

The most important elements of the pilot study influenced the structure of the ensuing research to expand the investigation and collection details for the present research. *Creswell (2009)* emphasises that case studies research can provide a numeric interpretation of the attitude or opinions of the population. Whereas, *Robson (2011)* highlights the following features:

- Using a fixed quantitative-based research design.
- The data extracted from many of individuals aims to collect small amounts of data within a standardised form.
- The participants need to be representative of the actual population for the research.
- Collecting specific data by way of various approaches in a defined timescale.

Descriptive measure techniques were conducted to capture an understanding of the quality of learning spaces and facilities, to illustrate the user's interaction and experiences in the classroom. The data gathered through three methods, therefore are: 1) Physical survey which included school appraisal methods. 2) Observation during the classtime. 3) Extended inventory survey for students, teachers and school administrators. The details of each of these methods is demonstrated below:

1. Physical survey methods

To highlight the main problems and evaluate the school building quality a physical survey was undertaken to compare five schools in Kuwait by assessing the quality – the appropriateness - of the building. Due to the lack of previous research in this area reviewing the quality of school buildings in Kuwait is important, adding original information to the literature.

This approach is designed to record data about the building condition including age, location, quality and landscape setting, as well as the quality of the internal physical features such as the spatial, visual, acoustic and thermal quality in the schools under study. The appraisal model is based on *Hawkins and Lilley (1998)* (see Appendix B). As mentioned in the literature review (Section 3.4), to create an effective learning environment the concerns of educators, architects and interior designers are crucial. This appraisal model developed by educators and architect's considerations and directed to the intermediate schools stage. Additionally, the reliability and efficiency of the appraisal context and language were tested and checked to allow flexibility *(Hawkins and Lilley, 1998)*. Six criteria for the research are listed in this model that as follows: 1- the school site, 2- structural and mechanical features, 3- plant maintainability, 4- school building safety and security, 5- educational adequacy, 6- environment of education. Therefore, the following points were addressed in the physical survey method:

- The approximate school site size measured using Google maps.
- The school site plan were collected, but many schools did not have a site plan or structural blueprint. Some free hand sketches and photographs were taken to create an approximate school schematic plan.
- Classroom measurements were recorded using a tape measure.
- The acoustic quality was checked through a Smartphone app (Sound Meter-Android) which measured the noise volume in decibels (dB) via the phone

microphone. The measurements were taken at different times for each classroom for accuracy.

- Many photographic images were taken of each part of the school; these were used to evaluate the quality of building and facilities.

- Notes were taken during the investigation, collecting relevant data for the research.

2. Observation

Both the behavioural actions and the meaning of that behaviour are important, when characterising a realistic picture of any situation. Observation methods can be achieved through different methods in the learning environment: as a formally engaged observer in the classroom, this could be recorded by the teacher, or just by casual observation of the students' and teachers' performance. Sometimes incidental procedures like observing the participants through camera and CCTV or mirror can be useful *(Yin, 2014). Burton and Bartlett (2009)* confirm that observation is a crucial research strategy for educational research and could enhance the ability of observing everyday teaching process. Therefore, the structured observation method was applied in this investigation.

The practical issues for collecting the observation data as mentioned by *Punch (2014)*are divided into two approaches; **1)** a quantitative approach which is structured and needs a detailed plan. It is usually involves communication with the participants to collect detailed data. **2)** a qualitative approach which is unstructured; this approach is a more natural way of gathering information and is open ended. It is involves recording the data using a range of electronic devices like video and audio equipment to collect as much data possible. This approach has been used to observe the students and teacher behaviour and attitude during class time.

Combining these two approaches is beneficial for this research, which suits the strategy of this research. Therefore, the quantitative observation used to assess the quality of the physical setting and its impact on the teaching quality was achieved through:

- Observing the quality of the space during the school time rather than after school time.

- How the environment enhances the teaching and learning experiences during classtime.

The qualitative observation used to observe the impact of the classroom settings on the students and teachers' communication and performance, was achieved through studying:

- The relationships between the classroom users and their physical features; through their behaviour, attitude, experience, activity and performance.

- The teachers' role and movement in the learning environment and the ways that they organise the space for their teaching inside the classroom.

The classrooms have been chosen in the selected school, after consultation with the administrators, the teachers were informed that their class hour would be observed without any effect of their teaching integrity. The following points were considered and taken into account:

- Video recording of classtime was not used in the research, as recent legislation of the Ministry of Education requires consent from each parent. Therefore, it was not appropriate in the limited time available.

- The observed teachers were informed about their ethical rights during the investigation; they could refuse to take part or stop the observation at any time. Also the collected data were kept anonymous and secure.

- An appropriate place for the observer to be situated was identified, because it is crucial in understanding how the students experience in their space.

- The observer recorded and took notes including the teacher style and approach to teaching, the movement in the space during the class hour, also the ways that students function in their classroom and the classroom organisation.

- The classroom arrangement was sketched and the students and teachers movements in the classroom noted.

- All data were recorded in sketch form or text during classtime, and then correlated at the end to check the validly of data and for recording feedback.

3. Questionnaires

The survey questionnaire aimed to collect general views and facts from participants in the study. It can cover large geographical areas in short period of time *(Burton and Bartlett, 2009)*. Although the questionnaire is quantitative-based research, it could be used as qualitative research in some cases *(Walliman, 2010)*. Students' understanding of their learning

environment plays a fundamental role in their experience and performance. *Frith and Whitehouse (2009)* mentioned that the functionalism of the learning environment is started by investigating the spaces users' requirements in term of the biological, psychological and sociological needs. Thus, in order to find answers of the research questions, examining the level of understanding and beliefs of students was the core, then teachers and school administrators within their learning spaces.

Many researchers have developed their questionnaire model to evaluate their research hypothesis, while others utilised existing validated tools developed and used in their studies *(Bowers and Burkett, 1989)*. The questionnaires for this research were based on an existing model to ensure reliability and validity. These tools as mentioned below have been revised and modified according to the research aims and objectives, and verify the outcomes of the pilot study. These tools are as follows:

- The school building rating scales that were developed by *Sanoff (2001),* considering the physical features, learning environment, outdoor areas, social areas, safety, security, media access and circulation routes.

- A checklist designed by the Leicestershire County Council entitled "Promoting positive learning environments" , this guide is important in identifying the quality of the learning environment aspects from the participants point of view *(Educational-Psychology-Service, 2002).*

- *Cash (1993)* developed a tool titled as "*Commonwealth Assessment of Physical Environment (CAPE)".* This tool has been widely used in recent studies; to evaluate the physical features of the school building, for example building age, climate, acoustic, density, and facility condition.

Three questionnaires were created for this research for students, teachers and for school administrators. These three questionnaires aimed to assess and document the range of opinions regarding the quality of the learning environment. While, the physical survey and observation aimed to investigate the users' behaviour and attitude to the space arrangement, quality, and organisation. The three questionnaires used a variety of measuring scales depending on the required data and the ages of participants and its role within the learning environment. They are as follows:

- A student questionnaire to gather information about their response to the physical learning environment. The outcomes of the pilot study showed the students in intermediate stage schools were not able evaluate their environment properly, so the questions were designed to focus on positive or negative responses from participants. Therefore, 'yes or no' responses are appropriate methods that represent beliefs and thoughts about the learning environment *(Burton and Bartlett, 2009).* An opportunity for free-form narrative was used to give students an opportunity to give feedback about their learning environment.

- A teacher questionnaire, using the Likert scale which represents the teacher's attitude and responses to the questions *(Robson, 2011).* This scale gives perfunctory data only. But it gives approximate answers that represent thoughts, as many participants do not feel comfortable with open ended questions. A 1 to 4 scale was used for this questionnaire. An additional comment and suggestion space was offered at the end of the questionnaire to collect extra data.

- The school administrator's questionnaire scale did not follow one scale strategy: many scales were used to collect as much data as possible. This approach was conducted to acquire data for both open-ended questions, and closed questions, designed to suit the research objectives. Additionally, each question aimed to gather particular data, and a comments space was provided at the end of the questionnaire.

Interview

In order to fellow sequential mixed methods procedures for this research, the investigation began with quantitative approaches achieved through the surveys including the physical surveys, observation and questionnaire to collect a range of data. Thereafter, these data revealed the current quality of the physical learning environment in Kuwaiti public schools. The interview was used as a qualitative method with the purpose of discussing results with the representative in the Ministry of Education of Kuwait to draw recommendations.

The interview process is widely used within the qualitative or qualitative social research, and can be conducted in structured or unstructured format *(Burton and Bartlett, 2009).* The structured interview usually intends to be quantitative as it focuses on fixed questions, which are applicable for a large number of participants to maximise the reliability and validly of the data. Whereas unstructured interviews are more qualitative and aimed at particular research

ideas and interviewee points of view, enhancing the researcher's ability to collect detailed answers to the questions within a flexible and open process *(Bryman, 2015)*. Qualitative interviews were chosen for this research. *Creswell* defined the qualitative interview methods as:

> *"These interviews involve unstructured and generally open ended questions that are few in number and intended to elicit views and opinions from participants"* *(Creswell, 2009 ,p.181)*.

Augustin and Coleman (2012) recommend that detailed and specific questions are much better than general questions. This could be achieved by providing a mix of broad, open ended and direct questions during the interview to encourage the interviewee to speak freely. Thus, the questions were developed about broad design considerations first, and then detailed design issues to obtain the explanation in regards the quality of learning environment. The present researcher conducted the interview personally with the interviewee. *Robson (2011)* suggested that face-to-face interviews allow follow-up discussions and responses to be developed, allowing essential data to be collected from the interviewee.

One of the disadvantages of the interview method is that it is time consuming *(Robson, 2011)*. To avoid wasting time in this research; the interviewee was selected carefully for their experience relevant to the research. The department of establishment and planning has responsibility for designing, construction and maintenance of the public educational buildings in Kuwait. The Director of Design department was chosen for interview to collect a clear explanation of the research findings to fulfil the research criteria. Arrangements were made to conduct an interview face to face, which involved:

- Preparation for the visit and arranging appointments in advance.

- Questions designed and handed to the interviewee.

- The research equipment prepared which including audio recorder, DSLR camera and paperwork.

During the interview stage, fundamental data were collected from The Establishment and Planning department. These data were not published and intended to be used within the school design prototypes. The collected documents included the spatial requirements in Kuwait for all school levels, such as the recommended building facilities and special

requirements for each school, and some current school plans in Kuwait, these documents are reviewed in Chapter six (See Appendix I).

Data collection and analysis

The procedures for gathering data and the analysis approach are discussed in this section. The research procedures began by identifying the schools' calendar from the Ministry of Education to choose the most suitable time and avoid the busy and examination periods. Between December and January is an appropriate time to have access to Kuwaiti public schools. The research materials and forms were prepared in advance following the Birmingham City University regulations about ethics. In Kuwait, formal permission to access to the selected schools was obtained from the Department of Research and Development in the Ministry of Education (See Appendix J). The permission was granted by the Assistant Undersecretary for Public Education for each region to obtain the permission to access schools. The research was conducted between December and January of 2012-2014, both the pilot study and main case studies were undertaken within this period, while the interviews were completed by April 2014.

The analysis strategy was based on a sequential 'mixed method' approach which started first with quantitative evaluation, then specific findings into qualitative analysis to draw in-depth details *(Creswell, 2009)*. Thus, the investigation analysis depended on the research methods that applied. First how the physical environment was designed through the physical survey was reviewed. Second, how the environment functions and affects the users was assessed through the observation. Third, the questionnaires to examine how did the users feels about their physical learning environment were analysed. The outcomes of the surveys were enhanced by analysing the interview with the government representative. Figure 26 shows the overall structure of the research analysis strategy, which is based on different approaches for each method. The explanation of these analytical techniques is documented in the following sections.
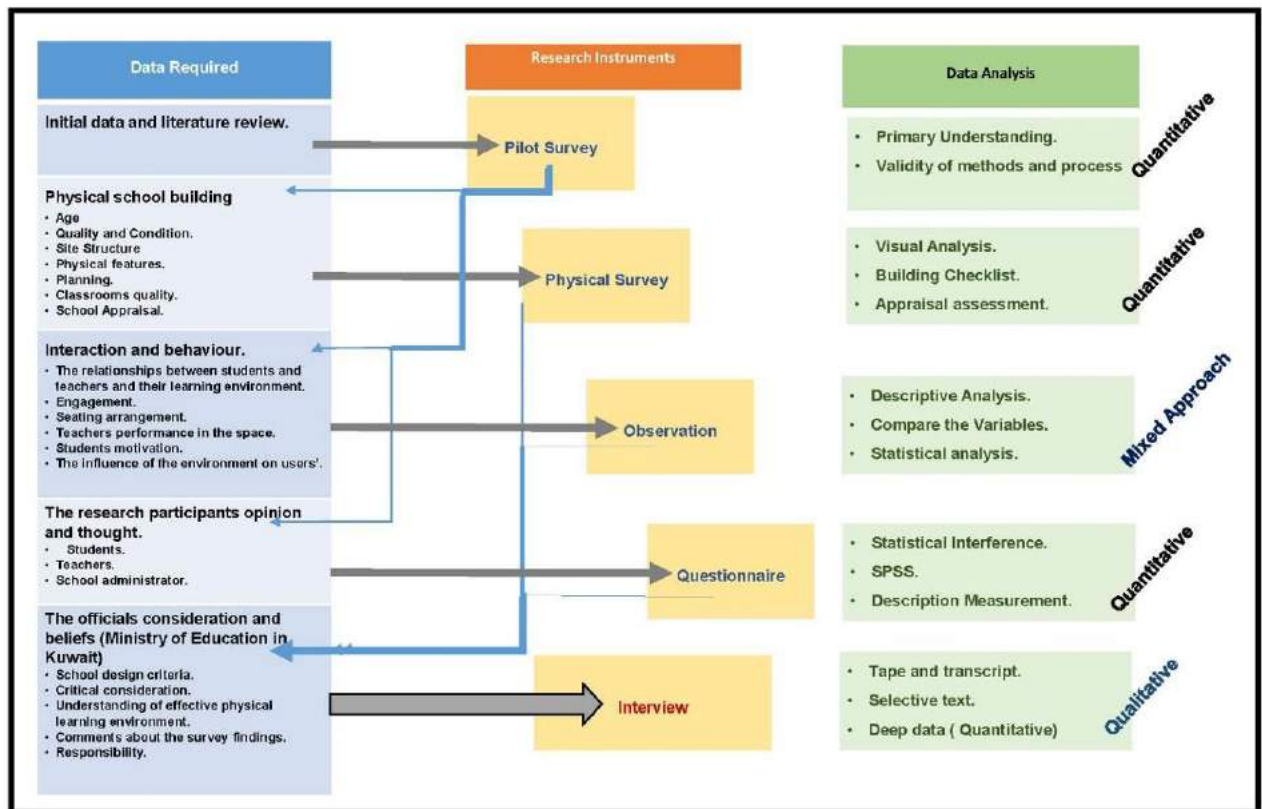
Figure 26. Analysis strategy and data required for this research.

Design and analysis of pilot study

The pilot study sample involved students only, as they were the main focus of this research. Students were asked 10 structured questions, covering overviews, concerns and problems of their learning environment, with an open-ended notes section trying to obtain suggestions and their experiences of their learning environment (see Appendix A). The descriptive analysis, through ordering the data into categories, added to the final results and identified the main emergent points. Charts and graphs were used to present the results as the questionnaire sample was not large, no software been used to analyse the data.

The analysis of this method is focused generally on the understanding of the objectives and values, and checking the validity of proposed methods and the procedures of data gathering. *Yin (2014)* suggests starting the analysis in small sample to identify the initial outcomes and considerations for the main methods. Thus, the pilot analysis drew critical outcomes that needed to be considered for the main survey.

Design and analysis of the case studies

After selecting the schools for the case studies, the school buildings were evaluated according to their age, location and design prototype, based on different socio-cultural issues and geographical area. The school categories considered are those built between 6 to 30 years ago; majority of the older schools had been refurbished. The chosen schools were located in different locations and regions in Kuwait: the Ebn Al-Tofail School and Al-Shamlan School are located in Al-Jahra region; the Al-Wohaib School and Mohalhal Al-Modaf School are located in the Hawally region close to centre of Kuwait, and the Ahmad Al-Saqaf School is a newly built school located in a new residential area called Jabir Al-Ahmad.

The visit procedures were similar for all schools, including meeting the school administrators in their office, showing them the access letter from Ministry of Education, and discussing the research objectives and methods. The first observations were made during the school time, while the physical survey was undertaken after school time. Typically, the researcher was introduced to the teacher by the school deputy who organised the attendance to the classes.

Physical Survey

The physical surveys were completed after school time, for which permission was granted. Two visual analysis models were used together for the physical survey data; first was the analysis of the classroom structural condition checklists (see Appendix B), which examines the physical features quality of the classrooms in each school. The second model is the school facility appraisal (Appendix C), which was developed by *Hawkins and Lilley (1998)* who suggested that the analysis of this guide needs a familiarity with the schools program, plan and layout to inspect the six categories shown in Table 7. As mentioned in Appendix C, prior to the appraisal process, the researcher reviewed the educational program with the administrator, then recorded the number of students, teachers and details of the faculty under inspection. In addition, before approaching the school site, the researcher watched the traffic patterns, school safety signs, and the neighbourhood environment. Therefore, the summary of this appraisal is developed for each school to characterise the overall level of the school quality.

Table 7: The scoring point for each category of School facility appraisal (Hawkins and Lilley, 1998, p.61).

Maximum Points Allotted	Non-Existent	Very Inadequate 1-29%	Poor 30-49%	Borderline 50-69%	Satisfactory 70-89%	Excellent 90-100%
5	0	1	2	3	4	5
10	0	2	4	6	8	10
15	0	3	6	9	12	15
20	0	4	8	12	16	20
25	0	5	10	15	20	25

Observation

The interaction and behavioural performance between students and teacher in relation to their learning environment is the core of the observation survey which applied through observing a random series of classes in the selected schools *(Hoepfl, 1997)*. The analysis of the observation has to suit the central purpose which was conducted by using descriptive statistics *(Creswell, 2009)*, where descriptive and inferential analyses were utilized to determine the relationship between the users and their physical environment.

These elements examine the relationships between the students and teacher performance in the classroom environment. Comparing the results between classrooms within all the schools studied aimed to obtain the overall effect of learning environment on users, as well as validate the conclusions, following the mixed methods approach.

School questionnaire

The school questionnaires were collected by school staff, senior tutors circulated the documents to the students. 10% of the sample was collected personally, but the remainder were collected by the school staff and teachers. Because of the limitations of time, the school administrators' assistance was invaluable.

For the purpose of analysis, the school questionnaires was the largest sample in this research. The data was assembled using computer software called the Statistical Package for Social Science (SPSS) which is helpful in analysing large data sample *(Burton and Bartlett, 2009)*. The initially step required was designing the template within the software to insert the collected data systematically *(Robson, 2011)*. A coding system for each questionnaire was designed to create the variable categories for the investigation. Some of the open questions

required separate codes in order to be readable in the SPSS. The data was directly keyed into the software; this approach was time consuming because of the large sample and the variety of responses that needed separate code. After entering the data, checks were carried out for identifying missing data and proof reading texts to avoid errors in analysis.

Basic descriptive measures were conducted to measure two types of data: exploratory and confirmatory. Exploratory measures focus on what the information tells about the research area, for example the level of satisfaction of the students and teachers in their school environment. Whereas confirmatory analysis emphasises the purpose of the investigation in the selected schools and was conducted after the exploratory analysis.

Design and analysis of interview

The interview with the official representative of the Ministry of Education in Kuwait was the last research tool after the case studies. The director of department of architectural design, who had been in this position from 1995, he was happy to meet and discuss the research objectives, responding to the questions and concerns regarding the learning environment in Kuwait. The interview was completed in two separate sessions on consecutive days. The interview was semi structured, with some open-ended questions prepared in advance, but enabling the interviewee to speaking freely; many of the questions were answered without direct prompting. The interview was conducted in Arabic and then translated with the permission from the interviewee before recording the discussion. He was reassured about his rights during the interview, for example his right to not answer any questions and to withdraw at any time.

To analyse the interview responses, selected passages and texts that were relevant to the research objectives and the data needed were identified from the interview transcripts as suggested by *(Robson, 2011)*. The descriptions were divided into two parts, first to seek answers to the research question, and second to evaluate the interpretations of the conclusion.

Summary of chapter four

This chapter discusses the methodological approached used in the research, illustrating the vision of the research and how the investigation was structured. The mixed research approach was utilised since it was the most flexible and suitable for the acquiring information. This investigation examined two main issues: the quality of the learning environment in Kuwaiti public schools, secondly, the influence of the physical learning environment on students, teachers and staff experience and behaviour. Three main research methods were used to collect the required data: the pilot study, the main survey and the interview. The design and analysis of each method followed a systematic approach that began by overall quantitative data to direct the investigation for details qualitative outcomes. The next chapter would focuses on the state of Kuwait and the development of the education from traditional to contemporary periods.

Chapter Five

The development of the learning system and the learning environment in Kuwait

The design of the research

Background study:	Identifying the gap in the existing knowledge to validate the research proposal
Aim and objectives:	To develop a better understanding of the interrelation of physical environment and learning performance
	Identification of important physical elements/factors which have important bearing on learning environment

Exploring socio-spatial organisation of learning environment

Examining feature that characterises the learning environment

Assessing the mechanism of integration of all socio-physical factors in learning environment

Conduct a Pilot Studies in random schools in Kuwait to obtain an initial data and check the methods

Literature review:

Promoting the approach of the study and developing a conceptual framework for the research

Research concept — Research questions — Research strategy

Empirical work: — Establishing criteria for the case study

Tracing the physical and environmental characteristics of selected schools

Examine the students' performance and motivation in each school

Comparative analysis of the collected data from the case study

Conclusion:

Responding to the research questions by summarising the findings and suggesting the research implications for practice and research

5 The development of the learning system and the learning environment in Kuwait

Overview

Kuwait is a small wealthy Arab country located in the Middle East; it has population of three million people. Kuwait is one of the oldest countries in the region, recognised as an important trading station for traders from the East, Europe and America *(Al-Alrasheed, 1987)*. People from many backgrounds moved to Kuwait, which had a significant impact on the social and cultural life *(Al-Eidrous, 2002; Al-Qonaim, 1999)*. The Kuwait economy depends on its oil reserves, and is the fifth largest petroleum product exporter in the world *(Factbook, 2016)*. These characteristics played a fundamental role in building the culture, economy and social life of Kuwait. However, Kuwait's government currently faces economic challenges that having considerable effects on its education, trade, cultural, social and technology *(M.O.E, 2008)*.

This chapter aims to review the development of Kuwait as a nation, and then address particularly the circumstances of its educational systems and learning environments. Identifying the historical background to clarify the social, cultural and economic growth is necessary to discuss its influence on educational development. This chapter is structured as follows:

1. A brief background history of Kuwait,

2. The development of the socio-cultural, economical and the educational system in Kuwait,

3. Existing school buildings design and architecture.

5.1 Brief background history of Kuwait

Location and environmental conditions:

Kuwait is located in the south-west Asia region in the middle of Persian Gulf, which is central to the Gulf countries (see Figure 27). Between latitudes °28.30' - °30.06' north and between longitudes °46.30' - °48.30'east *(infoplease, 2000a)*. Kuwait is bordered on the north and west by Iraq, on the east by Persian Gulf and on the south and west by Saudi Arabia, this strategic

Figure 27: Kuwait Geography (Factbook, 2016).

location plays a significant role in relation to its neighbours *(Al-Sorour, 1993; Factbook, 2016; Central Statistical Bureau, 2013)*.

Kuwait is one of the smallest countries in the world, totalling almost 17,820 square kilometres (6,880 square miles) including islands. The habitable land area in Kuwait is just 8% of what otherwise is a desert area. Kuwait's terrain is a very arid and flat landscape and has nine islands located to the east, the biggest island is Bubiyan; all islands are inhabited except Failaka *(Encyclopaedia Britannica, 2013)*. Kuwait bay is a significant landmark, it is a deep water harbour allowing entry to the ships from Indian Ocean and Arabian Sea making the export of oil easier *(Central Statistical Bureau, 2011)*.

The country is a low lying sandy geographic region, centred within the Arabian dry desert area, it has intensely hot summers and a short cool winter period *(infoplease, 2000a)*. Temperatures in Kuwait can rise to more than 50°C in the summer season, dropping down slightly in autumn to 30°C decreasing gradually to 5°C in the winter. The spring season in Kuwait is quite hot similar to its summer temperatures; high winds called 'Sayarat' increase in spring through to summer *(World Weather Information Service, 2012; Central Statistical Bureau, 2013)*.

Demographics (population, genders, ethnic groups and religion)

Table 8, shows the Kuwaiti population in 2011 as around 3.06 million, as shown in the annual statistical report from the central bureau. However, 60-65% of the population is non-Kuwaiti; these people are mostly settled in Kuwait working in governmental positions such as teachers, doctors, and construction workers.

The population growth rates in Kuwait from 1965 to 2011 have fluctuated, indicating an increase in population percentages from non-Kuwaiti citizens. The non-Kuwaiti population rate is not stable; between 1965 -1975 the growth was greater as Kuwait became independent and career opportunities were available for foreigners who were encouraged to settle there. Between 1985 and 1995, the non-Kuwait residents decreased by approximately 25%, the Iraqi invasion into Kuwait in 1990 affected this, whereas the Kuwaiti population growth rates were between 30-40% of the whole population. Therefore, the population in 2011 has grown and it is expected to rise in next few years. Figure 28 classifies the details of the population growth *(Central Statistical Bureau, 2013; KGO, 2008).*

Table 8. Population growth in Kuwait between 1965-2011. Source (Bureau, 2013)

Population by Nationality in Selected Census Years

Year	Kuwaiti	Non-Kuwaiti	Total	% of Kuwaitis
1965	168,793	298,546	467,339	36.1
1975	307,755	687,082	994,837	30.9
1985	470,473	1,226,828	1,697,301	27.7
1995	653,616	921,954	1,575,570	41.5
2005	860,324	1,333,327	2,193,651	39.2
2011*	1,089,969	1,975,881	3,065,850	35.6
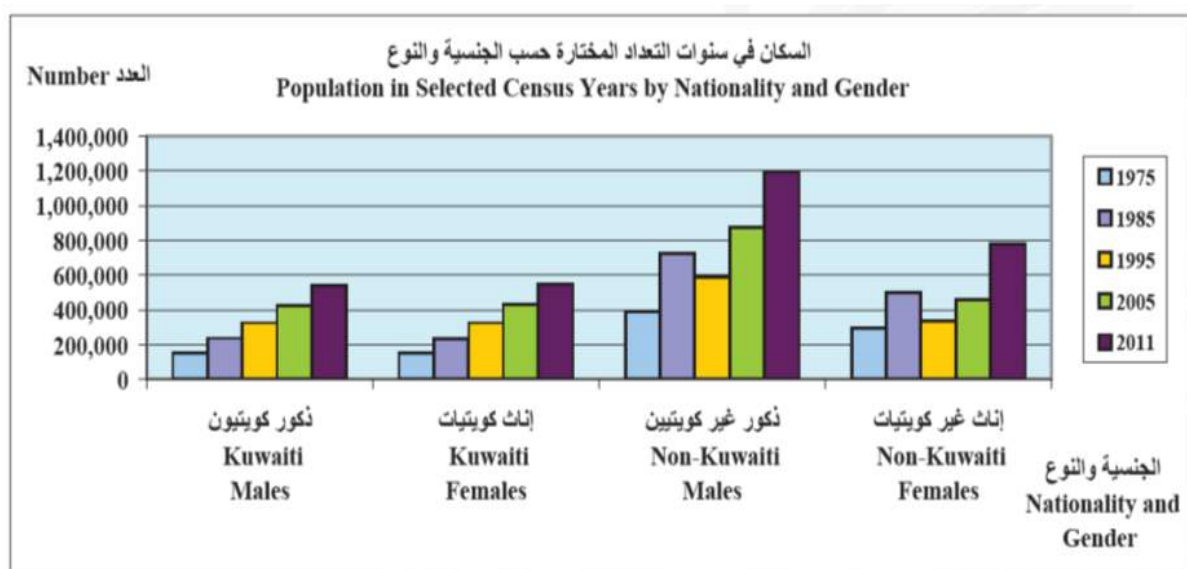
Figure 28: Population gender and nationality in Kuwait (Central Statistical Bureau, 2013).

As seen in Figure 29, the greater proportion of Kuwaiti age groups are younger people: from infants to 24 years; the largest percentage for infants-babies under 4 years of age, decreasing through the age range to children, teenagers, youth and then middle aged people. The age group considered in the present research is teenagers between 10-14 years; they form 11.6% of the whole Kuwaiti population *(Central Statistical Bureau, 2011)*.
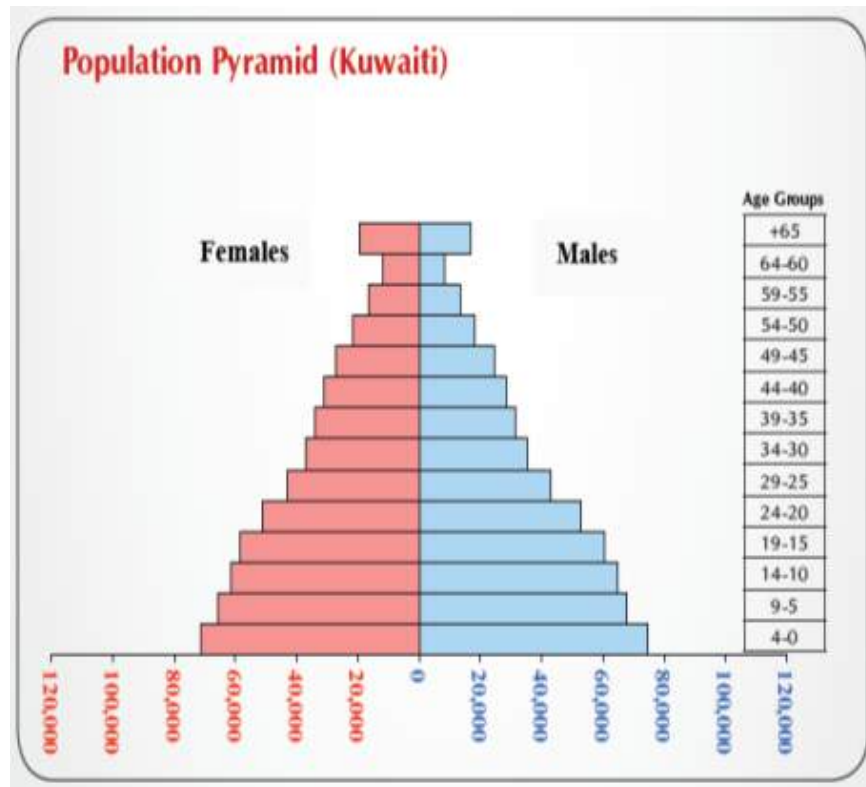
Figure 29: Kuwaiti population pyramid (Statistical Information Bureau, 2013).

The ethnic groups in Kuwait are quite limited. 58% of citizens are Arabs including the Kuwait citizens. The Asian groups constitute 37% of the population, which includes Indian, Pakistani, Bengali and Philippian. 5% are foreign residents of European, Iranian, and African origin. The formal language in Kuwait is Arabic, and is used in governmental institutions, public schools and health centres. However, English is widely spoken and could be seen the second language, as a majority of Kuwaiti citizens speak English well in shops and markets, especially in the younger age groups *(Factbook, 2016; infoplease, 2000b; infoplease, 2000a;Theyab, 2010)*.

The majority of Kuwaiti people are Muslims, and the Islamic doctrine in Kuwait consists of almost 60-70% Sunni Muslims and 30-40% Shia Muslims. The Ministry of Justice is based on Sunni law but there is a Shia law department (Almahkama Aljafariya) that considers the

Shia law for Shia citizens. 15-20% of Kuwaiti citizens practise other religions, such as Christianity, Hinduism and Baha'i *(Human Rights and Labor, 2012)*. All religions in Kuwait are respected by the government and each person has the right to practice their religious rituals freely *(Factbook, 2008; Human Rights and Labor, 2012)*.

5.2 The development of the socio-cultural, economical and the educational systems in Kuwait

This section covers three periods in Kuwaiti history that illustrate the development of the social, cultural, economic, and architectural movements. The educational system and the learning environment development situation is then discussed. Table 9 summarises these three periods.

Table 9. Historical development of Kuwait

The historical development of Kuwait		
First period	**Second period**	**Third period**
Toward 19th century	Early 20th century	Since the end of the 20th century to the present time
The traditional Education (Mosques and Al-Al-Katatib)	Formal educational system (Establishment of the Ministry of Education)	The contemporary educational system (Official Education)

First period: The Historical development of Kuwait up to the 19th century.

'Kuwait' as a name is originally based on the old place name *Alkot* which means small fortress or castle in Arabic language (see Figure 30). This particular castle is located on the edge of the beach on the Persian Gulf, which sheltered ports for sea travellers *(Al-Eidrous, 2002),* making Kuwait a transit stopping area for sea travellers. 'Alkot' was built between the 11th and 17th centuries. Kuwait was an important harbour for the ships to take shelter *(Al-Alrasheed, 1987).*

Figure 30. Kuwait's harbour in 1760, which clearly shows in the middle of the image the small fortress (Alkot). (Source: Asad Abunashi, 2007)

Due to the uniqueness of geography, culture, economy, politics, and future prospects of Kuwait (see Figure 31), its history Kuwait was affected by its surrounding geography, which linking it to the Gulf countries and Persian Gulf *(Al-Haji, 2004).* Kuwait was coveted by different Empires and groups in power from 17th century, like the Persian Empire, Arab tribes and Qaramita Islamic groups, which influenced all the Gulf countries, and especially Kuwait, that led to the negotiation of a settlements with the British government at the end of the 18th century.

Figure 31. Location of the state of Kuwait within Middle East (Factbook, 2016).

One of the Kuwaiti's islands is Failaka as shown in Figure 32, which was first inhabited by the Mesopotamians, known as the Dilmun civilisation who lived on the island in 2000 BC. Mesopotamia was an ancient region that located in Iraq, Syria and Turkish border, between two rivers linking between the Tigris and Euphrates rivers *(JSTOR, 1979; Al-Haji, 2004; Mark, 2009)*. Archaeologists found on Failaka a Greek settlement built by Alexander the Great (356-323 BC); there are still ancient building remains on the island (see Figure 33). Kuwait was under the control and influence of different previous empires, in 123 BC it was under the influence of the Parthian Empire. Later, Kuwait was the under control of Sassanid Empire in 636 AD. There was a battle between the Rashidun caliphate (Muslims) and Sassanid Empire (Neo-Persian) in a place called 'Kazma' in Kuwait (see Figure 32); which resulted in the Rashidun victory in the 7th century. Kuwait was then controlled by the Kingdom of Al-Hirah as a Muslim region, from the century Kuwait became famous as a trading nation *(Casey, 2007)*.

Figure 32. Kuwait map that show the Failaka Island and Kazma town. (Google maps. 2016)

Figure 33. Greek Settlement at Failaka Islands in Kuwait (Al-Haji, 2004)

Late in the 16th century, Kuwait was under Portugal's control, they built a defensive settlement at Failaka Islands *(Slot, 1991)*. The people who lived in Kuwait at that time received support from the 'Bani Utbah' clan who supported them in establishing the state of Kuwait, which joined the Othman Empire in 17th Century. The 'Bani Utbah' were a group of Arabs from the Aniza tribe who migrated from the Najd region of Saudi Arabia, after drought and famine. They moved to the Persian Gulf in 16th century in order to find better way of life there, they mixed with the local Kuwaiti community at that time *(Casey, 2007; Al-Haji, 2004; Floor, 2006)*.

The development of the nation of Kuwait before the 18th Century remains unclear; there are no references in historical sources mentioning Kuwait earlier than 1645 *(Slot, 1991)*. According to *Al-Alrasheed (1987)* the creation of the state of Kuwait was in 1613 AD, while *Al-Qenaeey (1988)* mentioned the formation of the state of Kuwait was later, about 1690 AD.

In the 19th century, Kuwait was under threat from powerful surrounding nations. The Al-Sabah rule strategy was based on diplomatic system that avoids military and hereditary claims; Kuwait signed a general treaty of peace with British in 1820 *(Al-Sorour, 1993)*. It emphasised that Britain had no control of the foreign policy of Kuwait. That agreement provided greater freedom for Kuwait within the region and the political position with other Arab countries *(Alghanim, 1998; DiPiazza, 2006)*.

Social and economic development.

From the late 18ᵗʰ century, Kuwait became a major centre for trade in the region. The type of professions and trade had a critical influence on this development of the economy *(Al-Haji, 2004)*. The strategic location of Kuwait allows for extensive trade, business and career opportunities. Families in Kuwait were divided to:

- The merchant family: those who own a trade, shops and businesses. They used limited sources of trade due to the poor communication and facilities that were available at that time, like importing food from Iraq, trade in pears, horse trading and sailing ship construction. Importing variety types of woods from India was common, especially since they were used in the construction of wooden ships.
- Skilled artisan's families: those who run their own business like carpenters and home builders.
- Workers' families who are employed on certain jobs with the merchants in their trade or skilled professions.

Although Kuwait is classified as having a small population, it has a diverse cultural background due to the influx of immigrants *(Al-Alrasheed, 1987)*. These people brought their culture and beliefs, which became integrated. The tribal groups (Badu) who are the majority in Kuwait came originally from Najd, the centre of Arabian Peninsula and Syria. The non-tribal people came from Iraq, emirates and Bahrain. Non-Arab groups also came from Iran *(Alenizi et al. , 2008).* The Kuwaiti cultural values are based on hospitality, loyalty, courage and gallantry, but the ways that they represent those values are different between the non-tribal and tribal community *(Theyab, 2010)*. According to *Al-Husaini "Kuwaiti culture is a collectivist culture when compared to the cultures of other nations. However, if the comparison is narrowed to Kuwaiti society it-self, tribal culture is a collectivist culture and non-tribal culture is an individualist culture" (Al-Husaini, 2004,p.25).*

In early of 19ᵗʰ century, the nature of the economy and trade in Kuwait developed, with the merchants from Persian Gulf, Basra, India, Africa and Iran bringing their business to the state. The cooperation between British officials and Kuwaiti ruling family were important. The British factories moved from Basra to Kuwait due to conflicts between British and Turkish officials who were controlling Iraq at that time. Then Kuwait became independent, with some source like water supplies, which previously had been obtained from Iraq. These factors

influence the economy of Kuwait and created opportunities for people to work in these factories *(Al-Alrasheed, 1987)*.

Traditional architecture in Kuwait

The development of traditional architecture in Kuwait reflects the simple style of living for the people between 18th and 20th centuries *(Al-Bahar, 1984)*. The traditional style of architectural building in Kuwait was influenced by social, cultural and environmental characteristics. The builders (Ustad) developed living spaces without any plan or sketch and created rooms, and their dimensions, with site owners. Additionally, they considered the way that the building would be comfortable for the families while respecting their desire for privacy, and taking environmental conditions into account *(Lewcock, 1978)*.

Figure 34. Atraditional path between houses (Watan-Alnahar, 2012)

Religious and cultural concerns were embraced. Each building was surrounded by a high wall to decrease the heat of the Sun, resulting in paths between buildings that had some shadow for walkers (see Figures 34 & 35). There were limited windows between the buildings to keep the visual and auditory privacy.
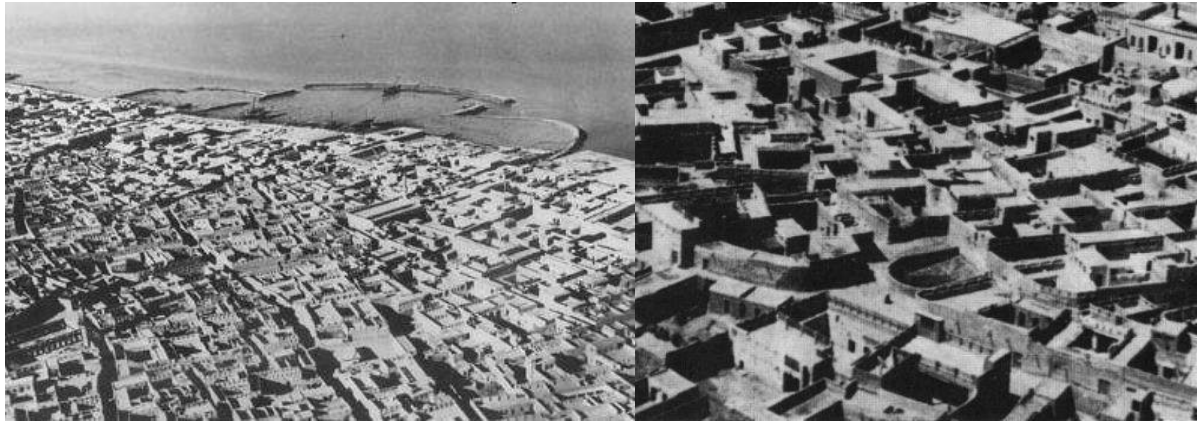
Figure 35. The overview plan of the old Kuwait city which shows the paths between each house (Watan-Alnahar, 2012)

Courtyards had an important role in traditional buildings, being located in the middle of the site, with other rooms located in the wings. Some buildings had multiple courtyards such as found in schools and hospitals (see Figure 36). The courtyards had many functions based on social, environmental and sustainability considerations *(Al-Bahar, 1984)*. The social aspect of the courtyards allows people to gather with their family and friends. The courtyard is also an effective way of circulating the air inside the nearby building, and prevents dust and sand to enter *(Lewcock, 1978)*. Courtyards have also been used as a learning environment within the traditional education.
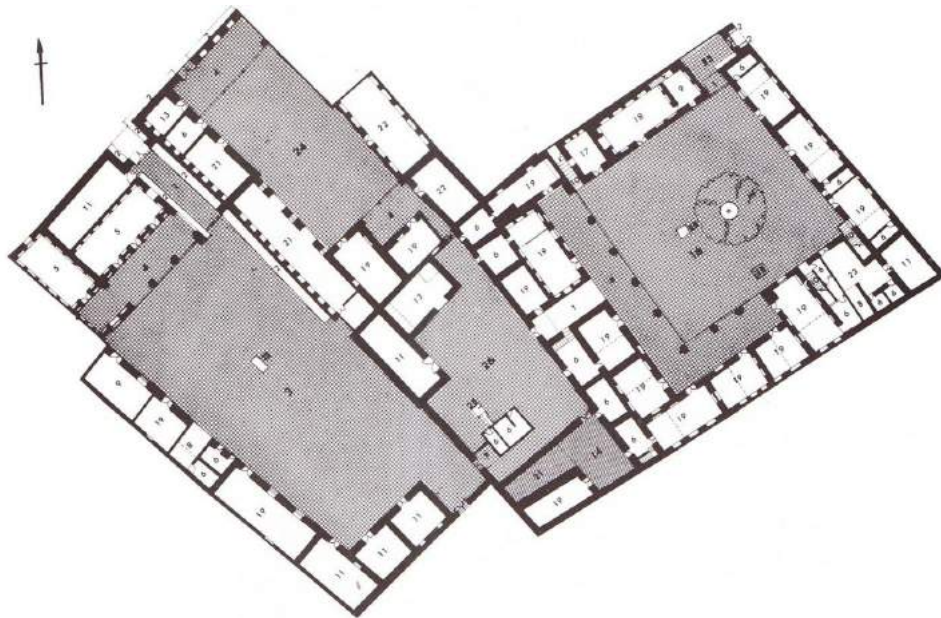
Figure 36. The layout plan of the historical building in Kuwait (Al-bader house) that shows the multiple courtyards in same building area (*Lewcock, 1978*)

The materials used in most of the buildings in Kuwait were mud, wood, limestone, gypsum, coral and mangrove poles *(Al-Haji, 2004)*. The wall and blocks used mud clay which was sufficiently strong (see Figure 37); these walls also worked as thermal insulators which were cold in summer and warm in the winter. Timber wood such as hard teak wood were used to build the doors and pillars and were imported from Iraq and India *(Lewcock, 1978)*.

Figure 37. A traditional building in Kuwait (Kuwaitpast.com)

Traditional education

Kuwait was a small and poor country before 19th century; the people were struggling to earn enough money to live. The majority of Kuwaiti people were illiterate, only a minority of people spoke foreign languages and were able to do basic mathematical calculations *(Al-Qenaeey, 1988)*. Children under 6 years old were not taught formally; they usually stayed with their families at home and played with their neighbours outside (see Figure 38), where they gained their basic understanding of traditional customs *(Al-Haji, 2004)*. Formal education was not paid enough attention in the political system or the Kuwaiti people in the early history of Kuwait. Rich families were able to fund education but this was not provided for all people, as discussed in the literature review (Section 2.4).

Figure 38. Kuwaiti children playing outside of their houses with some traditional toys, children were required to cover their heads when they started attending traditional schools (Al-Haji, 2004.)

At the end of the 19th century, and because of its geographical location, Kuwaiti people interacted with many traders and travellers from Arab countries and India. From this period their desire was to provide better communication and business opportunities. Concerns about education in Kuwait were raised by the community who saw that only a basic education was required and children had only a rudimentary education. The development of the traditional education system gradually became more available for all the community *(Al-Eidrous, 2002)*.

Two places that Kuwaiti's use to gain knowledge are mosques and Al-Al-katatib. The mosques (Masjid) offer religious instruction. The formal religion of the Kuwaiti people is Islam and Islamic countries calling the community to be educated in the science, religion, and general subjects. Masjids are an important place for Muslims which function as sites not only for pray or religious practice, but are also used as a teaching environment. The religious people who came from Iraq and Al-Ihsaa (Saudi Arabia) taught Islam, the Quran, and Quotes about the Prophet Muhammad *(Al-Eidrous, 2002)*.

Al-Katatib sites are run by an educated person 'Al-Mulla', who takes the responsibility to teach the children the Quran (Muslims' religious text) and memorize by practice the quotations of the Quran text. Children's families and some of the merchants began funding poor families to be

Figure 39. Al-Katatib classes (DiPiazza, 2006)

educated in these classes, which also taught basic reading and writing, literacy and numeracy skills and general knowledge (see Figure 39). The cultural and traditional concerns of the Kuwaiti people lead to complete segregation of male and female children within education. Female education was very limited compared to the male classes *(Al-Eidrous, 2002)*. Additionally, these classes also concerned ethical and moral education, and allowed parents to punish the children if they did not show respect to others or did not complete the set tasks. This was often manifested by physical punishments, reasons that children disliked the classes at that time *(Al-Qonaim, 1999)*.

The physical organisation till the 19th century is shown in Figure 40, was in similar organization to the contemporary school classroom arrangement. The teacher is situated in the middle of the courtyard, with the children sitting in front of him in rows. Each student was given a pen, and a wooden board painted with glossy paint; children practiced writing the Arabic alphabet on such boards which can be cleaned, and re-used, easily. There was no furniture, just a traditional lectern for the teachers, and a small wooden box for each child to store their boards, which could also be used as a seat making it more comfortable than sitting on the floor. Water was available (see Figure 40) for the children to drink once permission was asked of the teacher.

Figure 40. The organisation of the spaces in Al-Katatib classes (Kuwait TV)

Second period: The state of Kuwait and its educational movement within the 20th century.

The relationship between the state of Kuwait and the surrounding countries was based on respect and a sense of brotherhood following religious and cultural values. The Al-Sabah family shared the responsibility with the people about the Kuwaiti political and economic issues at that time, which built a strong society that persists to this day *(JSTOR, 1979; Al-Eidrous, 2002)*. At the end of the 19th century and beginning of the 20th century, Kuwait preserved its independence from external aggression. Strong borders were built over a long time period; the first defence border was built in 1760 and was about 750 meters in length. Further borders were built in 1814. A third border was built in 1920, it was five miles in length, running north-south to Kuwait's sea border, at around five meters tall it was the largest physical border constructed in Kuwait's history. It had five gates, and defended Kuwait from the attack from Saudi Wahhabi forces in 1920 in the Al- Jahra desert Battle *(Al-Qenaeey, 1988)*. These gates as shown in Figure 41 still exist across the Kuwait city as symbols of freedom and power, to remind the citizens about Kuwait history.

Figure 41. Al-Jahra gates that have been refurbished, but still exist in Kuwait

Socio- cultural and economic developmennt in this period.

The social transitions within the 20th century were clear, with people paying attention to education and improving their skills. A significant occupation in Kuwait used to be collecting pearls, for exporting worldwide during the 18th century. That improved the quality of life till 1930, but later the pearl trade dropped dramatically because of the import of Japanese cultured pearls *(Al-Qenaeey, 1988)*. There were other skilled artisans who undertook

professional skilled jobs, including the carpenters who constructed sailing ships. Iron workers provided the materials for the ships' construction and for household items. There were also the goldsmiths, silversmiths and cloak makers (see Figure 42) who worked in the urban environment *(Al-Haji, 2004)*.
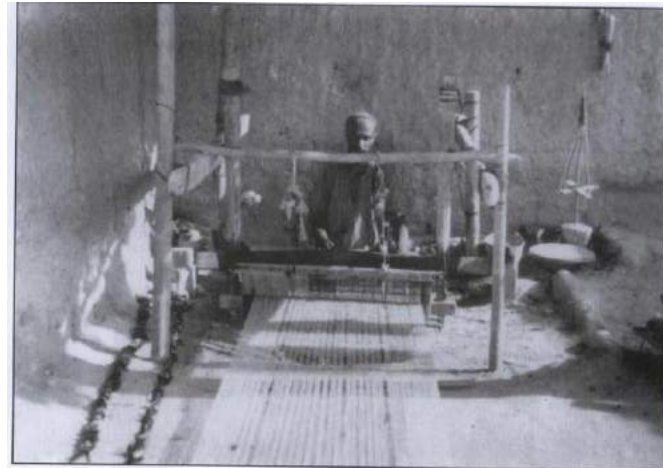
Figure 42. Cloak maker using a handmade machines to produce traditional clothes *(Al-Haji, 2004)*

A key change that happened for Kuwait in terms of the socio-economic profile was the discovery of oil. In the 1930s many reports mentioned the existence the oil in Kuwait. The president (Sheikh) of Kuwait collaborated with foreign companies to start oil exploration. In 1938 the first oilfield in the Burgan area was discovered, which promised vast oil reserves. The organisation, exploration and export of oil to other countries started in 1946, which speeded up of Kuwait development *(Kuwait petroleum Corporation, 2016)*.

Architectural development in Kuwait in this period

The traditional architecture in Kuwait was based on a vernacular layout design, depended on the cultural and social requirements as discussed in the first period. Before 1950 settlements were surrounded with protective walls and gates and houses were built in lines with long narrow street layouts appropriate to the cultural and social needs at that time *(Mahgoub, 2004)*. This vision changed after 1950 into more contemporary and modern architecture *(Anderson and Al-Bader, 2006)*. The Kuwaiti people were enthusiastic about transforming the old vernacular settlements into a modern built environment. *Asfour (2004)* stated that the Arab countries including Kuwait adapted modern architecture as a way to move from the traditional to the modern living style to convey a twentieth century approach.

However, little consideration was given to the use of modern architecture in hot countries. *Asfour (2004)* emphasised that the modern architecture styles might function in western cultures, but are not always suitable in the Arabic cultures. The modern architecture in Kuwait has been influenced with the basic form of western architectural identity. That movement had many goals *(Mahmeed, 2007)*:

1. Development of modern roads and street systems appropriate to traffic needs, linking Kuwait city with other towns.
2. Building a city centre with suitable public services like schools, hospitals, and public buildings.
3. Formation of new residential sites for housing, space for industrial and production, and commercial areas.
4. Providing dedicated spaces for public parks, sporting activity and playing fields, and enriching the city with plants and green landscape areas.

To transform Kuwait City, the government collaborated with British firms in 1950 to create the first plan for the urban space (see Figure 43). The majority of the old buildings were demolished in order to create space for the modern city to be built *(Anderson and Al-Bader, 2006)*. Then, many developments occurred later on to improve the city centre to suit the ongoing growth of Kuwaiti population and economics *(Mahgoub, 2004)*.
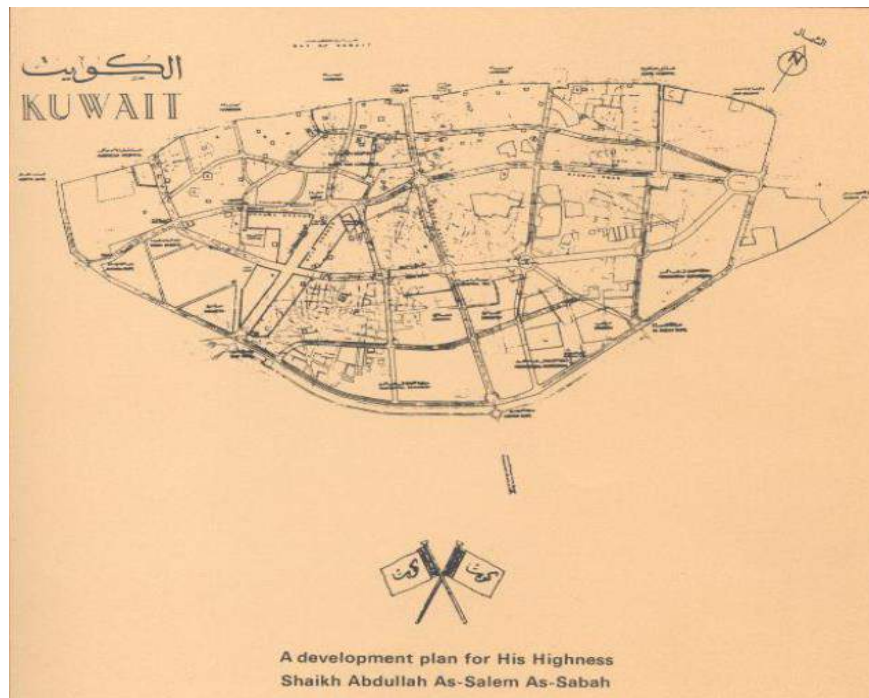
Figure 43. The first plan of the Kuwait that created by a British firm in 1950 (Mahmeed, 2007)

Between the 1950s and 1970s the architectural development of Kuwait was undertaken by non-local architects, engineers and contractors who did not understand the regional culture or identity. *Al-Bahar (1985)* stated that there was an architectural failure to recognise the Kuwaiti cultural identity and ignored the traditional design elements, this originated from the early period of the discovery of oil (see Figure 44). *Mahmeed (2007)* mentioned that even then the Kuwaiti people did not recognize or identify with their own architectural features, it appeared that the modern architecture did not belong to the historical vision of Kuwait.

Therefore, borrowing ideas from western architecture and copying the design styles were common within the Arab countries, as the architect's beliefs apply these design styles enhance the aesthetics elements into the traditional architecture. Replication of the foreign vision in architecture has no universal applicable values, but just create an impression of development *(Mahmeed, 2007)*.

Figure 44 Modern house design 1950 -1970 *(Cecil, 2014).*

The developments of the educational system, and school buildings in the 20th century:

The previous section identified the development movement of the architectural and design identity in Kuwait within 20th century. This section discusses the establishment of formal education in Kuwait and the formation of the Ministry of Education. Then, the discussion about the development of the learning environment in Kuwaiti old schools is outlined.

The influence of importing the foreign vision in Kuwaiti environment, and the economic growth in early of 20th century, affected the development of the education system through curricula and strategies used in foreign systems not necessarily suitable for Kuwait *(Al-Haji, 2004)*. Therefore, the people of Kuwait began to pay more attention to educational styles appropriate for them, which developed a greater variety of subjects such as literacy, maths, language and health *(Al-Qonaim, 1999).*

Development of a formal education system started in this period and developed in two phases: a first phase organised by the people of Kuwait including merchants, educated people and leaders. The second phase involved the establishment the Ministry of Education which is still exists as a government authority.

In 1911, the first formal school was launched in Kuwait. This became the foundation for improving the education system *(Al-Qonaim, 1999)*. The Al-Mubarakiya school was founded by Kuwaiti people, merchants and the ruling family, who provided the finance for the school. The traditional education teachers (Al-Mula), had the responsibility for teaching and creating the curricula in this school. The school was built within nine months by local builders (Ustad) and run by educators like Yosef Al-Qinaei, Shieh Nasser Al Mubarak and Yassin Al-Tabtbaei *(Al-Eidrous, 2002).*

The success for the first school acknowledged the importance of education. The Sheikh of Kuwait asked that the curriculum of the Al-Mubarakiya school should include new sciences and English language subjects. But parents and the school leaders did not see the need for this because of the lack of resources and facilities available at that time *(KCRS, 2002).* It was then proposed to build another school involving a wider range of subjects without changing the regulation and system of the Al-Mubarakiya school. In 1921, the Al-Ahmadiya school was built which had larger buildings sizes and facilities *(Al-Haji, 2004).*

Establishment of the Ministry of Education

The Kuwaiti people and educators believed that the educational system was in need of significant development, and so in 1936, the Kuwaiti Knowledge Council was formed and managed by government; this council was the foundation of the Ministry of Education today. This council aimed to raise the standards of the teaching profession, and improve the quality of curricula of the two schools *(Ministry of Education, 2016)*. Many schools were created by the Knowledge Council *(Ministry of Education),* to improve the education standards.

The first formal girls school (Al-Wostaa School) was created in 1937 *(Al-Alrasheed, 1987)*. Girls at that time had only the opportunity to attend Al-katatib classes, which were quite limited in term of subjects taught. The Al-Wostaa School was crucial on educational development for women. In 1945, there were 17 schools *(Al-Eidrous, 2002)*. Other educational institutions and opportunities for education, like independent schools, faith schools, and literary associations also arose. The government started at this period to fund students for study in foreign schools *(Al-Alrasheed, 1987)*. Books were brought from other Arab countries; the production of the curriculum books in Kuwait only started at end of the 20th century *(Al-Haji, 2004)*.

Development of school buildings in the 20th century

The learning environment in old schools, especially in Al-Mubarakiya and Al-Ahmadiya, were inspired by the same traditional vision of building design in Kuwait in the 20th century. Similar considerations were taken into account in term of the spatial design features as discussed in previous section (1ST period). The centre of the school design was the open courtyards that had multiple functions: the space for playing, sport activity, and it was visible from the classroom and other areas of the school.
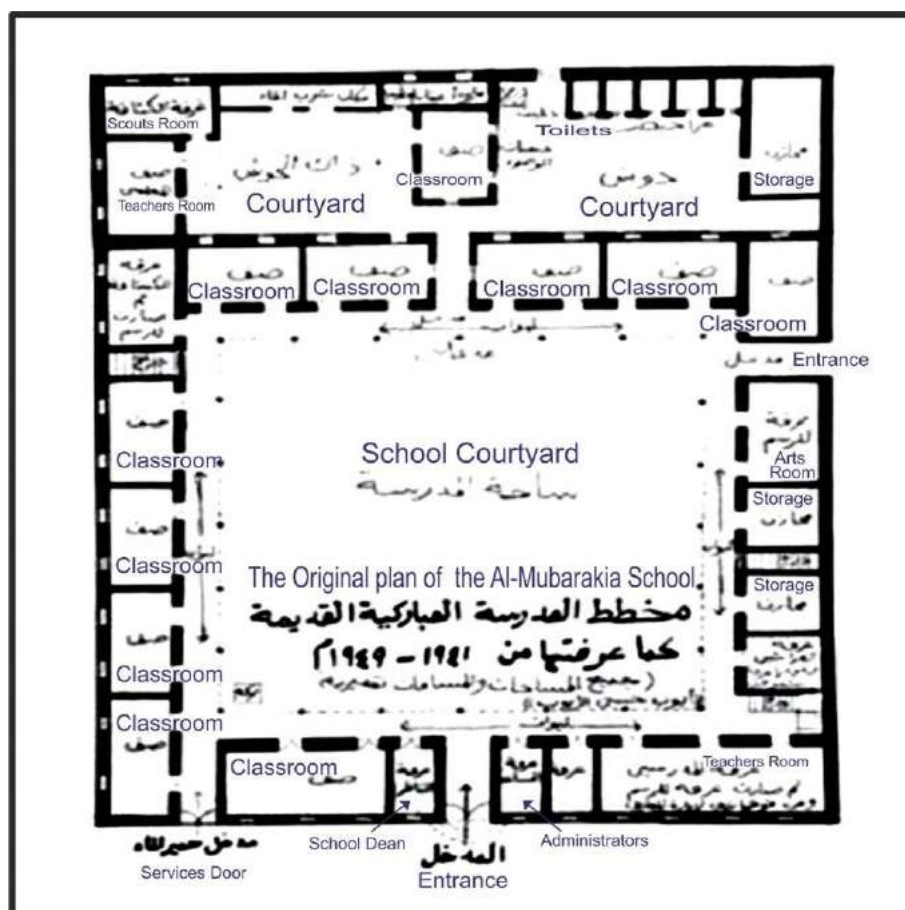
Figure 45. The original plan of the Al-Mubarakiya school *(Ayyub Hussain, 2013)*

The plan of Al-Mubarakiya school (Figure 45) shows the school design, including corridors and classrooms. There was one main courtyard and two smaller courtyards that link the classrooms and other school spaces. Figure 46 shows the traditional design of the school entrance. The right door is the main school entrance used by student and teachers, created with high quality teak wood. The left door is the service door used to remove goods and refuse. Additionally, in term of the spatial design, the main entrance door is located beside the school manager's room, on the left of the main door. That was planned to enhance the school manager's ability to observe the movement outside the school. The windows in these schools had no glass; they were kept closed during the teaching session to avoid the distraction of the students *(Albeshe et al. , N.A)*. The colours used in the old schools were limited; the beige colour originated from using mud clay, a colour suitable for the Kuwaiti weather, as the floor was just compacted sand and mud. Also light blue and brown colours were used for small and detailed features like doors and window in order to protect the wood from the high temperature.

Figure 46. The entrance of the Al-Mubarakiya school; it has two entrances, the right door is the main one (adopted from Ayyub Hussain Drawing)

The corridors, called 'Al-Lewan' as shown in Figure 47, were built with clay ceilings that overhang the windows of the schools and the classrooms' entrances, reducing the direct sunlight on students who were sat there. The ceiling heights were around five meters in the building, the same height as the house walls which facilitates the circulation of air inside the space. Pillars in Kuwaiti schools were made of oak, resistant to the hot weather conditions *(Albeshe et al. , N.A)*. The interior walls of the classroom were built of mud clay, while some classrooms were covered with wood panels (see Figure 48).

Figure 47. Al-Mubarakiya school yard which shows the classrooms and corridors *(Al-Mubalish, 2016)*

Figure 48. A classroom at Al-Mubarakiya school which shows the basic setting and organisation of the space *(Watan-Alnahar, 2012)*

The fixtures of the classrooms were not moveable. The seating inside the classroom was arranged as rows, with students sitting next to each other. Figure 48 shows that the organisation of the space has not changed from earlier of the Al-Katatib classes, placing the teachers at the centre of the classroom with students sitting in front in rows. The furniture provided in these schools was created by a local carpenter using plywood and timber. The students share a bench while the teacher has a personal desk and chair. The space size as shown in Figure 48 demonstrates that the distance between teachers and students is limited, which is planned to support the teachers' ability to manage the classroom. The density of students in each classroom varied depending on the classroom and subject area, the regulations stated that each classroom could accommodate 40 students at a maximum. However, Al-Mubarakiya school in 1951 had a high density of up to 80 students in each classroom *(KCRS, 2002).*

The teaching system was based on traditional methods, using dictation teaching with little interpersonal engagement between students; the teacher delivered the information that students received. The learning environment influenced the student's acquisition of knowledge in the classroom, no learning facilities were provided outside of the school: there

were no workshops or practical-based learning opportunities in the early education curriculum. Science laboratories and technological facility were provided outside the school; for example skilled artisan and craftsmen taught children skills independently and were not part of the educational system *(KCRS, 2002)*.

Third period: The independence of Kuwait and the contemporary educational system

The growth of the oil industry led to the development of the political, economic and life style qualities in Kuwait, changing it from a poor country to a wealthy one. Kuwait became an independent state on 19 June 1961 and part of the Arab League of states *(Al-Nakib, 2011)*. The constitution of Kuwait was created in 1962 when it became a Member of the United Nations. The political system in Kuwait is democratic; and the primary source of control is Islamic law *(Factbook, 2016)*. The exploitation of the oil reserves made Kuwait one of the most important traders in the region, and that encouraged the development of education, transport, culture and so on *(infoplease, 2000a; Central Statistical Bureau, 2011)*.

Iraqi Invasion

In 1990, the Iraqi army invaded and annexed Kuwait; this hindered cultural development, and continues to effect Kuwaiti people socially, psychologically and economically today *(Partrick, 2009)*. The impact of the war influenced architectural development which also affected the appreciation of designing the learning environment, the main focus of this research. *Al-Jaber (1996)* stated that *"The Iraqi army used the Kuwaiti schools as storehouses for their ammunition during the occupation. Some of the schools were used also as army headquarters" (Al-Jaber, 1996,p.1)*. The main impacts of the Iraqi invasion of Kuwait are as follows:

- Environmental pollution was caused by the Iraqi invasion. The Iraqis deliberately burned the oilfields in Kuwait, and wrecked five large oil tankers creating an oil spill *(Al-Sarawi, 1992)*. This polluted the air, sea, and land for at least six months, damaging soil, groundwater, wildlife and marine life *(Al-Shalal, 2013)*.

- The invasion not only damaged the wealth and natural environment of Kuwait, but also literature, architecture and primary art materials were destroyed or lost during the invasion (see Figure 49). For example, the Iraqi army used some government buildings as military barracks, which were demolished during the war. Literary archives were lost, as many libraries and governmental documents were destroyed *(Alomaim, 2016; Alderaiwaish, 2014)*.

Figure 49. This landmark in Kuwait was been damaged after the Iraqi invasion *(almrsal.com, 2014)*

- The Iraqi invasion impacted education, as educational buildings were re-purposed as military centres, destroying the infrastructure of the buildings themselves, and teaching also stopped (see Figure 50). After the liberation of Kuwait, the Ministry of Education encouraged students to return to school immediately. Two academic years were condensed into one in order to compensate for lost time during the invasion. The curriculum was changed, retired teachers were brought back into teaching to restore the education levels more quickly *(Al-Jaber, 1996)*.

Figure 50.One of the damaged school after the Iraqi invasion that had been used as military centre
(Alyosofi, 2011)

- There is evidence of emotional and behavioural changes affecting some Kuwaiti people; *Al-Husaini (2004)* investigated the factors that may have contributed to violence in school affecting students. The Iraqi invasion had a negative psychological and emotional impact on students' behaviour.

The Contemporary socio-cultural and economic development

The contemporary socio-cultural development in Kuwait was influenced by a sudden economic evolution as discussed earlier, which transformed the social life from traditional styles to a more modern ethos. These transformations created significant changes in the social, cultural and economic life in Kuwait *(Mahmeed, 2007)*. Kuwaiti people and government became more aware of the importance of a strong society after the Iraqi invasion *(Crystal, 2016)*.

The contemporary development maximised the economic resources after Kuwait independence; petroleum, seafood and natural gas makes about 90% of revenue. In 2015, the Kuwait economy suffered because of decreasing oil prices leading to large budget deficits that forced the government to take action to reduce the spending on subsidies, so changing their spending patterns for the future in order to secure a strong economy *(Factbook, 2016)*, including finding alternative sources of income instead of oil production, by enhance the human resource development, such as education and tourism. Technological development needed to be fully engaged in the whole aspect of education *(Ministy of Education, 2011;*

DPREM, 2011). Enhancing investment in Kuwait, and attracting foreign traders and improving the private economic sectors, was obvious in contemporary economic and architectural development in Kuwait *(Central Statistical Bureau, 2013)*

The contemporary architectural development

The development of architectural design in Kuwait followed the changes after the formation of the state during the 20th century. The local and global economic growth in trade and the discovery of oil created an economic boom in Kuwait. The contemporary vision leads to transforming the traditional built environment to formalise an organic form, which introduced many changes on the vernacular design styles as shown in Figure 51. Therefore, many architectural plans applied poor features like the house design shown in Figure 52, which was not appropriate to the Kuwaiti cultural background *(Mahmeed, 2007).*
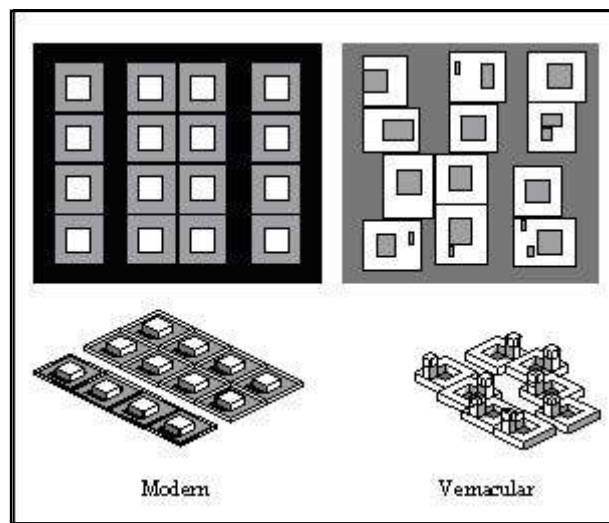
Figure 51. The difference between the traditional style (vernacular) and the modern style *(Mahmeed, 2007)*

Figure 52. The house styles based on modern design *(Mahmeed, 2007)*

In the early 1970s, the Kuwaiti people became aware of the lack of local architecture, the government and architects began to pay more attention to shaping a new architectural vision, which kept the traditional perspective. Architects in Kuwait after 1980 had an impact on the development of a new architectural identity. They mixed the traditional building styles based on Islamic design principles *(Al-Bahar, 1985)* with modern building approaches, as illustrated in Figure 53 (e.g. courtyards located in the middle of the building, privacy windows and decorated traditional doors, arches and roof parapets *(Al-Duaig, 2004)*).

Figure 53. House styles created by Kuwaiti architects which mix modern and traditional designs *(Mahmeed, 2007)*.

Before 1990, Kuwait began to characterised by the revival modern traditional architecture instead of the global modernism architecture that was not linked with Kuwait cultural identity *(Asfour, 2004)*. However, the Iraqi invasion damaged architectural landmarks in Kuwait. *Mahgoub 2008* stated that *"During the war, architecture in Kuwait was targeted for destruction as a representative of an opposed ideology and culture. The attack on architecture was an attack on cultural and ways of living"* (Mahgoub, 2008, p.244). Architectural plans after the war focused on reconstructing damaged buildings as soon as possible, restoring life in Kuwait, both of which arrested the revolution of architectural quality in Kuwait *(Al-Bahar, 1991)*.

The modern trends in Kuwaiti architecture involve the use of new construction materials in design; metal cladding is used in a variety of ways including car shades or as decorative panels (see Figure 54). The warm climate conditions in Kuwait mean that outdoor shady spaces are important; tensile structures have been commonly used in variety of shopping malls, schools, and even residential houses. These tensile structures have been inspired by the history of sailing in Kuwait; they are a representation of the sails of boats used during the 19th and 20th centuries as shown in Figure 55.

Figure 54. Metal Cladding material been used in the new shopping mall in Kuwait for decorative and cover the walls and ceiling *(MERO-TSK, 2007)*

Figure 55. The scientific centre of Kuwait built in 1999 that shows the tensile structures in beach side (Birdair, n.a)

The formation of the official educational system

In 1965, the Kuwait government issued a compulsory educational law which organised and structured the educational system, within two sectors *(M.O.E, 2008)*. The first sector is the formal education, which is divided for two parts and supervised and operated under the Ministry of Education, and the Ministry of Higher Education. The second sector is non-formal education, which is supervised by different institutions; they provide training certificates and courses. The first sector is related to this research and demonstrated below:

A) The Ministry of Education is responsible for the main education stages, which consists of the following:

1. Public education that provides a free education for all citizens from kindergarten to high school (4 to 17 years old).

2. Qualitative education that provides an Islamic religion education and language. Additionally, the education of special needs and disabled students.

3. Private education which is the independent schools that have particular systems that follow the same stages and objectives of the public education like British and American schools.

B) Ministry of Higher Education provided within the two major institutions: The Kuwait University and the Public Authority for Applied Education and Training.

Kuwait's public education system is currently educating approximately 600,000 students enrolled in around 700 different schools. The educational authority reported in their national report that the state of Kuwait gives significant attention to the planning of the strategic policies in order to develop a modern educational system *(Ministry of Education, 2016)*.

The public education system in Kuwait

The public education in Kuwait is provided free of charge for all students from kindergarten, primary, intermediate till secondary or high school. The educational stages are shown in Table 10 *(Central Statistical Bureau, 2013)*.

Table 10. The public school stages (ladder) in Kuwait

Age	Stage	Duration
4-5 years	Kindergarten- Nursery	2 years
6-10 years	Primary School	5 years
11-14 years	Intermediate School	4 years
15-17 years	Secondary School (High School)	3 years

The organisational structure of the Ministry of Education shown in Table 11 indicates the departments that cooperate for the education circumstances in Kuwait. The department dealing with the learning environment and school buildings "The Educational establishment" sector (Highlighted in Table 11). This department divided to three sections:

1. The department of design and establishment.
2. The department of maintenance.
3. Office of technical follow up.

Table 11. The Ministry of Education structure (Department of Public Relations and Educational Media
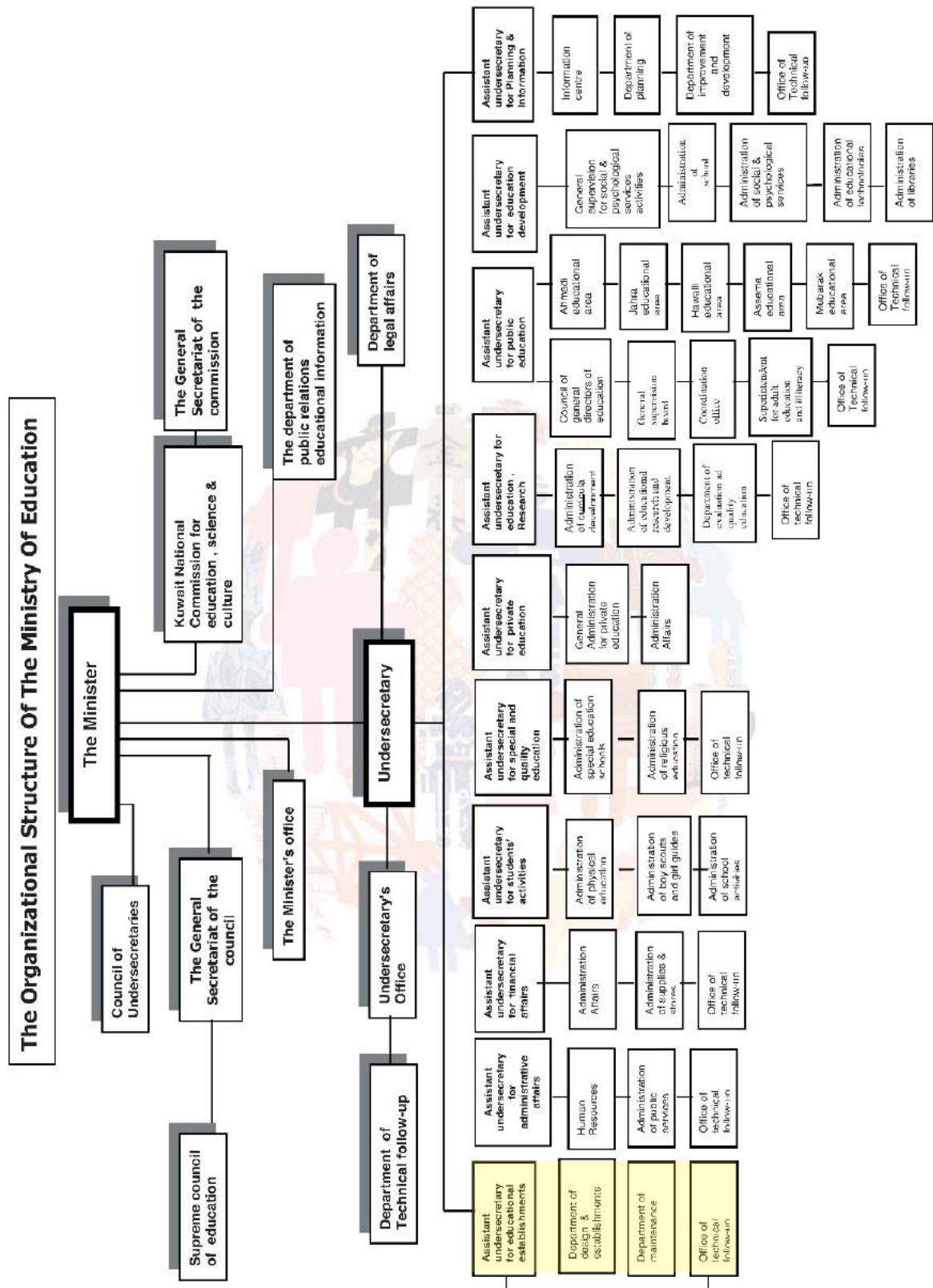
The educational policy in Kuwait

The educational policy is based on a strategic vision that aims to improve the educational quality to achieve the fundamental objectives; the strategic message for public education in Kuwait states that:

'To provide an opportunity for students to maximum their abilities and achieve comprehensive and integrated spiritual, mental, social, psychological and physical growth; to enable them to achieve self-fulfilment and to participate in realising the programs of Kuwaiti society in particular and those of the Arab and Islamic world, as well as humanity in general (DPREM, 2011, p.59).

The general principle for education in Kuwait is to develop students spiritually, morally, and physically to all citizens, with considerations about cultural identity and religious background. The policy makers are accountable for running the education system, providing the budget, employing teachers, building learning facilities, and providing teaching and educational aids, etc. The Kuwaiti constitution mentions that education in Kuwait is a legal right for everyone, delivered free of charge by the government. The government is responsible for providing education from early stages through to diploma or first degree. The objectives to be achieved are *(DPREM, 2011)*:

1. Develop the students thinking and skills within the educational stages.
2. Engage students within the global revolution in knowledge.
3. Improve and develop the educational institutions and its facilities using global standards in order to motivate the students to be more creative and effective in the society.
4. Deliver equal educational and learning opportunities across Kuwaiti schools.

This research is based on the intermediate stage (11-14 years); the objectives of this stage are briefly illustrated in the following section. However, these objectives have connection with the literature review (see Table 2 in chapter Three), which has an influence on the school building design. These objectives are separated into five factors of development which the educational system has to attain, as follows:

- **Spiritual development**: Identifying the Islamic understanding of the creation of the universe which relates to *"the values, beliefs, and practices that represent a given ethno-cultural group"* (Wilmshurst, 2005 ,p.241).

- **Intellectual development**: The way knowledge has an impact on student's scientific thinking. Enhancing the students' logical and intellectual abilities are crucial in education. *Moyles et al. (2003)* emphasised that it is not only the quality of curricula that is vital, but also the teaching styles that motivate the students' attention and performance.

- **Psychological development:** Educating students is important in their acquisition of skills and expertise and for their self-esteem their awareness of their national identity. *Trancik and Evans (1995)* mentioned that physical environments have serious impact on the psychological interactions of the students which need critical attention.

- **Social development:** Students recognise their cultural, tradition and religious background to build effective social imaginations. That involves them in the society to develop their social awareness and concepts of co-operation responsibilities. The literature mentioned that the positive influence of the social issue on health, activity, behaviour and productivity of students and teachers are crucial for providing positive learning environments for educational quality *(Lee and Cho, 2013; McNeill et al. , 2006).*

- **Physical development:** The students understanding about the importance of health, regular exercise and sport activities.

Pedagogy

The pedagogy system for the intermediate stages can be separated to the variety of topics. Most of them are compulsory subjects that required to pass the exams and tests to be completed; while other subjects have no exams or tests. Table 12 shows the subjects for the intermediate stages in Kuwait and the location of the lesson undertaken in the school. It is crucial to understand the role and functions of the classroom environment where the students spend most of their time in school. To illustrate, column 1 in Table 12 indicates where the students attend each lesson regularly. Column 2 identifies spaces that are not often used as teaching areas for each lesson. Most of the compulsory subjects are taught inside the classroom, while the non-compulsory subjects are delivered outside the classroom. Therefore, students in Kuwaiti public schools spend most of their time in the classroom environment.

Table 12. The subjects in the intermediate school of Kuwait and the location of the lesson undertaken

Subject	Compulsory	hours p/w	Location of the lesson	
			1	2
Islamic religion and Quran	Yes	3	Classroom	School mosque
Arabic language	Yes	6	Classroom	Linguistics lab
English Language	Yes	6	Classroom	
Mathematics	Yes	5	Classroom	
Sciences	Yes	4	Classroom	Science lab for experiments and practical exams and tests.
Social Studies	Yes	2	Classroom	Cinema rooms
Computer science	Yes	2	Computer Lab	
Physical Education (PE)	No	2	Playgrounds	
Art Education	No	1	Art Workshops	
Practical studies: 1. Decoration and carpentry	No	2	Carpentry Workshop	
2. Electronics	No	2	Electronics workshops	
Music Education	No	1	Music classroom	
Life style		1		
Home economics (Girls only)	No	1	Home economics workshop	

5.3 Existing school building design and architecture in Kuwaiti public schools

From the outset of the Kuwait official education in 1965, educational buildings were managed by the Ministry of Education. The demand for new schools increased, which influenced with the architectural arrangements towards the end of 20th century. The architects were commissioned by the educational authorities to create architectural prototypes that suited the requirements; and then built them throughout the country. For the purpose of the present research, this section illustrates in details the development of the architectural school building design since 1975.

The details of the interior and architectural elements for the school buildings are crucial, but, the architectural and design development in Kuwait is not well documented; many archives were damaged in the Iraqi invasion. Most of the required data in this research were gathered through the cases studies and interview, which might enrich the literature about the school building design in Kuwait.

The following sections overview the circumstances of the selected schools in this research. These schools were built between1975 and 2011. Although the older schools have been refurbished in the last few years, the original structure and building layouts remain.

Ebn Al-Tofail School

This school was built in 1975, and is located in the Al-Waha town of Kuwait. The school is 12250 m² , and has 21 classrooms for 480 students. The school plan was based on the traditional style where a courtyard was surrounded by classrooms. The open spaces, sport areas and cafeteria are located in the right side of the school as shown in Figure 56. The learning environment is divided into three main sections, as shown and described below:
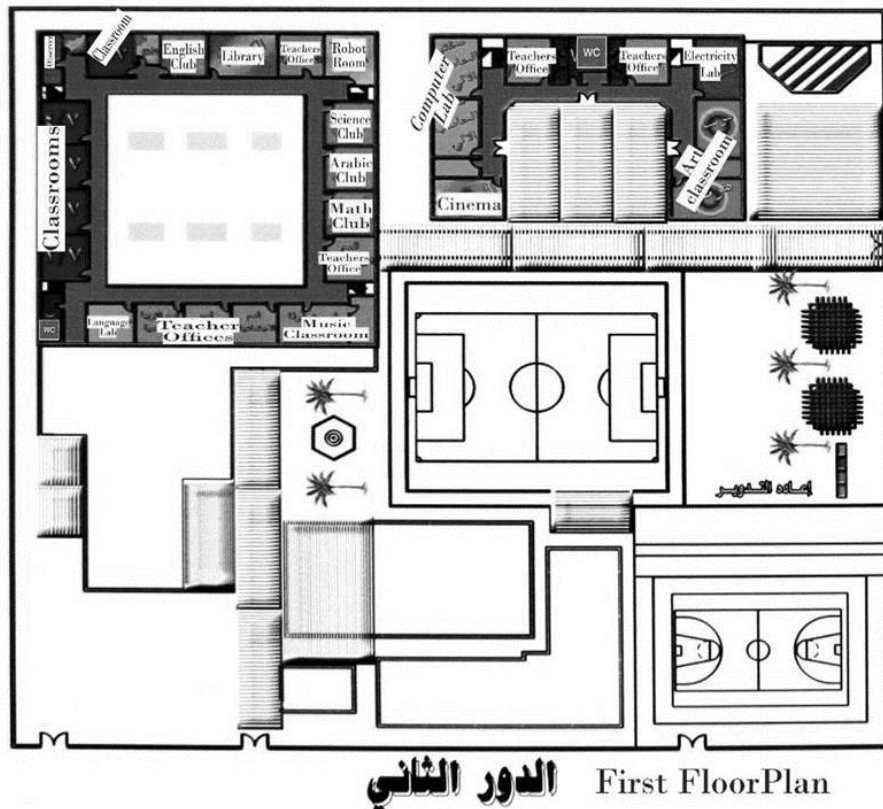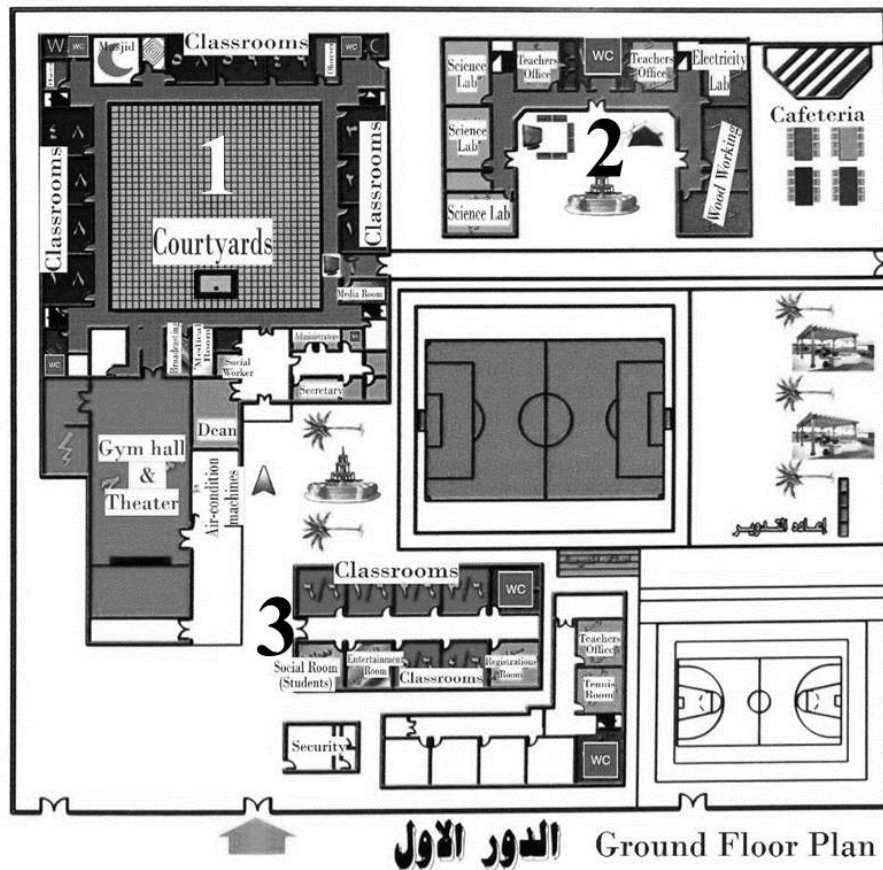
Figure 56. Ebn Al-Tofail intermediate school plan

Section 1: This is the main section of the school; there is a courtyard in the middle and the classrooms surround it in two-storeys. Some areas were added later. This section was influenced by traditional architecture, as the courtyard forms the centre of the old building and corridors lead to the classroom as shown in Figure 57. This style is similar to Al-Mubarakiya school floor plan (see Figure 45).

Section 2: This section has the laboratories and workshops built in second-storey opposite a second courtyard and the football pitch. This section was built in 2004.

Section 3: A single storey with classrooms and social rooms for students; this is a smallest section in this school built to extent the classroom capacity in 2006. No courtyards were included, and the corridors were enclosed.

Figure 57. Main Courtyards of the Ebn Al-Tofail School

The Ebn Al-Tofail school design has variety of open spaces influenced by cultural and traditional elements like Bedouin tents, wooden and palm leaf roofed shelters. Most of the school walls including the courtyards, were painted with traditional murals that reflect the old styles within Kuwaiti buildings (see Figure 58). The cafeteria is located in the corner of the

school with sheltered seating and tables that connect to the football pitch and social tents as shown in Figure 59. These spaces encourage students to socialise during free time between their classes.

Figure 58. The social spaces which shown the Bedouin tent in the second courtyard

Figure 59. The sheltered spaces and the cafeteria

The classrooms within Ebn Al-Tofail School are rectangular as illustrated in Figure 60, between 44 to 54 square metres in size. The walls and ceilings are constructed of cement, and plasterboard. The spatial design was based on the teaching style environment of the classroom; the teacher is centred in the classroom with rows or a cooperative seating arrangements for students facing the teacher.

Figure 60. The classrooms in the Ebn Altofail School

- **Abdulatef Al-Shamlan School**

This school, built in 1984, is located in Al-Jahra town; it is 19480 m² in size and provides 15 classrooms for 335 students. The design of this school, as shown in Figure 61, is also influenced by traditional design features which include courtyards at the centre the building. This design is similar to the first school mentioned above.
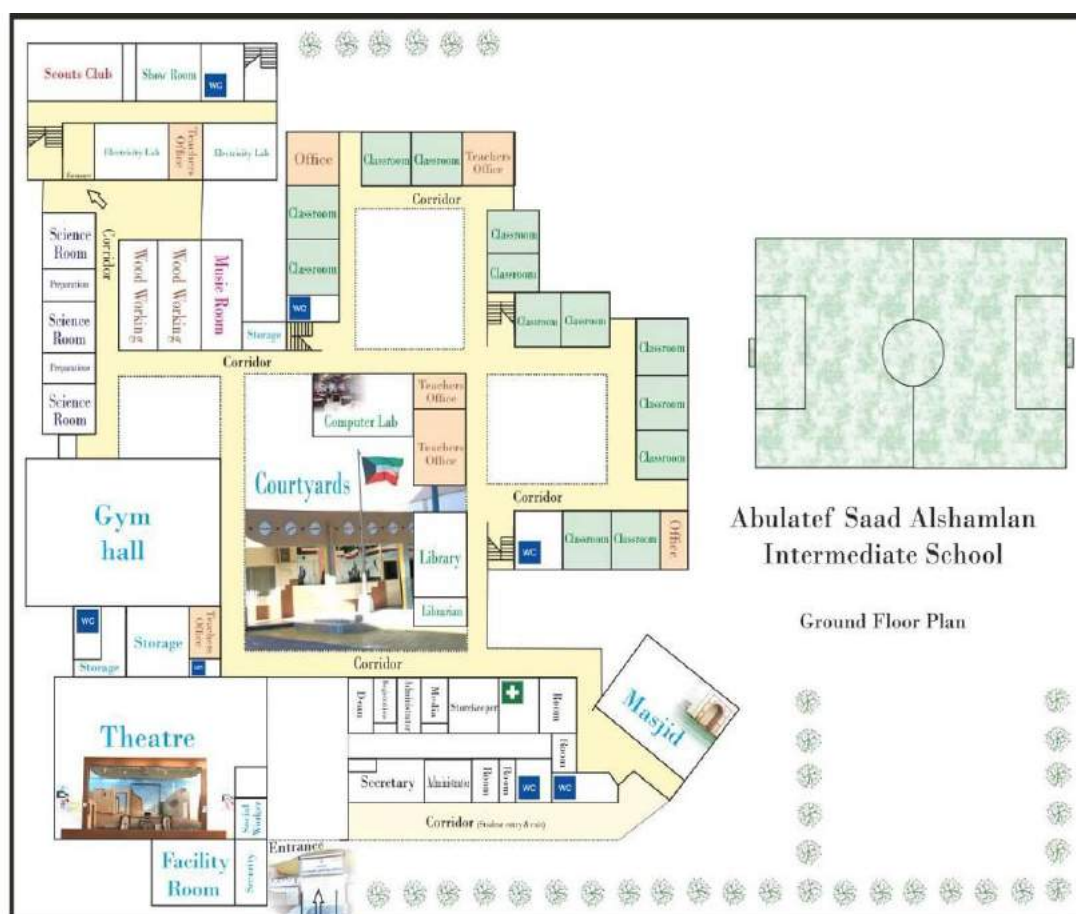
Figure 61. Abdulatef Al-Shamlan school plan

The school is shaped as in rectilinear segments surrounding the main courtyard (see Figure 61). This main courtyard is located in the centre of the school, which has easily access to other areas of the school as shown in Figure 62. There are also two small courtyards at the centre of the classrooms with a two-storey building on the right side of the main courtyard (see Figure 63), whereas the Ebn Al-Tofail school had the main courtyard located in a corner of the school. The corridors are highlighted in yellow in Figure 61, linking the school together, originating from the main courtyard to other sections of the school.

Figure 62. The main Courtyard of the Abdulatef Al-Shamlan School

Figure 63. The two small linking courtyards in the Al-Shamlan School

The layout of the classroom is rectangular shape, and is 50 square metres in size. The spatial organisation follows the traditional teaching arrangement, where students face the teacher position. The seating arrangement was arranged in single rows (see Figure 64).

Figure 64. The classrooms in the Al-Shamlan School

- **Al-Wohaib School:**

This school, built in 1986, is located in the Al-Jaberiya town close to Kuwait city. The size of school is 19220 m². There are 666 students within 28 classrooms. The design has three sections described below and shown in Figure 65:

Section 1 has the original school structure that includes classrooms and other facilities. This section is the biggest part of the school, and is influenced by the traditional courtyard style.

Section 2 was built later to increase the classroom number on two-storeys. This is an enclosed building with no courtyards.

Section 3: The social and sport spaces are located at the side of the school, and can be reached from the main building (section 1). These spaces are for sport and social activities, and include a Mosque (Masjid) for students to practise their faith.
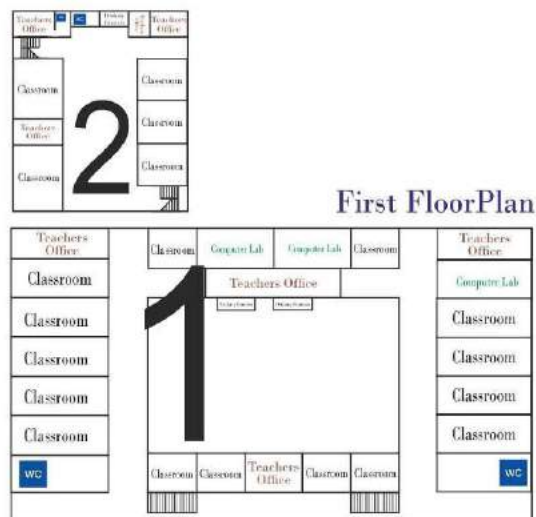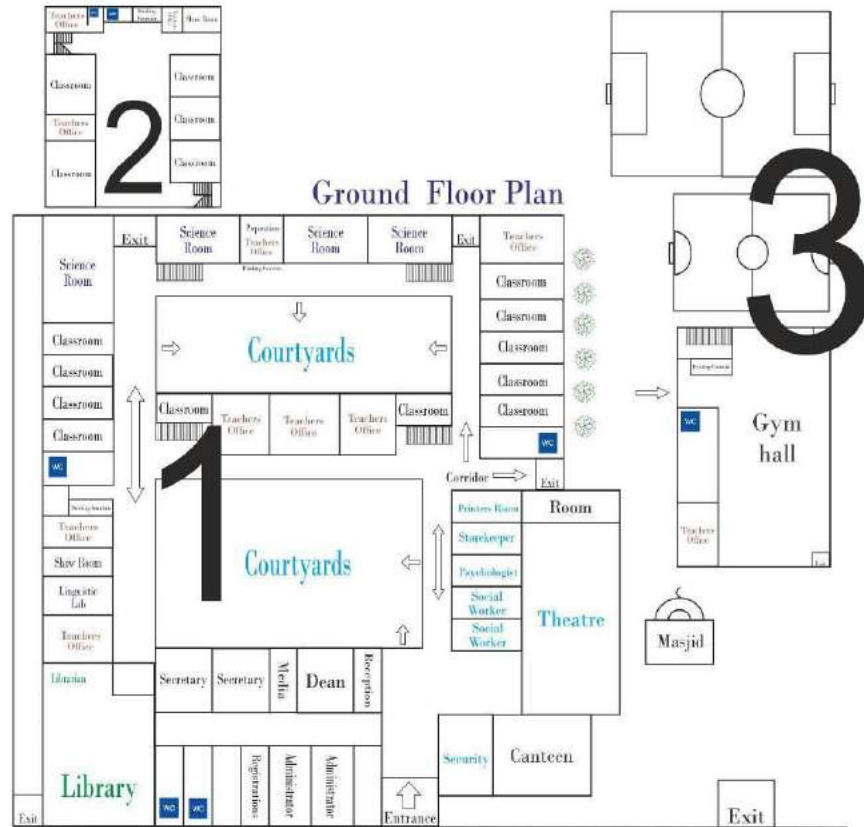
Figure 65. Al-Wohaib school plan.

Two courtyards are provided; the first is bigger and the corridors around it are not totally roofed, as shown in Figure 66. Whereas the second courtyard has totally covered corridor (see Figure 67). The corridors in the two schools described above were different to this school, in that they are uncovered and overlook the courtyards.

Figure 66. The main courtyard in Al-Wohaib school shows the left side of the corridor was covered and not open to the entire courtyard

Figure 67. The second courtyard in this school was totally enclosed.

The classroom arrangement in this school is similar to the previously described schools, as shown in Figure 68. Students are seated in rows, focusing on the teacher. Although, the sizes of the classrooms vary, the student density in all classrooms was the same. The older classrooms in Section (1) are larger size than the newer ones in Section (2). The sizes vary between 41 - 63 square metres.

Figure 68. The classrooms in the Al-Wohaib School

- **Mohalhal Al-Modaf School**

This school was built in 1987. It is located in the Al-Shaab town within the centre of Kuwait. The size of the school is 34000 m², the largest school in the present research. There are 500 students and 18 classrooms. The design of this school has changed from simple square forms into a linear plan or double U-shape, as shown in Figure 69. The school is divided into two main sections:
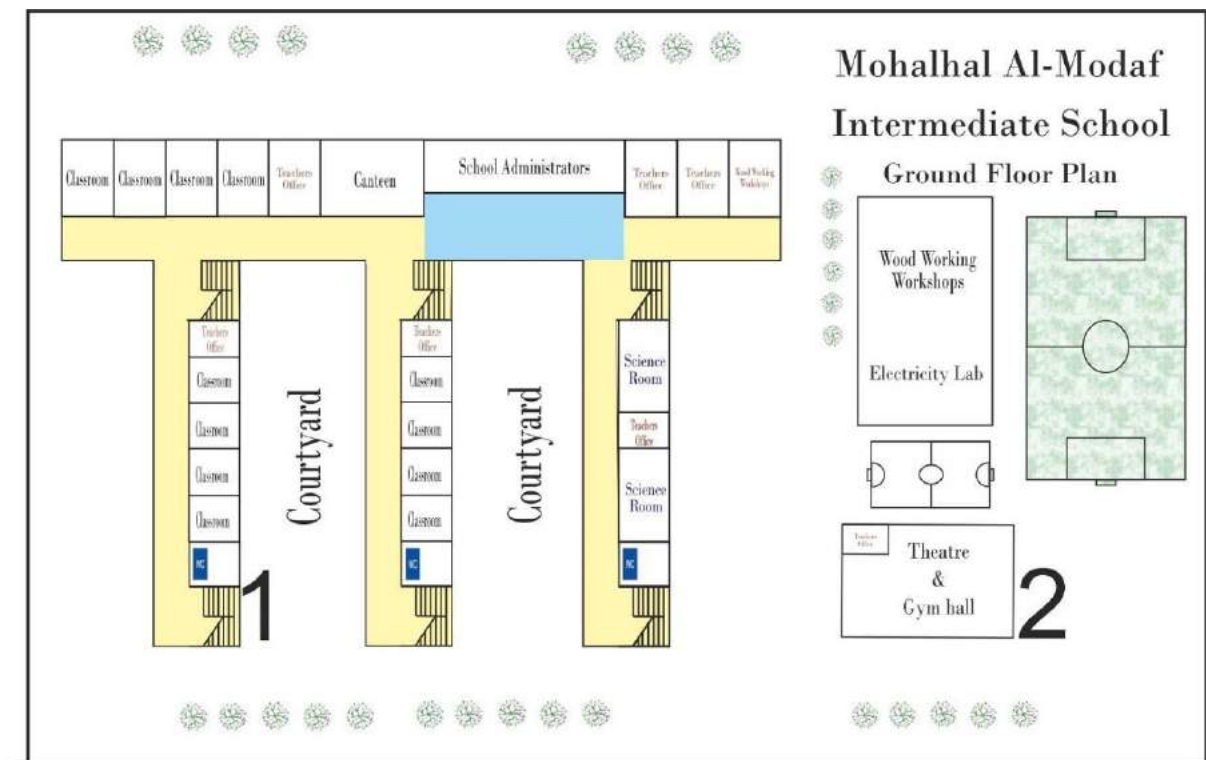
Figure 69. Mohalhal Al-Modaf school plan

Section 1 is the main school unit and has three-storeys surrounded to the courtyards; which is uncommon in Kuwaiti school designs (see Figure 70). The third floor classrooms and spaces were not used effectively during the investigation. The corridors play a critical role in the school as they link the school sections together, as well as linking to the second section. Two courtyards are located in the main section, but are not at centre of the school. The main space that used more effectively was highlighted in blue in the school plan (see Figures 69 and 71).

Section 2 has two buildings and sport pitches as shown in the school plan. There are a variety of social spaces available in this section especially in the theatre and gym (see Figure 72).

Figure 70. One of the courtyards was not completely covered;and the three floors and corridor are visible

Figure 71. The centre space of the school leads to both courtyards as well as to the second section

Figure 72. The second section in Al-Modaf school

The classrooms are allocated to each subject department, for example, classes solely purposed for learning the Arabic language department has allocated classrooms in the school, and the students who have an Arabic class walk to one of these classrooms. It is noticeable that some of the classrooms display information directly relating to the subject area.

The spatial organisation of the classrooms is similar to the previously described schools; the seating is arranged in rows and is shown in Figure 73. The classrooms are rectangular, focusing on the teacher, and are between 70 to 80 square metres.

Figure 73. A-Modaf school classroom

- **Qaiss Ben Abi Alaas School:**

This school was built in 2006 at Hateen town, the school is 12600 m², there are 380 students using 16 classrooms. The design is listed as the newest school design that built in all the new cities in Kuwait, which influenced by western architecture, it is called the 'wing shape prototype'. The older traditional school shape was transformed from a simple square to a semi-circular octagon as shown in Figure 74.
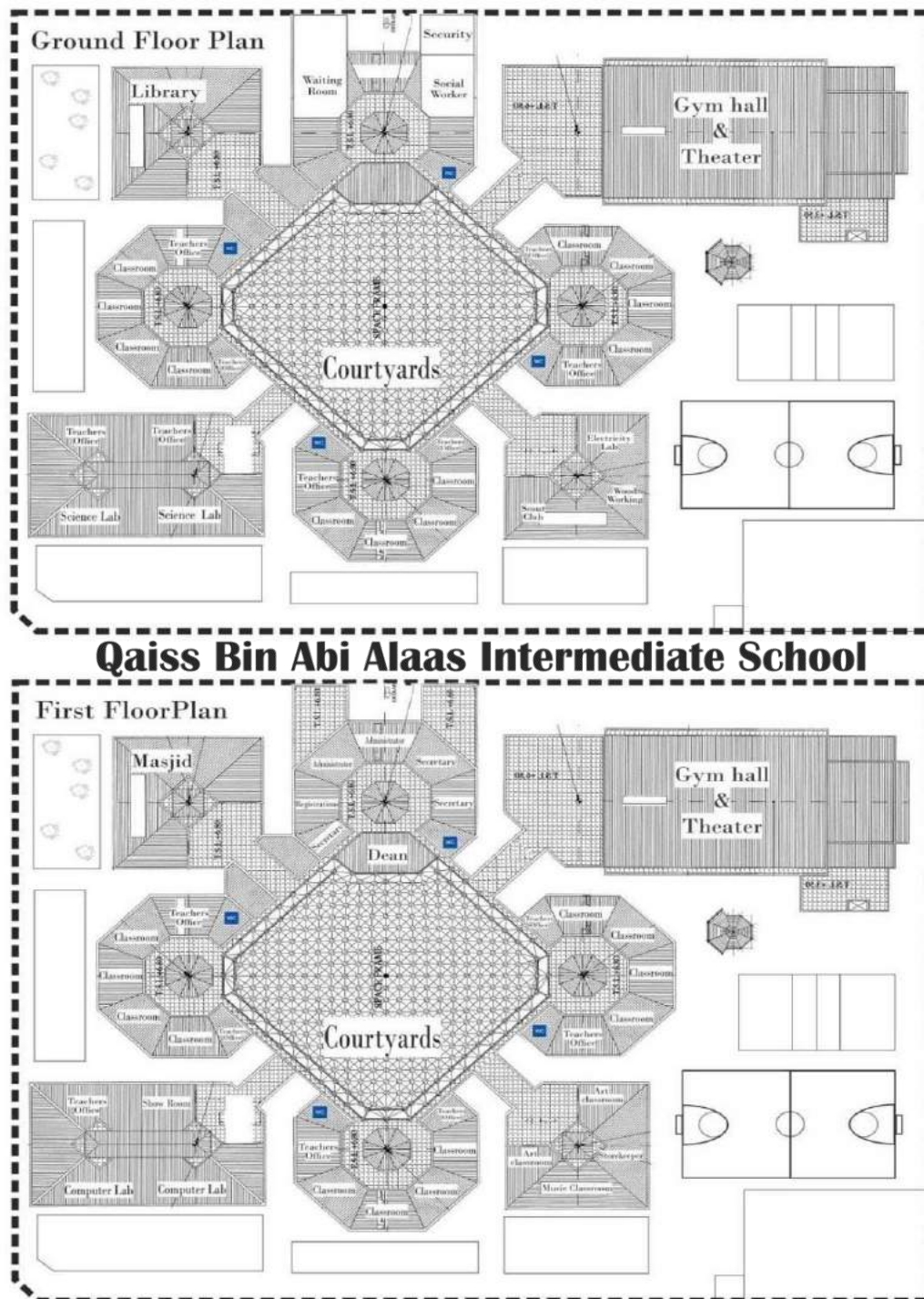
Figure 74. Qaiss bin Abi Al-Aass school plan

There are four octagonal sections in this school consisting of two-storeys, three of them are used as classrooms while the fourth is the school entrance and administrators' office. The school hall and other facilities are rectangular and square-shaped buildings located in the corners of the school. This school design brings all sections together, linking to the main courtyard in the centre of the school, with the classrooms and other facilities located in the wings off that courtyard. The sport pitches and social areas can be reached through the main building. In previously described schools there was more than one courtyard; this school has only one courtyard which plays a key role in the school, as shown in Figure 75.

Figure 75. Qaiss bin Abi Al-Aass school main courtyard

The corridors in this school surround the courtyard allowing students to move freely around their learning space. The corridors are partly enclosed and air-conditioned inside the four wings, while outside the wings overlook the courtyard, as shown in Figures 75 and 76.

Figure 76. The inside corridors of the octagonal section

The classroom layout is semi Hexagon in shape (trapezoidal in layout as shown in Figure 77). The back of the classroom is wider than the front. It is influenced by the teaching system that directs the student's attention to the teacher's position at the centre front of the classroom. The classroom sizes are around 52 square meters, similar to the previously described schools. The seating arrangement as shown in Figure 78 reflects the room shape in rows, although some classrooms have a seating plan was arranged as a U-shape.
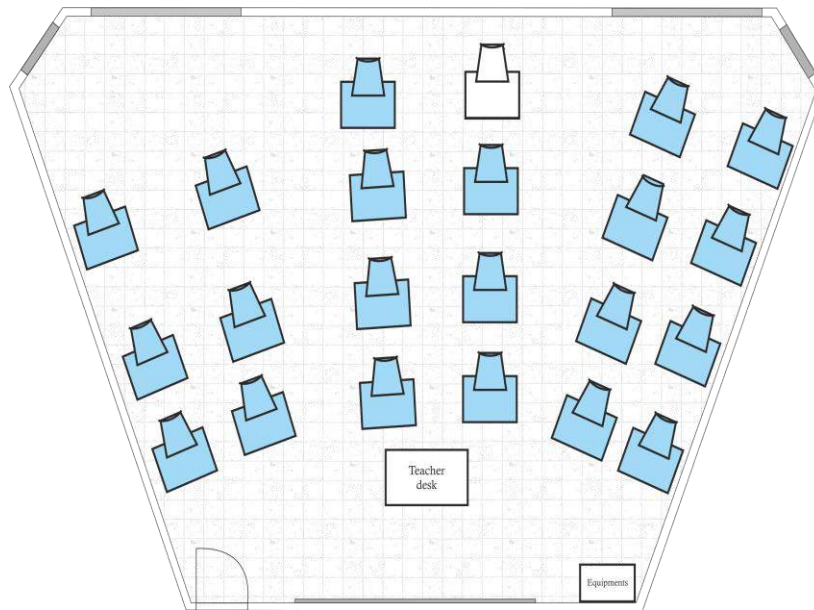
Figure 77. Hexagon shape classroom layout

Figure 78. Qaiss bin Abi Al-Aass school classroom

- **Ahmad Al-Saqaf School:**

This school was built in 2011 in the Jaber Al-Ahmad town, a newly built area. The school design is the same as Qaiss Bin Abi Al-Aaas. Although the school plan and structure is the same, the size and layout slightly are different as shown in Figure 79. The total size of the school is 16837 m²; there are 410 students using 18 classrooms.
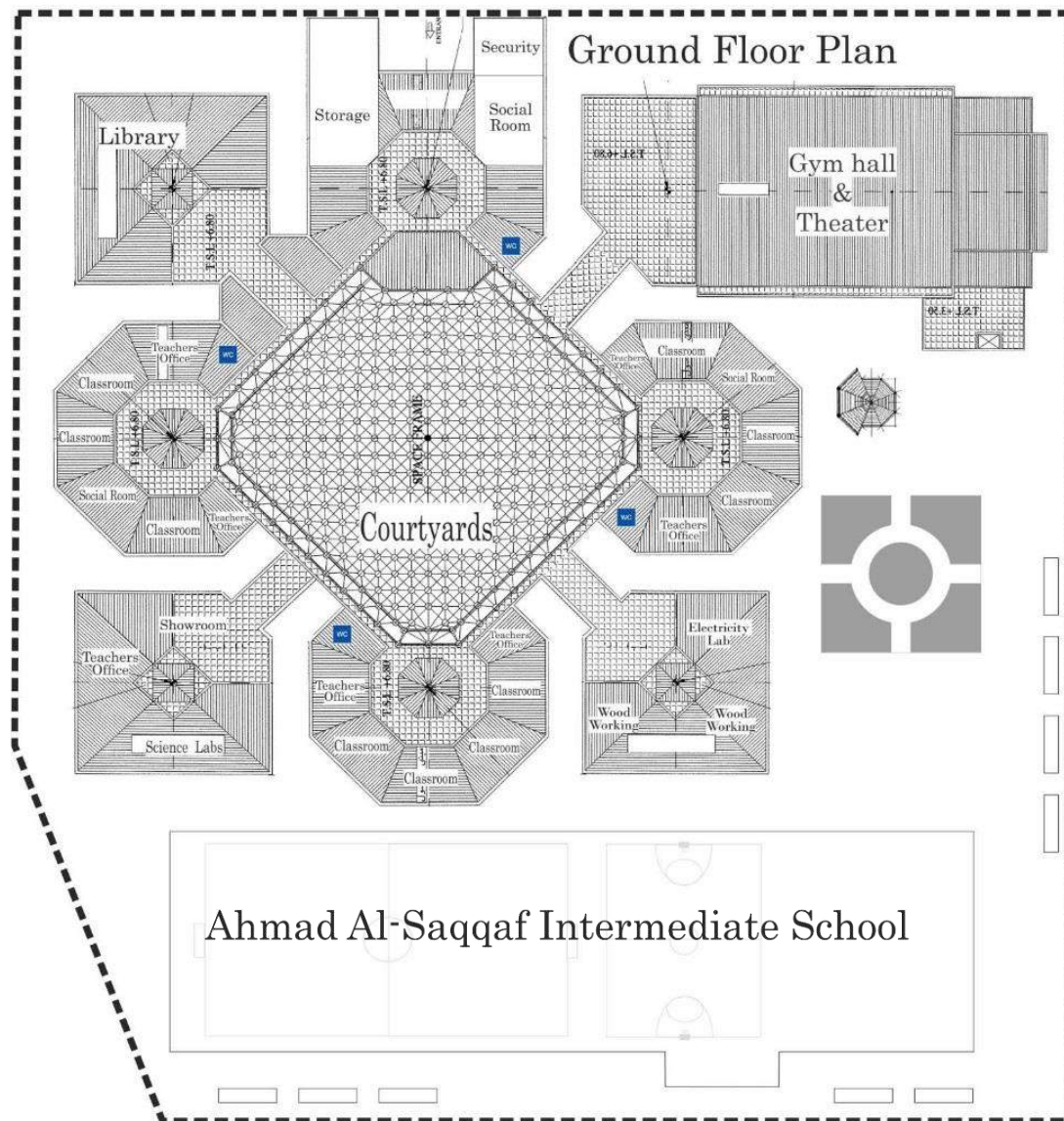
Figure 79. Ahmad Al-Saqaf school plan

The backyard of the school has a canteen and open social 'green' areas as shown in Figure 80, and the sport pitches are bigger than in the previously described school. Additionally, in the main courtyard, there are a table tennis areas and basketball hoops which encourage students to play sport in their free time as shown in Figure 81.

Figure 80. The backyard of the school: a social space for students

Figure 81. The main courtyard where sport is played in free time

The corridors in this school are open and not covered or enclosed between the classroom wings; the classroom sections were integrated with the main courtyard as shown in Figures 81 and 82.

Figure 82. The octagonal classroom wing that shows how it is integrated with the main courtyard

The classroom layout is organised similarly to the previous school, the seating arrangements are in rows directed to the front as seen in Figure 83.

Figure 83. The classroom in the Ahmad Al-Saqaf School

Summary of chapter five

This chapter discusses the growth of the educational system in Kuwait and especially the development of the physical learning environment. The review shows that the development of the education system in Kuwait is based on the pedagogy system and curriculum. The three periods of Kuwaiti history show that the school environment is typically designed for teaching in a didactic style.

The social and cultural perspectives of Kuwaiti people influences today's learning environment: the courtyard is central in the school. The development of the learning environment especially in the modern period moved the design from simple square, traditional, structures to more complex ones that have a variety of geometric shapes and perspectives, but the educational system and teaching styles have not changed.

These considerations need to be investigated more thoroughly with the students, teachers and school administrators to collect their feedback and concerns regarding the learning environment. The following chapter demonstrates the research methodologies findings.

Chapter Six

Case studies and interview

The design of the research

Stage	Process
Background study:	Identifying the gap in the existing knowledge to validate the research proposal
Aim and objectives:	To develop a better understanding of the interrelation of physical environment and learning performance
	Identification of important physical elements/factors which have important bearing on learning environment
	Exploring socio-spatial organisation of learning environment · Examining feature that characterises the learning environment · Assessing the mechanism of integration of all socio-physical factors in learning environment
	Conduct a Pilot Studies in random schools in Kuwait to obtain an initial data and check the methods
Literature review:	Promoting the approach of the study and developing a conceptual framework for the research
	Research concept · Research questions · Research strategy
Empirical work:	Establishing criteria for the case study
	Tracing the physical and environmental characteristics of selected schools · Examine the students' performance and motivation in each school
	Comparative analysis of the collected data from the case study
Conclusion:	Responding to the research questions by summarising the findings and suggesting the research implications for practice and research

6   Case studies and interview

6.1   Introduction

The previous chapter discussed the historical development of the state of Kuwait, with particular attention to the architectural identity, and the learning environment within three periods. The present chapter discusses the case studies outcomes about the environmental aspects of the selected schools, towards evaluating the influence of teaching and learning environments on students, teacher's performance. The process of the case studies includes the following stages:

- First, a pilot case study conducted to check the validity of the research questions.
- Second, the case studies. This encompassed a physical survey, observation and questionnaire. A comparative analysis of the main case study was used to extract the results for the research outcomes.
- Third, a semi-structured interview with officials from the educational authority in Kuwait. To compare their views with the outcomes of the main case study.

6.2   Pilot study:

The outcomes of the literature review indicated the learning environment plays a fundamental role in students' learning's. The planning of the case studies included a pilot scheme to ensure the selections of schools, survey methods and vocabulary used for questionnaires and interviews were correct, and comprehensible by the respondents. The pilot study was conducted in three public intermediate schools in Kuwait chosen randomly.

The first Intermediate School was built in 1975; it is located in a residential town called Al-Rodha, close to the centre of Kuwait (see Figure 84). The school site is 31500 m² in area, whereas the building size is 19500 m², and includes 26 classrooms for 584 students, and other facilities include a theatre, laboratories and workshops. Each classroom is suitable for 20-25 students. This school is larger than the other two schools involved in pilot study. It serves a larger residential area; some of the school facilities like the theatre, playground and computer classroom are used by the local community.

Figure 84. First Intermediate School site and entrance

The second Intermediate School was built in 1981, and is located in Bayan town within 9 miles from Kuwait city centre (see Figure 85). The school site is 17920 m²; the building is around 7453 m² and includes 32 classrooms for 730 students. Each classroom holds 25 students. The original plan for the school was as a high school till 2001, when the Ministry of Education refurbished it to be an intermediate school.

Figure 85. The second Intermediate School site and entrance

The third Intermediate School was built in 1986, located in Al-Jaberiya city one of the largest residential areas in Kuwait (see Figure 86). This school was described in previous chapter, the site area is around 19920 m²; the building area is 8453 m²; there are 28 classrooms for 660 students. The school building was refurbished in 2012 by the Ministry of Education.

Figure 86. The third Intermediate School site and entrance

Outcome of the pilot study

The aim of the pilot study was to check the validity of the research, and consider its outcomes for conducting the main case study. The outcomes of the pilot study are presented as follow:

- First: The selected schools within the pilot study were built within 10 years of each other. All have comparable features and layouts in terms of the school design, and quality. In addition, these schools were located in large residential areas close to Kuwait City. For the purpose of this research, the school selection for the case studies was based on the school age, site and location.

- Second: The pilot study demonstrated that the younger students in class 6 and 7 (11-12 year old pupils) were more receptive to this research. While class 8 and 9 (13-14 years) students were less engage. The main case study split the students into different age groups, to understand the students' reactions.

- Third: The students' responses were about the basic classroom environment, as they were less knowledgeable about the standard of the learning environment. This research requires in-depth details about the quality of the learning environment. Therefore, involving the teachers, school administrators and the designers was important for the research findings.

- Fourth: The pilot study results showed that the nature of the questions raised were too broad, and did not convey the intent of the investigation clearly to the students. Many students misunderstood some of the questions, indicated by discrepancies in their responses. For example, questions 1 and 2 (see Figure 87) were not comprehended by the students; the student's answers were mismatched in relation to the quality of schools' design. Most of the students agreed the need to improve their school and classroom designs, while in response to Question 2 the majority of student's replies contradicted those to with question 1. Thus, the case studies questions needed to be clarified and rewritten to convey the message for the participants to be suitable and understandable for all age groups.
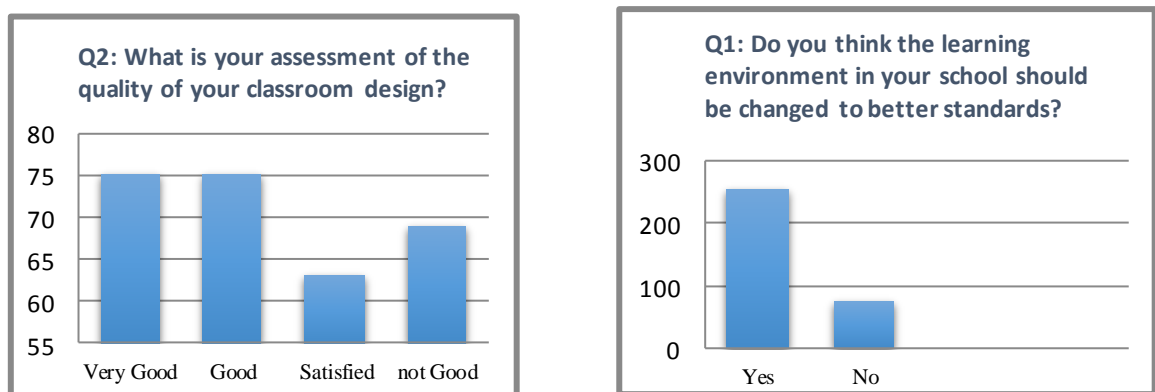
Figure 87. The student's response to questions 1 and 2

- Fifth: As the results shows in Figure 87, in response to 'the quality of school design and classroom', the student's responses were clear in Q1, but was not clear in Q2. That reveals that students at this age group are not able to interpret or explain the situations clearly. Developing direct questions that can be answered with 'Yes' or 'No' responses are more suitable for students in the case study. Consequently, the yes/no questions were used for the students' questionnaire. While the Likert scale (multiple responses) were used for teacher and school administrator questionnaires.

6.3 Main case study
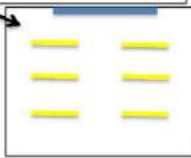
Following the outcomes of the pilot study, the main case studies were undertaken. The case study sought to assess the physical features of the classrooms, and then evaluate the interaction, behaviour and performance of the learning and teaching environment on the students and teachers. The case study was conducted through three methods that based on the pilot study outcomes, which are: the physical survey, observation and questionnaires. The selected schools were enhanced by the pilot study outcomes. Five intermediate public schools for boys were selected, including one school from the pilot study. The other schools were selected according to building age, site and location.

Physical Survey

The survey aimed to evaluate the existing quality of the physical classroom environment in the selected five schools. The physical survey checklist is shown in Appendix B. The assessed factors are shown in Figure 88, such as school size, layout and density which were reviewed. Evaluation of the classroom interior features, including the seating arrangements, lighting distribution, acoustic, thermal control feature, aesthetic and visual qualities was carried out.

Figure 88. An example of the collected physical survey checklist.

The school appraisal model was undertaken to support the assessment of the school building quality as mentioned in chapter four (see Appendix C). The school appraisal procedures were started by the researcher in the early morning to review the educational program, permission letters, school density with the selected school administrators. In addition, the researcher checked the traffic patterns, school safety signs, and the neighbourhood environment before approaching the school site (more details in Appendix C). Therefore, the following sections evaluate the schools that are involved in this study based on the physical survey checklist and building appraisal. The school name were anonymised in this section for the ethical considerations.

School A

This school is the oldest involved in this research; it was built in 1975, and is located in the countryside of Kuwait where most families at this school belong to the Bedouin tribes. The school has 21 classrooms for 480 students (see Figure 89).
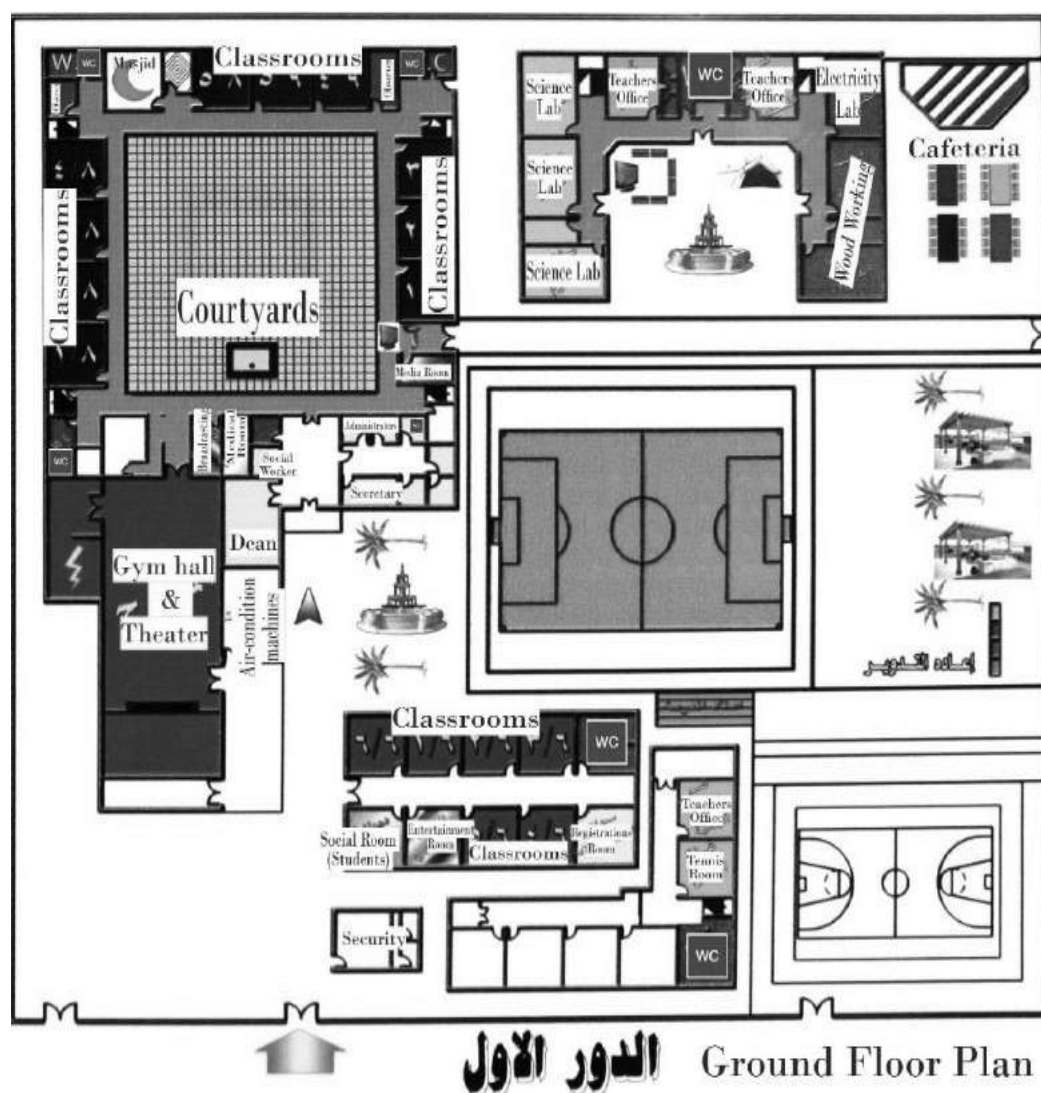
Figure 89. School A plan

The classrooms in this school were of various sizes and mostly rectangular in shape (see Figure 90). Classrooms were around 52 square metre in size; the more-recently built classrooms are about 44 square metres, with approximately 21-25 students per class. Each classroom has 3 to 4 windows and around 160 x 130 cm size. The natural light varies in each classroom, depending on classroom orientation. The classroom decoration style used two contrasting in colours, mostly pink with green, beige with light blue, or beige with red. There are two kinds of seating arrangement, first is in rows and the second, a cooperative

arrangement. The furniture has iron frames and a laminated plywood top in a variety of strong colours like red, green or blue. There are four to six fluorescent lighting units in each classroom, plus the natural lighting coming from the windows. If the window blinds were raised, there was glare reflecting off the wall and whiteboards. The noise level inside the classroom outside class time was between 35 –45 dB, and during schools time reached 86 dB. The classrooms had a book shelves on the back wall, and featured school behavioural rules posters on the walls.

Figure 90. The classrooms in School A

There were only two air conditioning units per classroom, with no heating facilities that could be used in winter. Damage was apparent in some classrooms as shown in Figure 91: parts of the mosaic terrazzo tiles were broken both within and outside the classrooms, and some light bulbs were out of order which reduced lighting levels. An additional hazard was an electric socket insecurely fixed to the wall causing a potential health and safety issue.

Figure 91. Damaged fittings in School A

This school has specific rooms for each subject, such as science, language, or mathematics, as shown in Figure 91 to provide the dedicated facilities, aids and displays relating to the subject. However, these rooms were not intended to be the main classroom used on a daily basis. These featured rooms are highly decorated, creating a sense of overcrowding and distraction for the students. As shown in Figure 92, the rooms design and layout seems to be designed for parties or ceremony purposes rather than provide a learning environment that motivates and engages students effectively.

Figure 92. Centre of science (left), and centre of maths (right)

Table 13 summarises the appraisal rating for each section; details for collecting information are discussed in methodology chapter (Section 4.2.5). The overall rating indicates borderline levels of acceptability. The highest score was for the school site (79%), followed by environment for education section. The school size generally was appropriate, and has a variety of gathering spaces for student's interaction and motivation based on Kuwaiti Bedouin cultural heritage (see Figure 93). However, the lowest score was the school building safety and security such as emergency safety signs not being clear in the building and classrooms. Additionally, the ceiling, floor and walls were not in a good state of repair.

Table 13. School A appraisal summary

Appraisal Summary

Section	Possible Points	Total Earned	Per Cent	Rating Category
1.0 The School Site	100	79	79 %	Satisfactory
2.0 Structural & Mechanical	200	145	72.5 %	Satisfactory
3.0 Plant Maintainability	100	61	61 %	Borderline
4.0 School Building Safety and Security	200	110	55 %	Borderline
5.0 Educational Adequacy	200	144	72 %	Satisfactory
6.0 Environment For Education	200	149	74.5 %	Satisfactory
Total	**1000**	688	68.8 %	Borderline
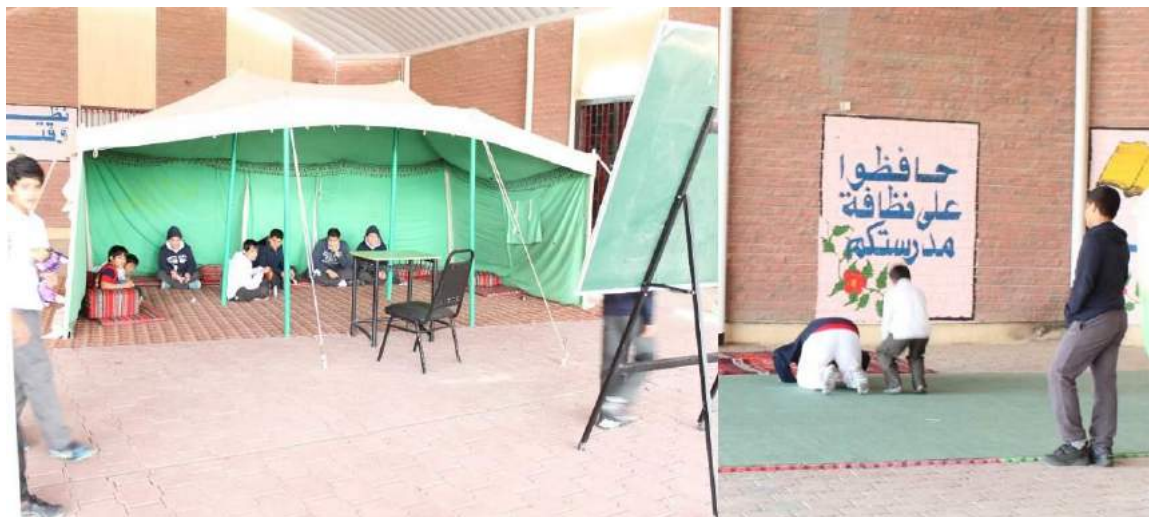
Figure 93. : Students gathering in the Bedouin tent and other students praying in free time

School B

The school was built in 1984 and is located in Al-Jahra town close to School A (see Figure 94). The majority of students are from Bedouin families. The school has 15 classrooms for 335 students; this school was refurbished within the last ten years by the Ministry of Education. The overall quality of the site and construction was outdated and needs redevelopment.
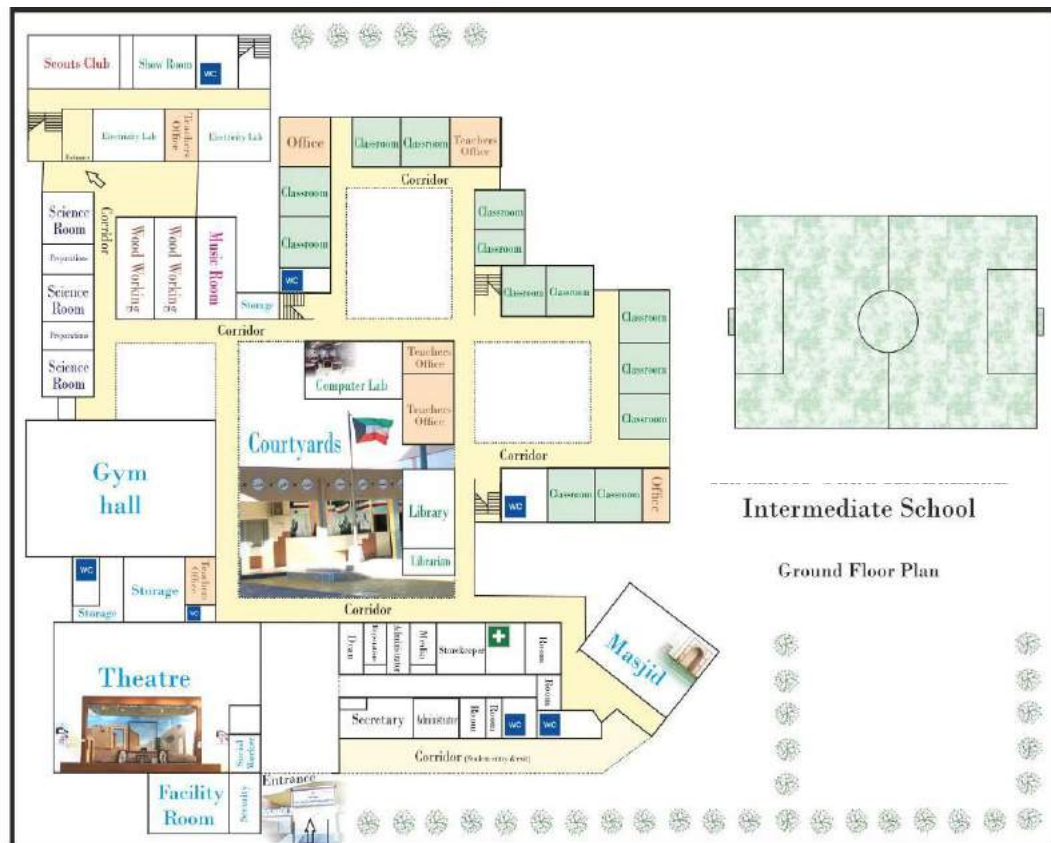
Figure 94. School B plan

All classrooms in this school having the same features and sizes. Each classroom was a rectangular shape with an area of around 51 square metres intended for 23 students. Three windows are located in each classroom; the larger window in the back is rectangular, with two wider windows near the classroom door. The only natural light enters from the back window; the left side of the classroom overlooks the corridors and has no direct natural light. The classroom tiles were mosaic terrazzo, with prefab concrete squares forming in the ceiling (see Figure 95).

Figure 95. School B classroom layout

The colours used in these classrooms were plain and not distracting; the walls being light beige and ceilings white. However, the furniture was same as the school discussed previously, using blue, red, green and yellow and being multi-coloured in each classroom. The seating arrangement was in rows in all classrooms, all facing the whiteboard and teacher area. Six fluorescent lighting units hung in each classroom; glare reflected on the whiteboard and there were no blinds provided to avoid this. The noise level inside the classrooms during off school time were between 42 – 60 dB, one classroom located in the corner of the upper ground floor had 33-45 dB - lower than other classrooms. Other classrooms located in the middle of the school had 66-72 dB, the highest level recorded in this study. Two air conditioning units were provided in each classroom, heating was not available.

The classrooms showed damages as illustrated in Figure 96. Although graffiti is banned in all schools of Kuwait, most classroom walls and furniture had some graffiti. Door handles were broken, lights bulbs were not working, and some of the furniture was broken. There were many uncovered electric wires and broken sockets found inside the classrooms. Lockers were provided outside of each classroom, but most were damaged and could not be used.

Figure 96. Damage in the School B classrooms

The appraisal for this school indicated an overall rating for the school as poor (see Table 14). The 'school site' section and 'educational adequacy' rated as borderline due to the classroom environment not stimulating the social interaction of the students. The quality of the 'structural & Mechanical' section was rated as poor and had the lowest score in the appraisal, as the electrical facilities were poor and hazardous. The overall classroom environment was poor as shown in Figure 96, most classrooms had been affected by water leaks and broken electrical sockets.

Table 14. School B Appraisal summary

Appraisal Summary

Section	Possible Points	Total Earned	Per Cent	Rating Category
1.0 The School Site	100	60	60%	Borderline
2.0 Structural & Mechanical	200	76	38%	Poor
3.0 Plant Maintainability	100	52	52%	Borderline
4.0 School Building Safety and Security	200	85	42.5%	Poor
5.0 Educational Adequacy	200	120	60%	Borderline
6.0 Environment For Education	200	99	49.5 %	Poor
Total	1000	483	48.3 %	Poor

School C

This School was built in 1986 and is located in Al-Jaberiya town one of the largest residential areas in Kuwait. The student's background is of mixed social stratification including merchant family, Bedouin, and other middle class Kuwaiti people. The school comprises 28 classrooms for 666 students; new classrooms were built when the school was refurbished.
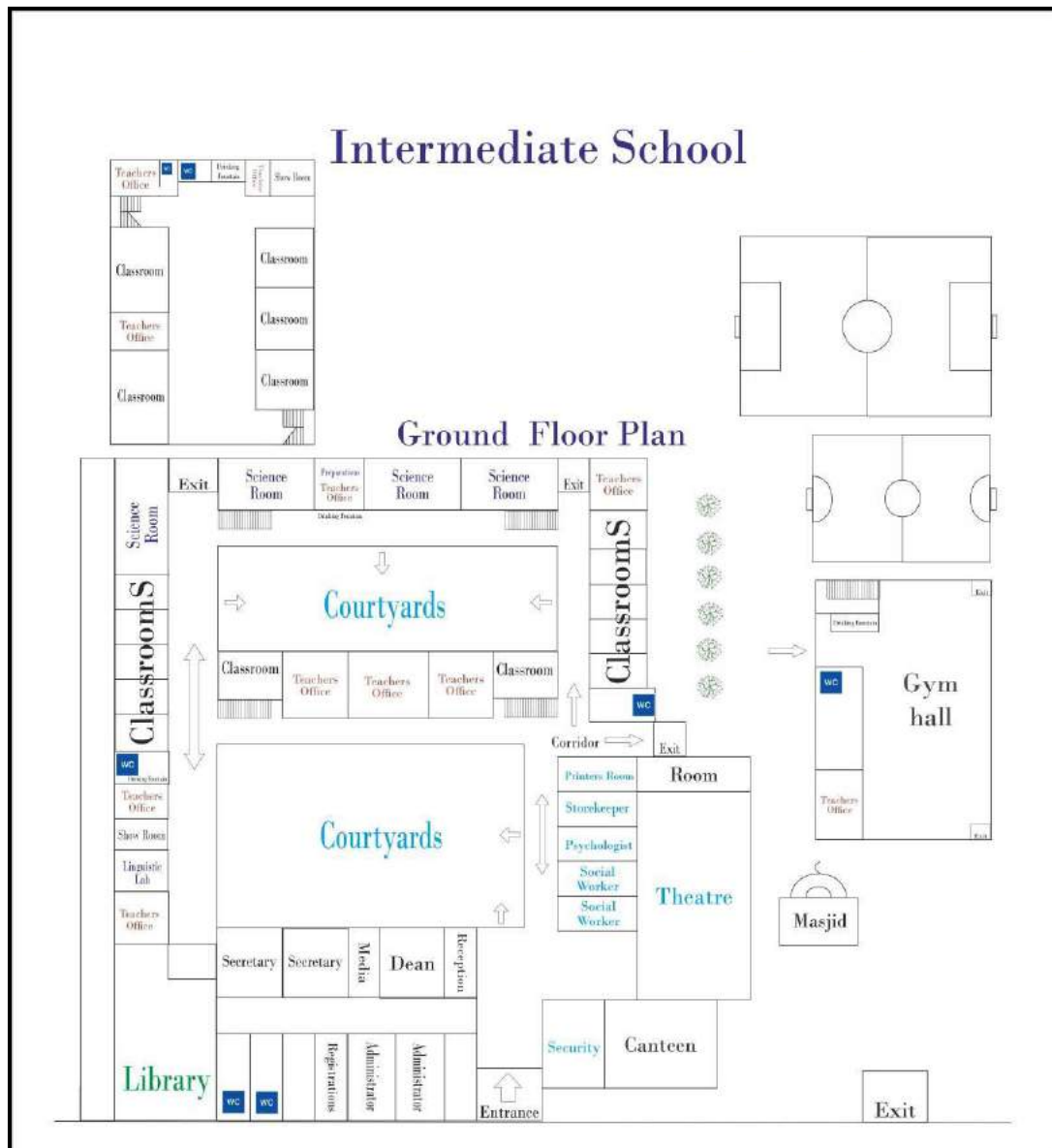
Figure 97. School C plan

The classrooms are mostly square and the new-built classrooms are rectangular (see Figure 97). The smaller classrooms were around 42 to 50 square metres; and the biggest classrooms were 61 square metres. The ceiling height is about 4 metres in the older classrooms, higher than the newer classrooms and also higher than other schools studied in this research, which have not changed the function of the classroom. There are between 22 and 26 students per classroom, higher than in the other schools investigated. Daylight levels were poor, since the window glass was tinted to reduce the natural light. The new classrooms only had three windows and were smaller in size than in the old classroom which had four windows.

Figure 98. The classrooms in School C

The seating arrangements were in rows and used the same furniture as described above in other schools, with seating facing the front of the classroom. The colour used in these classrooms was blue or beige, as shown in Figure 98; a divided painted wall style is used in the classrooms. The ceiling was white and the furniture was a variety of colours green, yellow, blue and red. There were six lighting units in most classrooms; the largest had 9 units. The noise level after school time were between 38 – 56 dB, the lowest noise level was 32 -39 dB in classroom located on the west side of the school. The new classrooms have central air conditioning and two ventilation fans, and the old classrooms have two air condition units only. No heating system was provided in any of the classrooms.

Damage was found at this school as shown in Figure 99, with classroom floor tiles broken, the laminated tops of tables and chairs were broken or have graffiti, and the wall concrete was cracked. Lockers provided inside of the classroom or in the corridors were typically broken and could not been used. The windows glass in one classroom was fractured and an uncovered electric socket posed a hazard.

Figure 99. Damage elements in the School C classrooms

The summary of school facility appraisal is shown in Table 15, indicates the overall rating for this school was at borderline. The first section, 'the school site' was afforded the highest score because the site size is large enough and suitable for future development, is also located in the centre of the town. The poor quality of 'environment for education' was recorded because of the poor and non- functional classroom layouts and materials for learning spaces. Other considerations such as the colours, furniture arrangement, acoustics, temperature and ventilation system were not sufficient for quality learning, and did not support the performance of the students.

Table 15 . School C Appraisal summary

Appraisal Summary

Section	Possible Points	Total Earned	Per Cent	Rating Category
1.0 The School Site	100	68	68%	Borderline
2.0 Structural & Mechanical	200	130	65%	Borderline
3.0 Plant Maintainability	100	64	64%	Borderline
4.0 School Building Safety and Security	200	110	55%	Borderline
5.0 Educational Adequacy	200	124	62%	Borderline
6.0 Environment For Education	200	67	33.5 %	Poor
Total	**1000**	563	56.3	Borderline

School D

This school was built in 1987 and is located in Al-Shaab town close to the Kuwait City centre which has a large residential area. The majority of the students belong to non-Bedouins and merchant families. The school is the largest in this research consisting of a two storeys building with 18 classrooms for 500 students (see Figure 100).
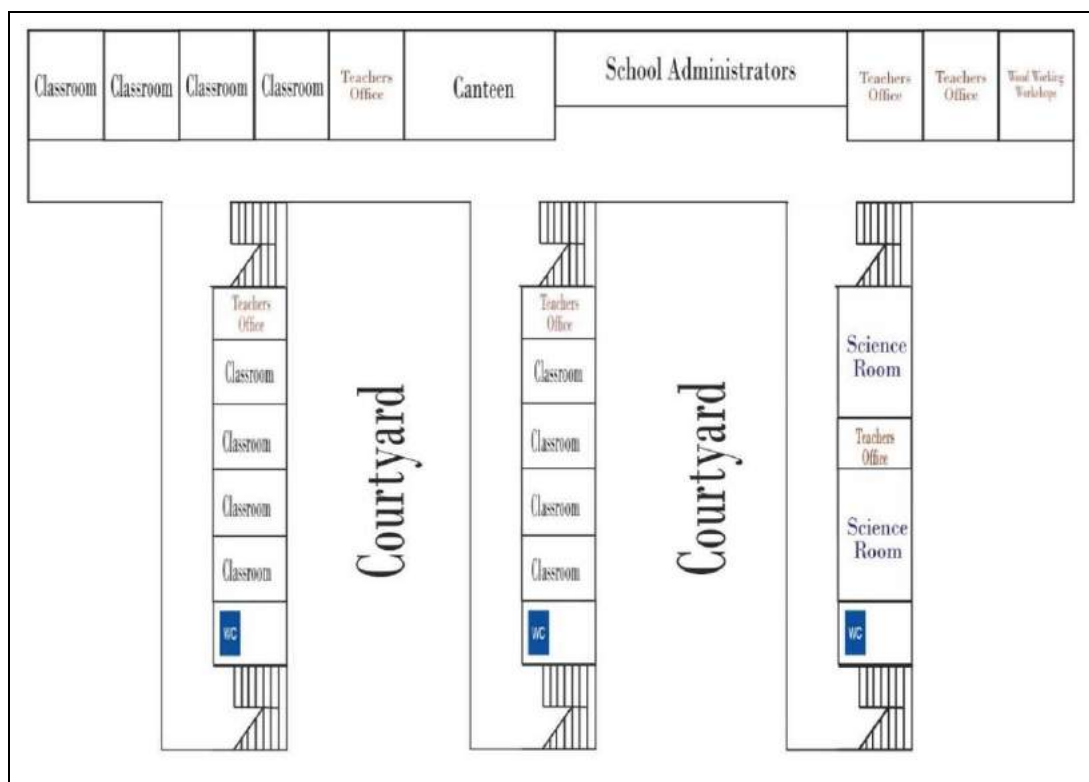
Figure 100. School D school layout

The classrooms are rectangular in shape and are larger in size than classrooms in other schools that were studied. The smallest classroom is 70 square metres, the majority are 82 square metres, and the dimension of the biggest classroom is 12 x 7 metres. Daylight levels varied, depending on the orientation of classroom within the school; the classrooms on the first and second floors have more daylight, than those on the ground floor. Each classroom has six windows, the main three are rectangular opposite to the courtyard, on the other side of the classroom there are three wider windows above eye level (see Figure 101).

Figure 101. The English language classroom in School D

This school has a different system, the classrooms were allocated to each subject department, and for example maths and sciences had dedicated classrooms. Students are required to walk to these classrooms depending on their daily schedule. Each student has their own iPad which is loaded with the subject's curricula instead being provided with printed books. The decorative features of the classrooms were all different, using colours that are mainly beige, green and grey, the English classroom has wallpaper with a decorative mural at the front of the classroom. The seating arrangement was in rows with the same type of furniture as in previously described schools, coloured blue, red, yellow and green. The sciences classrooms used black and grey colours and cooperative seating arrangements, which are more suitable for laboratory classes. The artificial lighting in these classrooms were square fluorescent recessed lighting, smaller in size than wider fluorescent lighting. Each classroom has 15 units, there was no glare noticed in these classrooms. The noise level in these classrooms were between 40 -52 dB in off-school time. Thermal regulation system consisted of two air conditioning units and there was no heating system.

Although the classrooms were dedicated to specific subjects, most were basic and not particularly modified for the subject requirements. As shown in Figure 102, the science classroom functioned as the laboratory having the facilities needed for the science curricula. Students' seating was based on table groups with no social or discussion space provided. The English classroom has a basic display of some English words and alphabet. At back of the classroom two seats were provided.

Figure 102. Science classroom   while the right-hand picture shows the seats in rear of the English classroom.

The overall quality of the decorative features was better than other schools. Some graffiti was found in the classroom and corridors, some furniture was broken, electronic wires were lying in the floor causing a hazard for students (see Figure 103).

Figure 103. Lack of building quality in School D classrooms

The overall appraisal of this school facility is borderline, Table 16 shows that the highest score is 69% for 'the school site' section; the school was large and located in a residential area, but the space not been used effectively. The 'educational adequacy' section for this school was 62%, as the outside landscaped and playing areas met desirable standards in term of size, but miss-used. However, the organisation of the learning environment was basic, group or personal areas were not available in common areas or inside the classroom. Lockers were not provided for students, and the movement between classrooms and corridors is confusing as the interior features were similar.

Table 16. School D Appraisal summary

Appraisal Summary

Section	Possible Points	Total Earned	Per Cent	Rating Category
1.0 The School Site	100	69	69 %	Borderline
2.0 Structural & Mechanical	200	123	61.5 %	Borderline
3.0 Plant Maintainability	100	51	51 %	Bordeline
4.0 School Building Safety and Security	200	107	53.5 %	Borderline
5.0 Educational Adequacy	200	124	62.5 %	Bordrline
6.0 Environment For Education	200	111	55 %	Borderline
Total	**1000**	585	58.5 %	Borderline

School E

This School is the newest school studied in the present research. It was built in 2011, and is located in Jaber Al-Ahmad, a new town. The students in this school are from a wide social and cultural backgrounds. The school design is shown in Figure 104, inspired by western architecture and based on a main square courtyard, with classrooms located on the wings of the courtyard. The size of the school is smaller compared to the older schools, but has been organised and planned more effectively. It includes 18 classrooms for 410 students.
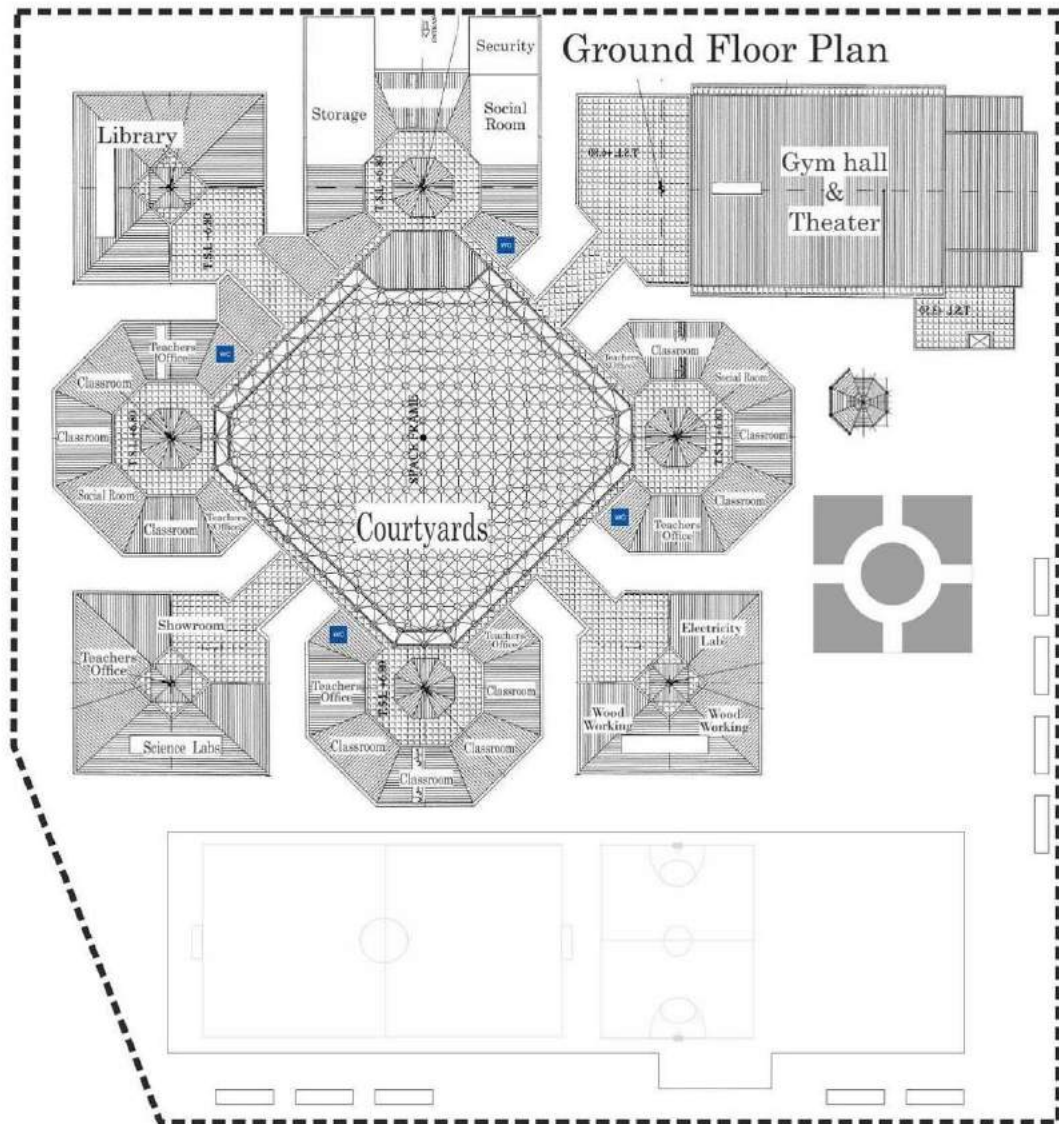
Figure 104. School E plan layout

The layout of the classrooms is shown in Figure 104 is based on a hexagon/trapezoid. The classrooms are smaller in size than the other schools described above, with the focus directed to the front of the classroom where there is a whiteboard with a teacher's desk. The size of classroom is around 52 square metres. The front wall width is around 5.6 m, the rear wall is 8.6 m, and the two side walls are 6 m (see Figure 105). There are 25 students per classroom which is the same as in the older schools, where the classrooms were bigger using a standard rectangular layout. Four windows are located in the rear corners of the classroom; each corner has one rectangle size window of 185x150 cm and a vertical window (190x65 cm). The natural lighting depends on the orientation of the classroom.
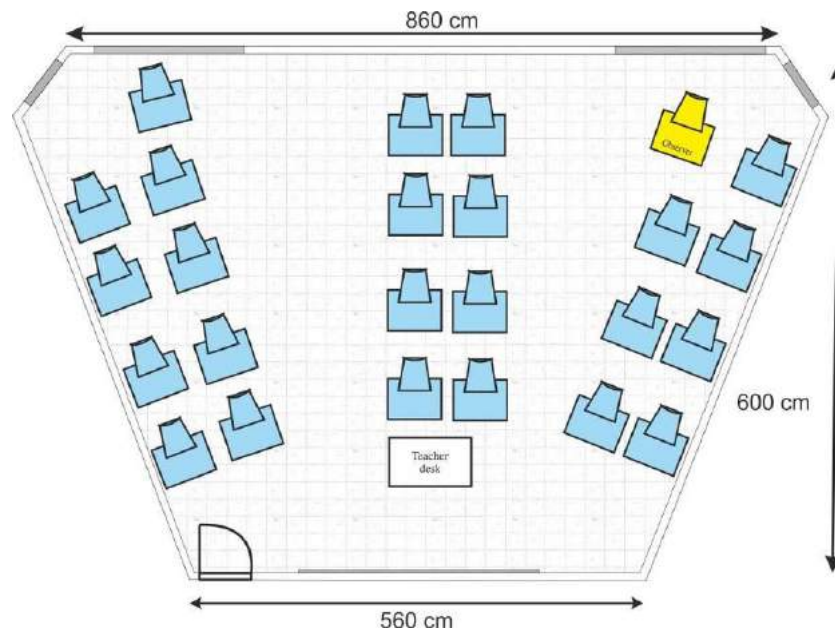
Figure 105. Classroom layout at School E

The selection of classroom colours varied as shown in Figure 106; the majority of the classrooms had a unified colour of wall and furniture. For example green, purple, yellow and red; while some colours were intense and not conducive in a learning environment. The ceiling terrazzo tiles were white in all classrooms which highlighted the contrast between these colours. Yellow and green classrooms gave a sensation of coolness, but not comfortable and distracting for students. One classroom was painted dark red and the furniture had red laminated tops which was intense colour. The seating arrangement was in row, the corner at the back of the classroom space left unused (see Figure 106). Students used their desks to store their bags and belongings, as there was no lockers provided inside the classroom or even outside.

Figure 106. School E classrooms

The lighting system was 15 square fluorescent units in each classroom; the daylight in some classrooms was controlled by roller blind to reduce the glare and heat. In one classroom, the glass brick wall was covered with paper to reduce the natural light. The noise level was between 39 to 52 dB during off school time. There was a central air conditioned unit in each classroom and thermostat to control the temperature. The ventilation systems were built into the central system, but no heating system was provided.

Figure 107. The facilities in the classroom of the School E

The quality of physical features in this school was better than the other schools in the research; the school administrators were aware of the importance of environment in education. The school environment encouraged students to socialise and engage with the all facilities in the school. In their free time, students used all sections of the school; they wore traditional uniforms, enjoyed buffet food in the break time in courtyards, and many types of sport equipment was provided for students in the main courtyard. As shown in Figure 107, classrooms also have projectors, computers and speakers provided for lessons.

This school facility appraisal has the highest score in this research; the overall rating is 'satisfactory' as shown in Table 17, even though the school site was smaller than other schools studied, the planning and organisation of the school sections and wings were used efficiently. The school layout allowed suitable circulation around the school compared to the old schools. Both the exterior and interior environments were at an appropriate standard. The interior colour scheme was not successful. In the appraisal summary, the 'educational adequacy' indicated a low score, as the size of the classrooms and learning facilities were

small. The density of students is high for the capacity of classroom; there is no space for students inside the classroom for small group activities or personal study and break spaces.

Table 17. Al-Saqaf school Appraisal summary

Appraisal Summary

Section	Possible Points	Total Earned	Per Cent	Rating Category
1.0 The School Site	100	77	77 %	Satisfactory
2.0 Structural & Mechanical	200	149	74.5 %	Satisfactory
3.0 Plant Maintainability	100	74	74 %	Satisfactory
4.0 School Building Safety and Security	200	126	63 %	Borderline
5.0 Educational Adequacy	200	132	66 %	Borderline
6.0 Environment For Education	200	143	71.5 %	Satisfactory
Total	1000	701	70.1 %	Satisfactory

Summary of the physical survey

The physical features were evaluated in the selected schools, which included both old and new intermediate school buildings in Kuwait. The overall quality of the learning environment varied and depended on the school age, location and physical features. The investigation showed that the educational buildings, especially the classroom arrangements, were mainly formed for the purpose of teaching; the space was designed to support teachers to deliver the curricula to the students. The next section describes the findings of the observation method to support the physical survey outcomes that analysed in chapter seven.

Observation

As discussed in the methodology chapter, the observational survey created the opportunity for both quantitative and qualitative data to be gathered in support of the research objectives, for example the participants' behaviour, movement, actions, interaction and performance during classtime *(Yin, 2014; Creswell, 2009)*. Observation is part of the research methods used to understand and reveal behavioural influences that are difficult to investigate by other means *(Punch, 2014)*. Thus, a fully engaged observation approach was used for this research. This strategy also provided additional information for the research to supplement the physical survey.

The purpose of the observation is to evaluate the influence of the classroom environment on the students and teacher's performance, interaction and behaviour, during the taught session. The intermediate school system has four stages from year 6 to year 9. Students' ages range from 11 to 14 years. The observation was undertaken in one classroom for each stage (Year 6, 7, 8 and 9), in order to collect responses of different age groups. In total, 20 observation sessions were undertaken within the selected five schools. The collected data is based on particular checklists developed for the observation methods (see Appendix D), Figure 108 shows a sample of the observation notes that were collected in one observed classroom. These findings of the observation divided into two categories:

First: To assess the quality of the physical setting and its impact on learning quality.

Second: To observe the impact of the classroom settings on the students' and teachers' communication, movement and performance.

Figure 108. An example of the observation notes that collected for this research.

Observation finding in the selected schools

First: Assessing the physical setting and its' impact on the learning quality.

It involved recording the classroom shape, colour schemes and materials, lighting, students' seating arrangements, lockers, displays, noise levels, and temperature.

Classrooms shape

Figure 109 shows the classroom configuration of the five chosen schools; one school has trapezoidal room shape. The classrooms in schools 1 and 4 are rectangular in shape, and in schools 2 and 3 they are square, while school 5 had hexagonal/trapezoidal layout.
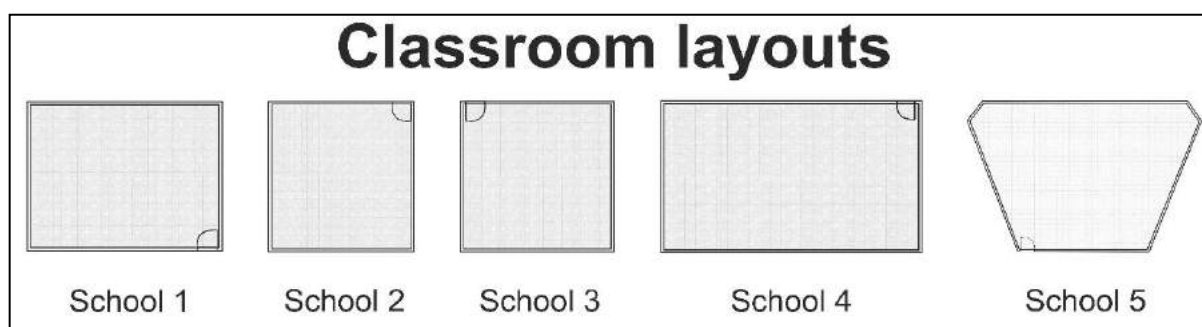
Figure 109. The classroom layouts in the selected schools

Classroom colours and materials

The following observation of the five schools indicated that a classroom's circumstances do have an impact on the student's concentration and behaviour. For example, the classrooms with brighter colours created a quiet educational environment, where students concentrated better with the teacher. While the classroom that had dark and intense colours seemed to cause distraction and disruptive behaviour. The literature identified the effect of colour on learning quality (see page 82).

School 1:

The year 6 classroom colour is shown in Figure 110, with pink and green painted on the back wall and beige ceramic tiles on the floor. Students in this class did not focus on the teacher and talked with each other during the class. The sharp colours that were used may have contributed to the distraction of the students. Year 7 classroom was painted beige, the teachers used light blue markers on a whiteboard, which was not clearly visible. Year 8 & 9 classrooms were painted green and yellow stripes on the front wall, while the back and side walls were painted white and yellow; students in these classrooms were attentive. All painted walls were using semi-gloss emulsion which increased reflection of light in the classroom. The ceiling and mosaic terrazzo tiles were white.

Figure 110. Classrooms in School 1 painted with pink and green colour

School 2

As shown in Figure 111, all classrooms wall were painted beige, furniture was a variety of bright colours green, red and yellow. The ceiling has white prefab concrete and mosaic terrazzo tile flooring. This mixture of colours was balanced between the use of light-coloured walls and bright coloured furniture; it seemed appropriate in not distracting the students' attention.

Figure 111. Classroom in School 2 was painted beige colour.

School 3

Three classrooms were painted blue which dominated the space, making the room look dark (see Figure 112); students appeared distracted and were not paying attention to the teacher. The year 6 classroom was painted beige which looked brighter than the blue classrooms (see Figure 113); students seemed to be focused on the teacher. The ceiling was painted matt white and the floor was ceramic in the year 6 classroom; which reflected the daylight in the space, where the other classrooms have mosaic terrazzo flooring.

Figure 112. Classroom in School 3 has blue colour
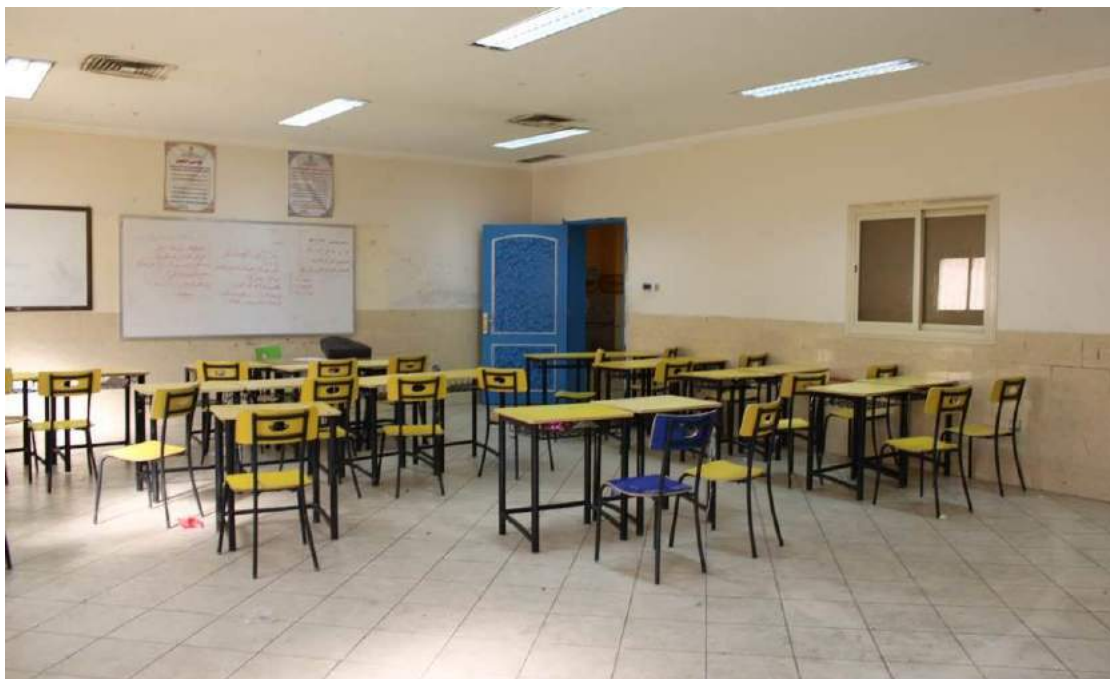
Figure 113. Year 6 classroom in School 3 has beige colour

School 4

This school's classrooms were dedicated to subjects. The science lab had more than six colours, creating a very distracting space (see Figure 114 - right). The colours were beige walls and white ceilings, with black table surfaces, and chairs were having variety of bright colours. There was red blind window and the wall behind the teacher was green. Other classrooms used fewer colours, beige in Arabic subject classroom (see Figure 114 - left), and light grey in the English language classroom; these were more comfortable and quiet. Square ceramic floor tiles were used in all classrooms with white plasterboard ceilings.

Figure 114. Classroom colour in School 4 has beige colour, while the science lab combined of many colours.

School 5

Bright and intense coloured classrooms were observed throughout this school, which had differing impacts on students (see Figure 115). Year 6 classrooms had two tones of light green paint on in the walls and furniture, a beige carpet and white ceiling. The Year 7 classroom was purple on the back wall with white on the surrounding walls and ceiling; the furniture was all green. The wall spaces in this school were left blank or unfinished with no educational displays. Two classrooms for Year 9 used colours that creates a sense of crowding and distraction, with one is painted in a light green and blue. Desks were blue, chairs were yellow and the window board was red. The second year 9 classroom had red painted walls and furniture, which was very distracting.

Figure 115. Classroom in School 5 shows that green colour was dominated the space, while a mix of light green and blue creates the senses of crowding.

Lighting

The artificial lighting system in all classrooms were ceiling mounted, and daylight levels varied. The literature discusses the consideration in term of the learning environment lighting (see page 81). This section is describing the lighting condition during the observation.

School 1

Daylight in the classroom was appropriate in Year 6 and 9 classrooms, with blinds left open to allow natural light in to the room. Glare coming from the artificial lighting units was noticed on the whiteboard and also off walls due to the use of glossy paint (see Figure 116). Year 7 and 8 classrooms were very dark; the closed blinds let little sunlight into the rooms. The artificial lighting units were not working. The written illustrations made by the teacher on the whiteboard were small in size, and a light colour marker used, making it difficult to recognise what was written. Year 6 classroom windows overlooked to the playground; the windows were covered by a frosted poster to reduce distraction that could cause for students.

Figure 116. School 1 classrooms show the natural lighting was causing glare in front of the space.

School 2

Daylight was available in these classrooms at a variety of levels and was supported by artificial lighting as shown in Figure 117. The Year 6 classroom, however, had poor natural light levels and all the fluorescent lighting units were turned on, but these did not give sufficient light. The Year 7 classroom had large windows allowing direct sunshine into the room that caused glare on the whiteboard and walls. In Year 8 and 9 classrooms, the natural light was sufficient and the teacher turned off the artificial light when he used the projector, the vision was clear and no glare was caused.

Figure 117. Classroom lighting in School 2 shows poor natural lighting in the internal space.

School 3

In Years 7, 8 and 9, classrooms were painted blue; there was poor natural light during classtime. The fluorescent lighting units appeared to be inadequate: the classrooms were still dark. Shadows were noticed when the students were writing due to the inadequate lighting, and the natural lighting had no impact in the space (see Figure 118- left). The Year 6 classroom had better natural light entering the space which improved the visual quality in the classroom for the students (see Figure 118- Right).

Figure 118. Classroom lighting condition in School 3, the natural lighting was poor in the majority of the classroom, while year 6 classroom has better daylight.

School 4

The science lab (Year 9) and English language classroom (Year 8) had poor natural light quality, the space appeared dark and closed blinds stopped the daylight entering the space. Artificial lighting was the only source of light in these classrooms. Students appeared inactive during the teaching. The Arabic classroom (Year 7) had no blinds provided, allowing daylight to enter the class, and the artificial lighting units had no effect during the class (see Figure 119). The Year 6 classroom had better daylight with support of the artificial light units; students in these classrooms were more active during the class hour.

Figure 119. A classroom in School 4 shown the daylight was not controlled properly.

School 5

The amount of light in the classrooms was poor, the natural light was strictly controlled during the class hour via blinds and a glass brick wall (see Figure 120 – left). The artificial light was the main light source in the classroom areas. The light units were spaced in the ceiling, reducing the glare effects on the whiteboard and on the students' desks. The Year 6 classroom had lighting that was appropriate for students and teacher activity during the class hour, the blinds were not used and all artificial lights were switched on (see Figure 120 – Right). Other classrooms had less light due in part to light units not working, and the orientation of the classrooms affecting daylight levels.

Figure 120. Lighting level in School 5, shows the left classroom has poor light quality, while the right classroom has better daylight and artificial light

Seating arrangements

The type of seating arrangement inside the classroom has a strong correlation with the learning quality (see page 77). The details of the seating arrangements for each school are described in this section.

School 1

In this school, two types of seating arrangement were found as shown in Figure 121. First was the row seating arrangement, organised as two lines on each side and three lines in middle of the classroom, with 3 to 4 students sat in each row. Students were interacting with each other in the side and middle rows as the distance between them was small. Students in the corners or at the back areas were less able to interact. The second type was cooperative seating, which was organised as U-shape in three rows in the middle. Students in this seating arrangement were more engaged with the lesson and could converse with their colleagues; this worked much better than a rows arrangement.

Figure 121. Row and cooperative seating arrangements were used in School 1

School 2

All observed classrooms had seating arrangement in rows as shown in Figure 122. There were more desks than student's number in two classrooms. Furniture was organised into 5 -7 rows of 4 to 5 students, with extra furniture was placed in the corners. The back row was linked as one row, while the other rows were placed in evenly. The distance between each row varied; with small distances, students talked with each other more than when furniture was spaced farther apart. The overall organisation of seating arrangement was confusing; students who sat by the wall rested on the wall instead of their chairs.
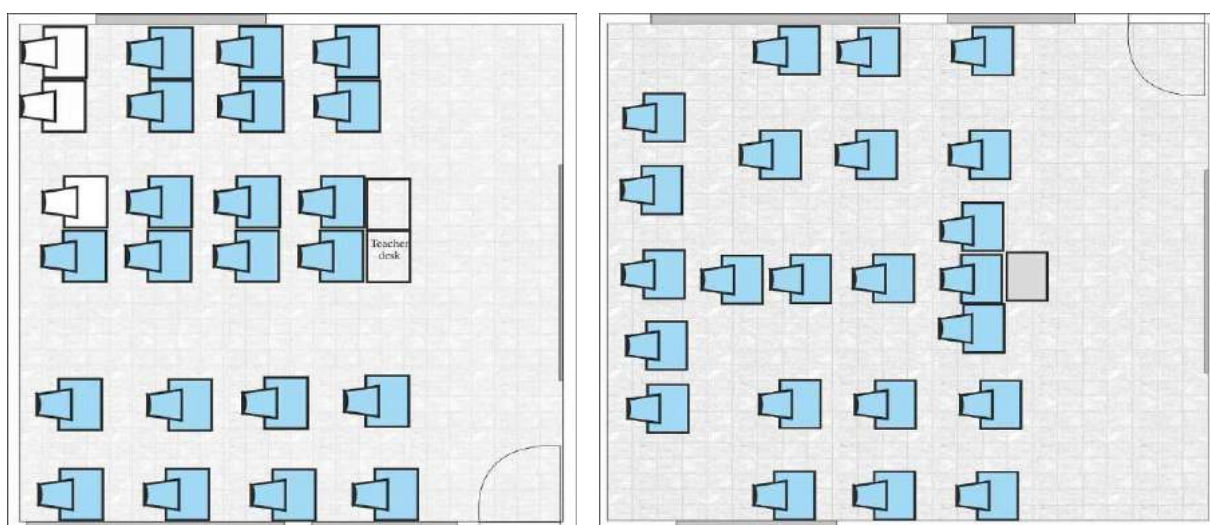
Figure 122. Row seating arrangement in School 2

School 3

The four observed classrooms were organised in uneven rows (see Figure 123). The Year 7 classroom was very crowded, and the furniture grouped in the middle of the space, distracting the students and restricting the movement of the teacher in the classroom. Students seated close to each other in the front of the classroom distracted each other and the teacher during the class hour. In the Year 9 classroom, the students were seated individually and the space between each row was more than 80 cm, but many students did not concentrate on the teachers during the class session.
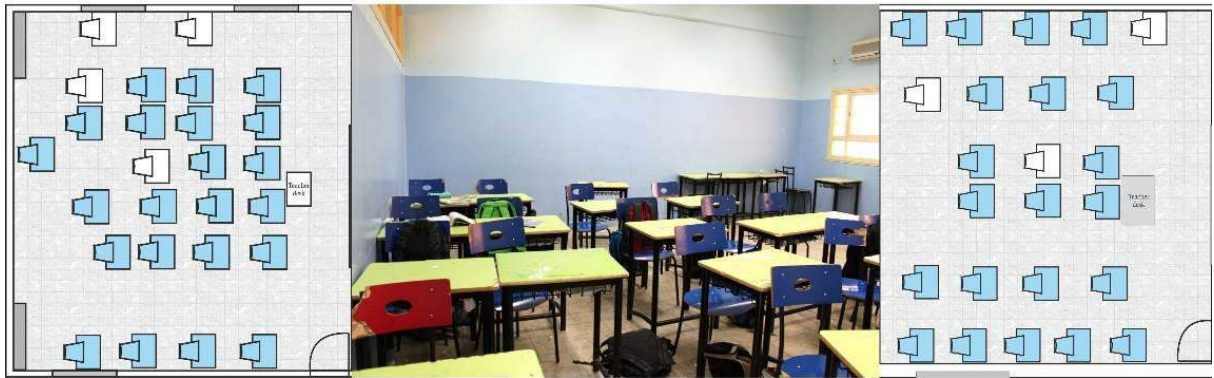
Figure 123. The seating arrangement in School 3 was in rows, the distance between each student was not balanced

School 4

As mentioned earlier, the classrooms in this school are dedicated to subjects, and students move to these classrooms depending on their daily schedule. Four classrooms were observed in this school (Figure 124); two English language classes (Years 6 and 8), a science class for Year 9, and an Arabic language class for Year 7.

The seating arrangement in the science classroom involved group tables fixed to the floor. Student interactions in this classroom were less as they were concentrating on the teacher. Other classrooms were arranged in rows with two or three lines on each side. The distance between each group was varied and unbalanced which increased the student's interaction with each other.

Figure 124. The seating arrangement in School 4 were usually rows, just the science lab was organised as group arrangement

School 5

The seating arrangement in this school was in rows in all classrooms; each classroom had six rows divided to the right, left and middle (see Figure 125). Student numbers in the classroom were between 17 and 21, a more manageable number than the large student density in other

schools. The classroom layout was hexagon/trapezoidal, the distance between each seating group was not same, wasting a lot of space in the classrooms. The Year 6 classroom was organised better than others as the distance between each row lines was same. The seating arrangement in these classrooms was not flexible and created a lot corners and small spaces that could not be used properly such as the back corners and the space between the rows groups. Additionally, at the end of each class hour, all students ran out of the classroom which packed them all in the t-zone[5], the layout and the seating arrangement did not suit that issue.
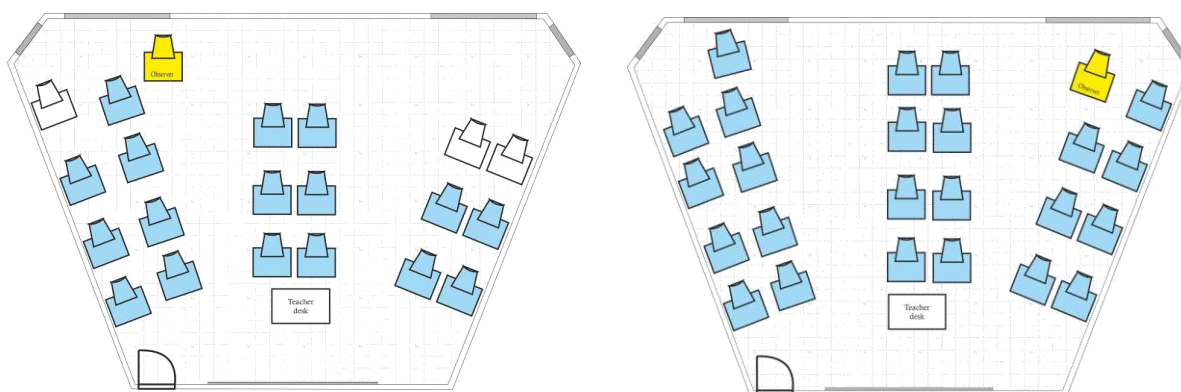
Figure 125. Rows seating arrangements of the hexagon/trapezoidal shape classroom in School 5

Lockers and displays

The availability of lockers units and display materials inside the classroom have many benefits, which were discussed in the literature. In this research, the students' storage and displays varied in the five schools studied as illustrated in this section.

In s**chools 1**, **4**, and **5** no locker facilities were provided inside or outside the classrooms. Students kept their belongings with them during the class hour, using their school bags and their desk drawers for storage. In some classrooms, it was observed that students hanged their school bags on their desks or chairs, creating a sense of disorganisation (see Figure 126). In **school 4**, although that each student has an iPad used instead of printed books, no secure locker was given to the students for store their iPads. In **schools 2** and **3,** lockers were inside the classroom or in the corridors, students did not use them as most of these units were broken.

---

[5] Teacher zone is the front area of the classroom that have the teacher's desk and the whiteboard.

Figure 126. The ways that student store their belongings inside the classroom

In regards of classroom displays, **schools 1** and **5** had instructional posters and school rules inside each classroom. A book shelf on the back wall was seen in **school 1**, however, students did not use it during the observation period. In **school 4**, displays in the science lab were spread around whole room describing many science details. The English classroom (Year 8) had a decorated display about the English language not relevant to the lesson; these displays were not used during the class. While in **schools 2** and **3** there were no displays in the classrooms. Therefore, the overall conclusion in terms of the classroom display is that there are not enough display found regarding the curriculum or the students work.

Noise

The quality of acoustic environment inside the classroom has crucial impacts on learning performance, which has been discussed in the literature (see page 84). The noise level inside the classroom were observed that indicated in this section.

School 1

The overall noise level was between 51-86 dB during lesson time, the noise level increased in discussion time. The noise level in the newly built classroom (Year 6) was 63-73db which came from the corridors and the play yard located next to the classroom. The teacher closed the windows and the door reducing the noise level slightly. The teachers' voice in some classes created an echo which was distracting for students.

School 2

The noise level was high in the Year 6 classrooms, but decreased dramatically in Year 9 ones, as influenced by the students' age. A noise level of 60 -96 dB in Year 6 classrooms recorded,

which is too high in a learning environment. Year 7 classroom were 60-85 dB, and Year 8 was 50-68 dB, the lowest level was 40-58 dB in the Year 9 classroom. Other noise sources occurred from outside areas like the corridors, playing ground, and from the echo inside the classroom.

School 3

The noise during discussion time in the Year 6 classroom was 70 to 84 dB, while for Years 7, 8 and 9 was between 52 and 84 dB. Noise was created from the echo of the teacher's voice when speaking loudly and also from the movement of the student's furniture. The ceiling in the Year 6 classroom was lower than other classrooms and the ceramic tile floor elevated noise levels. Some noise came from other classroom activity; it was possible to hear what the teacher was saying in a neighbouring class.

School 4

The noise level in all classrooms ranged from 61 to 88 dB during the observation. In the science lab, the noise level reached 78 dB because loud music was coming from the music room above. The English and Arabic classroom (Year 7& 8) were 68-88 dB, the teacher's voice echoed since the classrooms' structural materials including ceiling and tiles were not designed to absorb noise.

School 5

The Year 6 classroom had a lower noise level and the teacher's voice was clear during the class lesson. The floor was carpeted absorbing any noise between 55 -69 dB in discussion time, less than other classrooms. Year 7 and 9 classrooms had noise levels between 60 and 81 dB in discussion time, and after opening one window the noise level increased.

Temperature

The quality of thermal environment inside the classroom is an important factor affecting learning quality (see page 87). Temperatures in Kuwait are very hot in summer, between March until November. From November until February, the winter temperature drops down slightly to 5°C. The observation conducted in December was in middle of winter session. The general reaction and behaviour for the student were observed in this investigation, which detailed below.

The students' reaction to temperature in the classrooms varied depending on the classroom orientation, cooling facilities and ventilation quality in each school. Each classroom has a cooling system, mostly two air-conditioning units or a central cooling system; these are turned

off during the winter period. Additionally, no heating systems were provided inside the classrooms.

School 5 has an individual thermostatic control been in each classroom; the classroom temperature in this school was appropriate to the students. In **schools 1, 2, 3 and 4,** the observations demonstrated two types of classroom temperature quality:

1. In cold classrooms students wear jackets, gloves and head coverings during class time. Open windows (for ventilation and circulation of air) were still needed however (see Figure 127).

Figure 127. Students wear jackets in School 1 during the teaching time.

2. In reasonable temperature classroom students feel comfortable with the normal temperature and behave more naturally when doors and windows were closed and no ventilation systems were needed.

Second: <u>Observing the impacts of the classroom physical settings on students and teachers' communication and performance</u>

The structured observation that applied for this research aimed to evaluate behaviour of the participants as discussed in chapter three. The second category of the observation purpose to achieve the following targets as mentioned in chapter three:

- The relationships between the classroom users and their physical features through their behaviour, attitude, experience, activity and performance were to be examined,

- Observing the teachers' role in the learning environment and the ways that they organise the spaces for their teaching were to be considered.

These discussions illustrate the students' and teachers' movement around the classroom, and the classroom facilities. Classroom shapes are different in each school as mentioned earlier, Figure 128 shows the classroom layout in each school.
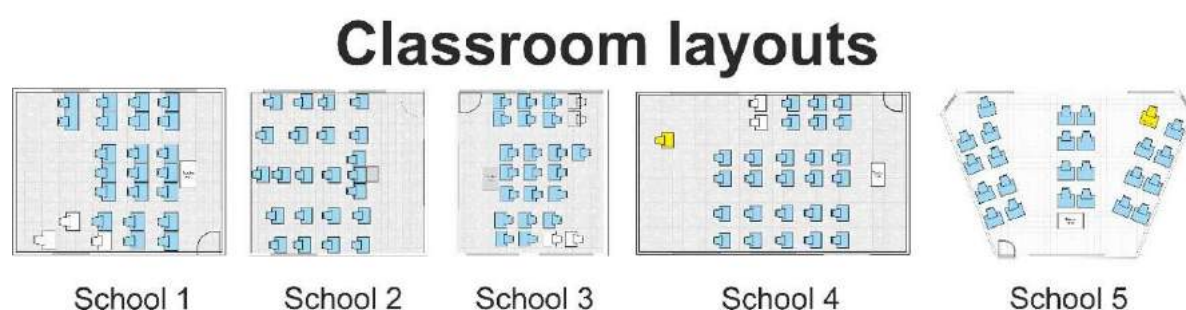
Figure 128. Classroom layouts in general

Students' movement

The observation outcomes of the student movement inside the classroom is discussed in this section. Each student had an allocated desk in the classroom, which was not allowed to be change without permission of the teachers or school administrators. Except when there are dedicated rooms for specific subjects. These places are usually allocated on the first day of school when students choose where to sit. Movement during the class time is restricted;

students are not allowed to move without teacher permission. In **School 3**, although students' movement was not allowed, some students changed their seating position during the class time without teacher permission. While in the other classrooms the students were able to move freely inside the classroom after teaching time; they socialised with their colleagues and had discussions with the teacher. The teaching style in some classrooms encouraged students to participate during the lesson by asking questions and letting them write the answers on the whiteboard. The overall opportunity for movement for the students were poor; they were seated and listened to the teachers during the lesson. The illustrations of student's movement (red lines) are shown in the following section.

The classrooms in **School 4** were interchangeable; student's seats were not allocated like other schools, as they were able to choose their place as first come first reserved. Students seemed to prefer to occupy certain seats by habit. Students were given a permission card signed by their teacher allowing them to leave the classroom for an acceptable reason.

Teacher's movement

Interaction and communication between the teachers and students inside the classroom is one of the key characteristic of classroom management for effective learning performance. Chapter three (see page 80) highlighted that teacher circulation and location during the teaching time increases positive learning behaviour. This section illustrates the teacher's movement and location in the observed classrooms.

School 1

Teachers' movements were through the teaching zone (T-Zone), which is the front of the classroom close to the whiteboard. As shown in Figure 129, the rows and cooperative arrangement has less effect on the way that teacher moved in the classrooms. Teachers mostly circulate around the students who sat in middle desks, and less movement appeared in the corners of the classrooms. Teachers in cooperative seating arrangement were able to reach all students better. The active zone in the classroom was the middle space, for teacher and students and especially the teacher's position as shown in the movement plan.

Figure 129. Students and teachers movement in School 1

School 2

The teacher movement was limited and commonly in the T-Zone area also (see Figure 130). Students who were in the back of the class did not participate like those at the front. As shown in Figure 130, the teacher in Year 9 classroom has better movement; he also used a projector in teaching. Students in this classroom were motivated and performed better than other classrooms.
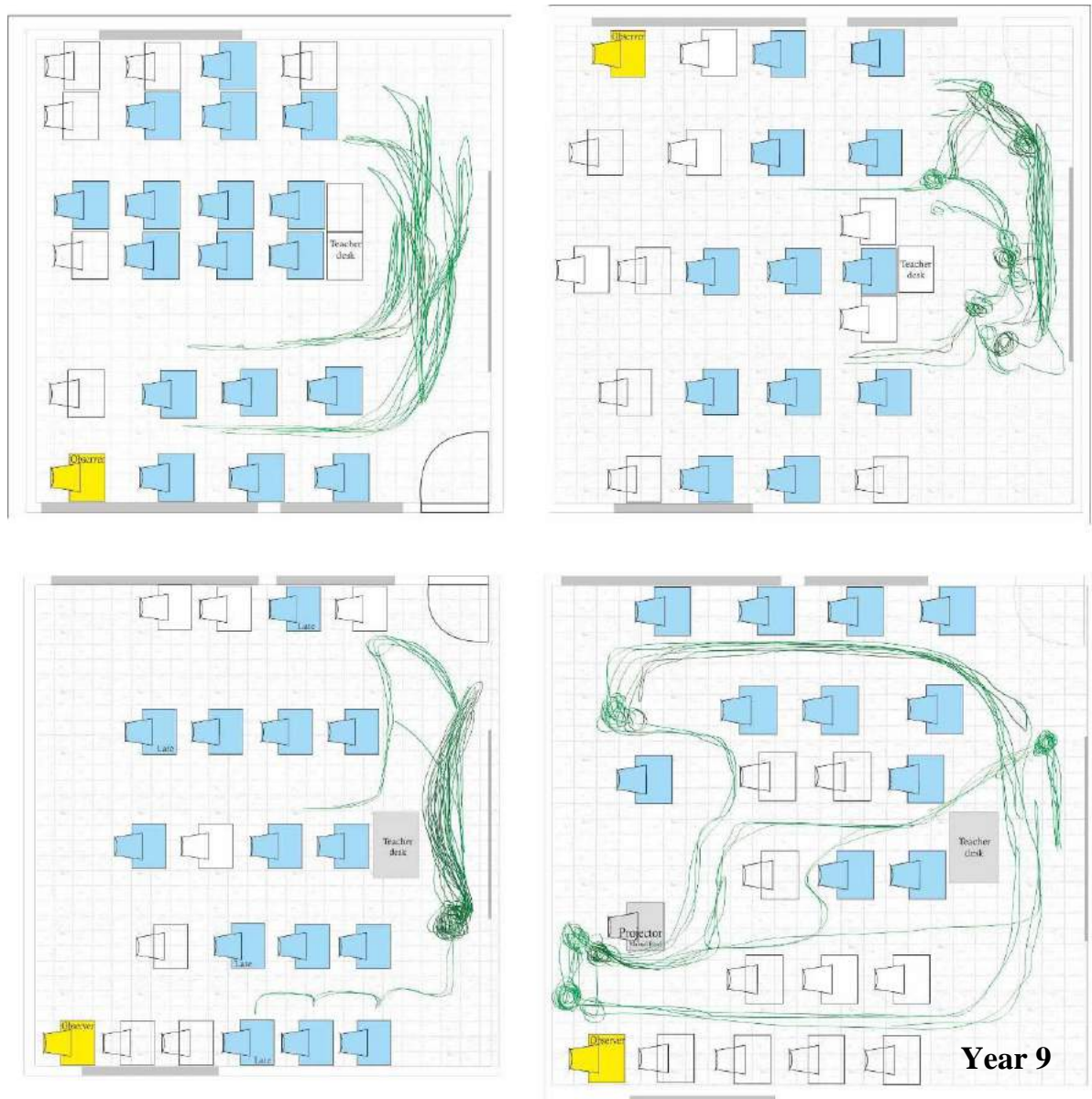
Figure 130. Teachers movement in School 2

School 3

Teacher movement was limited inside the classrooms, only using the T-zone area. The seating arrangement was not balanced as the distance between each desk caused difficulties for teacher to walk through. Most of teachers stood in front of the whiteboard (T-zone) most of the time. While the Year 6 classroom teacher moved more frequently during the classroom hour, and students in this classroom were more active (see Figure 131).
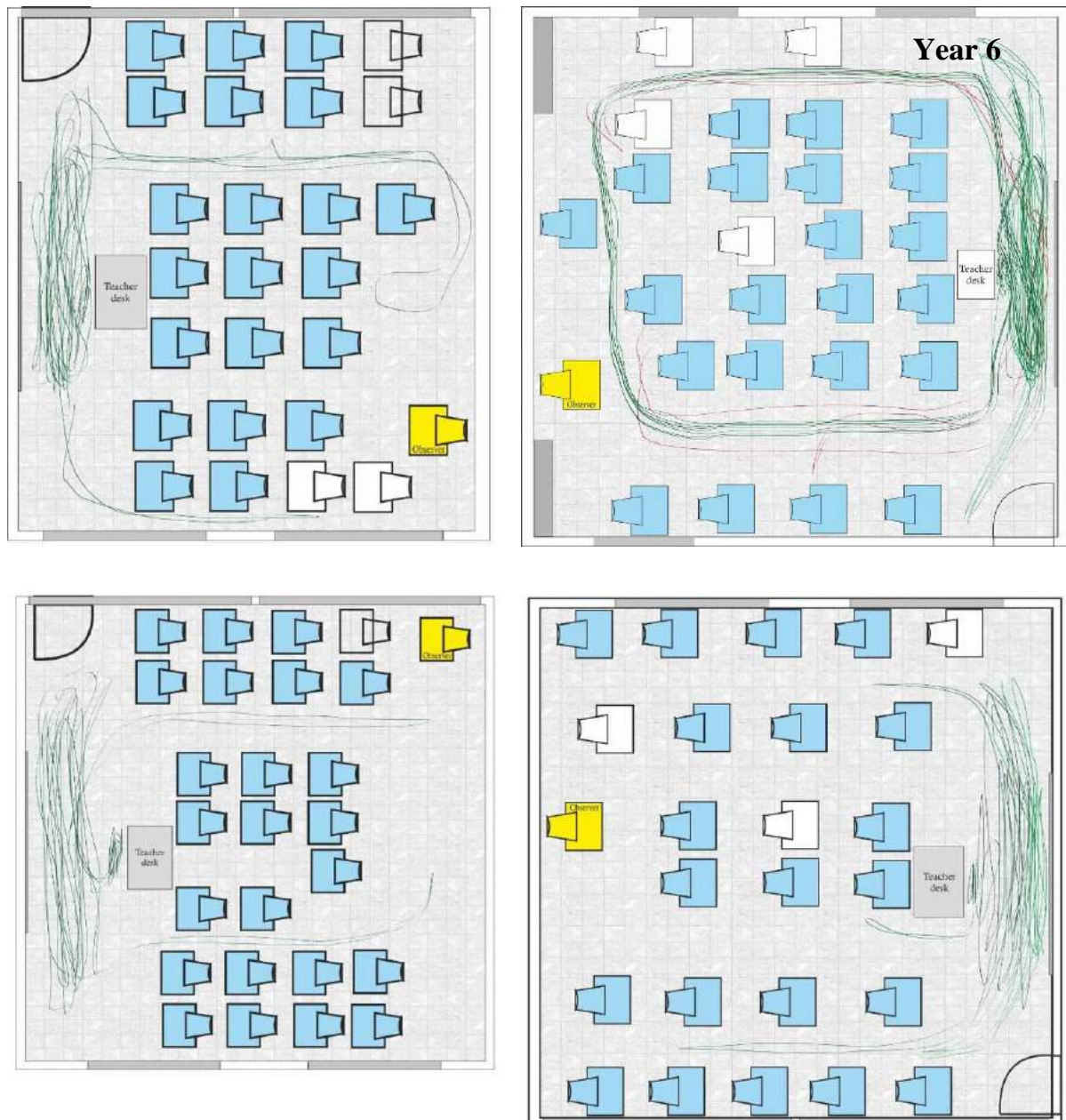
Figure 131. Students and teachers movement in School 3

School 4

The teachers' movement during the lessons was limited in this school. The teachers walked and stood in the T-zone area only, or sat for half of the class hour in their seats. The English subject teacher as shown in Figure 132, walked down the middle of the classroom for a short time only; students increased their interaction during this time. Students who were seated at back area did not engage like those at the front. Students were observed playing games with iPads during the English class hour which the teacher did not notice.
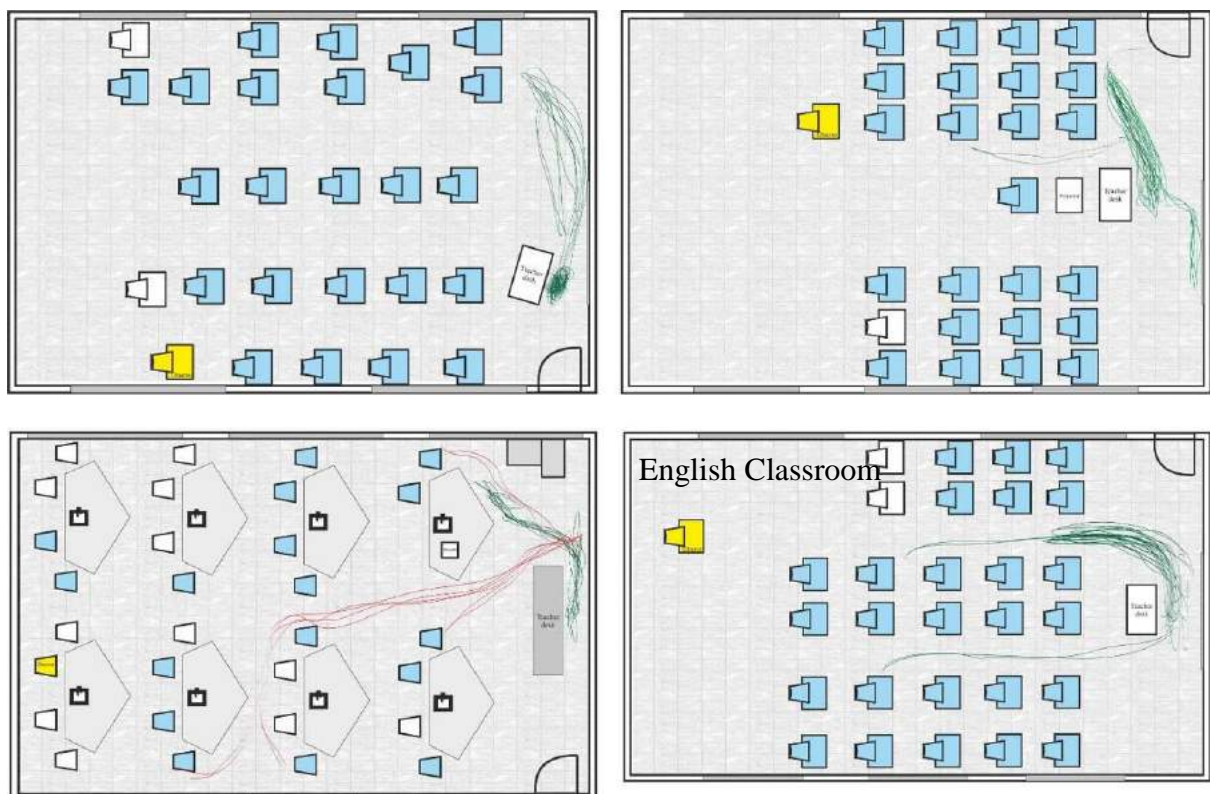
Figure 132. Students and teachers movement in School 4

School 5

The size and layouts of these classrooms were smaller than those in the other schools (see Figure 133). The space at the back of the classroom was larger than the T-zone space, which affected the teacher's movements. Teachers spent most of the class time in the teaching zone and sometimes between the students. The seating arrangement in these classrooms was not flexible, which caused a sense of crowding that reduced the teacher's movement. Additionally, although the back space was larger than front space, teachers did not used this space effectively and remained in the small T-zone area.
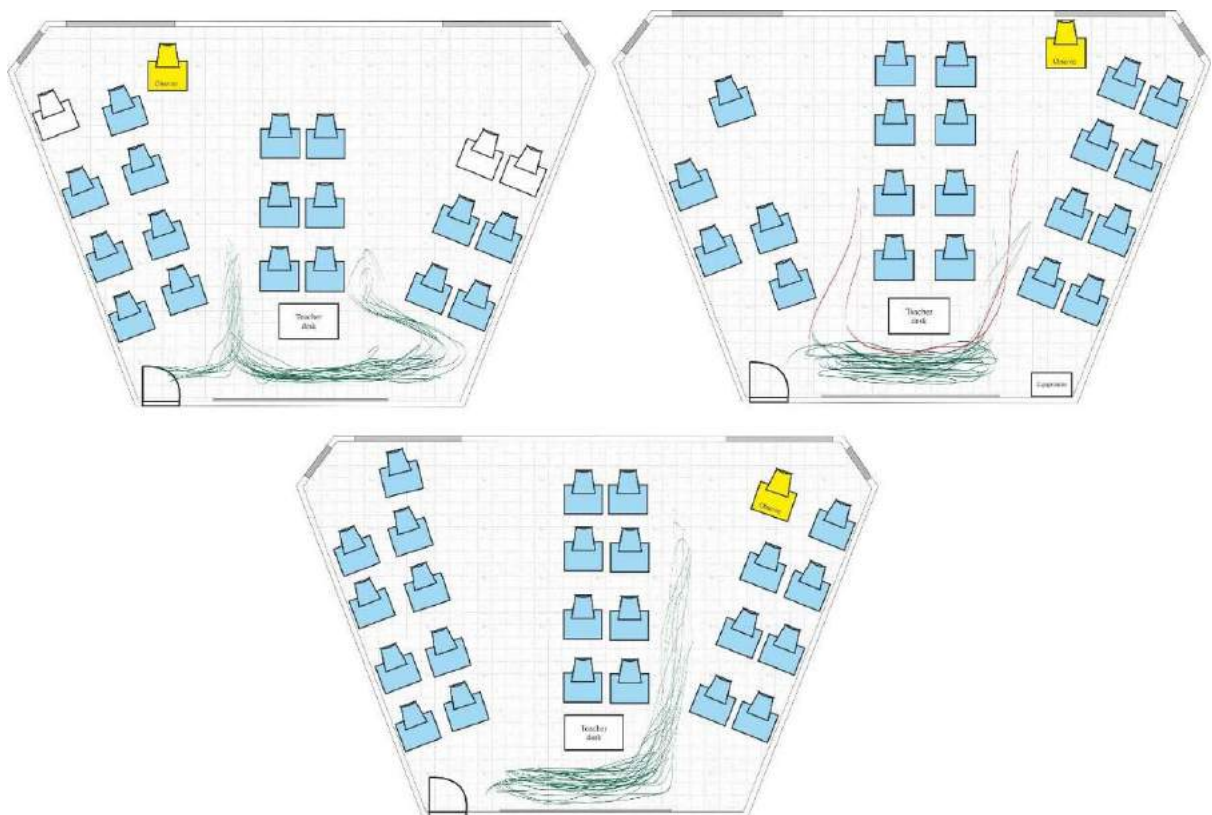
Figure 133. Students and teachers movement in School 5

Classroom facilities

Providing a variety of zones, spaces and facilities enhances the students' learning performance, and reduces the negative effect of density inside the classroom (see page 76 and 79). The orientation of the classroom arrangement, and teaching facilities provided in the classroom were observed, and are briefly presented in this section.

All classrooms within the five schools were used as teaching areas only, although some of the classroom sizes were large and suitable to provide variety of zones. No place had been allocated for alternative activity, personal learning, IT facilities, and group work inside the classroom. In **School 1**, a small bookshelf was provided at the back of classroom that had small booklets only. In **School 3**, two sofa chairs were provided in the classroom, but were not used during the lesson. The observed teaching facilities were limited in these classroom, with just whiteboards provided. Other facilities are illustrated below:

- **School 2**: An overhead projector in the Year 6 classroom was connected to an electric socket needing an extension cable, which lay on the floor causing a hazard. The Year 9 teacher brought his own projector and iPhone and showed articles and pictures of the water hygiene quality. The students' performance attention was noticeable as they paid more attention to the visual aids provided.

- **School 3**: The teacher in Year 7 used his own laptop to show pictures during the lesson, the screen was too small to been seen properly, so that only the students seated in the first row were able to see. While in Year 8 a recorded conversation was played through an Mp3 player; the speakers were poor quality and noisy to listen to, creating an echo in the classroom.

- **School 4**: Three classrooms had projectors and a laptop connected to the teacher's desk, each student had an IPad to be used in the classroom.

- **School 5**: Each classroom had a computer and speakers in the corner of the T-Zone; these were linked to a projector installed in the ceiling and a projector board fixed above the whiteboard. These facilities were easily accessible for teachers to use, all observed teachers used these facility in their class. However, the projector board was not fixed safely in the Year 7 classroom, as it had fallen to the floor, presenting a hazard for students and the teacher in the classroom. Additionally, the teacher asked students to stand on a desk to turn the projector on or off due to a missing remote control.

Summary of the observation

The description of the observation shows the influence of the classroom environment on the students' and teachers' performance, interaction and behaviour during the class time. Two categories were evaluated; first was about the quality of space that support the research findings. Second focused on the impact of classroom circumstances on learning and teaching performance that complement the physical survey outcomes. The arrangement and facilities enhance the teaching provision, while learning experiences and performance had less attention. The observed classrooms were different in quality; these variations had important influences on the overall experiences. The physical survey and observation data were based on the actual quality of the learning environment. The following section evaluates the feedback and concerns of the learning environment users.

School inventory survey (Questionnaires)

The inventory survey is a questionnaire method that collects general views, attitude and facts from vast number of participants in the certain research field. It can cover large geographical areas and is flexible for quantitative and qualitative data *(Burton and Bartlett, 2009)*. Three questionnaires were designed; for students, teachers and the school administrators. Aimed to assess the quality of the school buildings within their point of views. These questionnaires also collected the response and concerns from these participants, which enhanced the understanding and outcomes of the physical survey and the observation. The sample numbers are shown in Table 18.

Table 18. Questionaries' sample

Questionnaires sample:	Collected Number	Schools number
Students	613	5
Teachers	168	5
School Director	18	18

Students' questionnaire:

The questionnaire had 20 questions that asked the students for views and opinions regarding the physical features of their classroom and school (See Appendix E). The questions are based on 'yes/ no' responses appropriate for students' age group (11-14 years old) as suggested in the pilot study. These represent and reflects the student beliefs and thoughts upon their physical learning environment, which identify the weaknesses in school building *(Sanoff, 2001)*. The questions are based on a simple style focusing on the collection of the positive and negative response.

The total sample collected from the five schools is 613 responses this sample was not equal for each school. Therefore, the response percentages of each school been calculated separately, and then the total percentages given. A cross descriptive table used to describe the positive response of the students in each school, enabling comparative results to show between the schools; to compare the findings of the physical survey, and the observation with the students' questionnaire in the analysis chapter.

The questions were constructed on the outcomes of the physical survey and the observation factors. The questions evaluate first the student's views about the quality of the physical environment, second the quality of their communication and interaction and third the overall views of their school environment at the end of the questionnaire form.

First: The quality of their physical environment factors

The student's point of view was very important to the research findings, showing the variation in each school with regards of the quality of the physical environment. The results of student's response for their classroom environment quality are summarised in Table 19.

Table 19. Students' responses to the quality of their classroom environment.

		School 1	School 2	School 3	School 4	School 5	Total
Q1- My classroom size is appropriate	Yes	62.90%	46.90%	57.10%	84.10%	59.70%	63.00%
	No	37.10%	53.10%	42.90%	15.90%	40.30%	37.00%
Q2- I like my classroom colour.	Yes	44.40%	23.70%	36.10%	52.40%	49.70%	42.00%
	No	55.60%	76.30%	63.90%	47.60%	50.30%	58.00%
Q3- Our seating arrangement is good and keeps me interacting easily with the teachers.	Yes	43.20%	39.80%	38.80%	47.60%	73.00%	50.20%
	No	56.80%	60.20%	61.20%	52.40%	27.00%	49.80%
Q4- I have good natural lighting in my classroom.	Yes	52.80%	45.80%	66.90%	69.40%	80.50%	66.90%
	No	47.20%	54.20%	33.10%	30.60%	19.50%	33.10%
Q5- My classroom lighting is good.	Yes	54.10%	49.50%	72.70%	80.70%	81.80%	72.10%
	No	45.90%	50.50%	27.30%	19.30%	18.20%	27.90%
Q6- There is no noise in my classroom.	Yes	45.90%	49.00%	31.40%	41.70%	58.60%	44.60%
	No	54.10%	51.00%	68.60%	58.30%	41.40%	55.40%
Q7- The classroom temperature is good.	Yes	50.00%	55.70%	40.70%	47.90%	76.60%	54.70%
	No	50.00%	44.30%	59.30%	52.10%	23.40%	45.30%
Q8- My classroom has fresh air.	Yes	56.8%	43.2%	49.1%	63.9%	62.0%	55.6%
	No	43.2%	56.8%	50.9%	36.1%	38.0%	44.4%

		School 1	School 2	School 3	School 4	School 5	
Q9- There are enough lockers in my school.	Yes	38.9%	23.2%	25.3%	24.1%	47.5%	31.3%
	No	61.1%	76.8%	74.7%	75.9%	52.5%	68.7%
Q10- My classroom is clean and tidy.	Yes	64.9%	32.7%	24.0%	43.8%	88.6%	49.5%
	No	35.1%	67.3%	76.0%	56.3%	11.4%	50.5%
		School 1	School 2	School 3	School 4	School 5	

Question 1 asked students about the size of their classrooms, 63% of the all the student's response confirmed the classroom size is good. **School 4** has the highest positive response of 84 % for classroom size. **Schools 1, 3** and **5** had the same ratio of positive response between 57 – 62 %. While, in **School 2** the negative response to the class size was 53% which is higher than other schools studied.

Question 2 examines the student's concern about classroom colours; over half of all students reported that they were not happy with the classroom colours. **School 2** had the lowest positive response only 23%. **School 3 and 4** has between 36 - 44% of positive feedback. **School 5** has equal between positive and negative response. **School 4** had the best response of 52% of students happy with the classroom colours.

Question 3 asked students about the quality of seating arrangement; the total response of the five schools was equal. **School 5** has just the highest positive response of 73% students responded as good. **Schools 1, 2, 3** and **4** showed that negative responses were higher, between 52 and 61%, showing that the students in these schools felt negatively about their seating arrangement.

Question 4 aimed to ask the students how satisfactory was the natural lighting (daylight) inside their classrooms; 66% of the total responses were positive. **School 5** has highest positive response of 80%, followed by **School 3** and **4** between 66-69 %, and **School 1** has 52% positive feedback. However, 54% of students in **School 2** gave a negative response.

Question 5 asked students about the lighting condition in their classrooms, the finding was compliant with question 4. 72% of the students reported that the lighting conditions inside classrooms is good. **School 3, 4** and **5** had the highest positive response between 70-81%

agreeing that the lighting is appropriate. **School 1** and **2** has equal to low positive responses between 47 and 54%.

Question 6 assessed the student's views about the acoustic condition in their classrooms, 55% of the students agreed that there was noise in their classroom. **School 5** response was the opposite of total sample, as 58% of students said there was no noise in their classroom. While in the other schools, the negative response were higher between 51-68%, which means that their classrooms have disruptive noise.

Question 7 asked students about the thermal quality inside the classrooms; 54% of the total sample were happy with the classroom temperature. **School 5** has the highest positive response of 76%. **Schools 1** and **2** had equal responses between 50-55% to positive responses. While the negative response in **School 3 and 4** has between 52 and 59%, the thermal quality was not appropriate and not suitable for the students.

Question 8 asked about fresh air in the classroom, 55% gave a positive response to the fresh air inside of the classroom. **School 1**, **4** and **5** had the higher positive percentage between 56-63% that shows these schools are better in regards of the fresh air. While the other Schools (2, 3) had a negative response as students had poor fresh air circulating in the classroom.

Question 9 asked about student's availability of lockers in their classroom. 68% of the students said there were not lockers. All the five school gave a negative response on locker availability. Most of the Schools response were between 61-76 %; While in **School 5**, only 52% of the students said lack of lockers was a problem.

Question 10 examines the students' views about the cleanliness of their classrooms. **School 5** had the highest satisfaction of positive response of 88% and 64% in **School 1**. While the other three schools said the cleanliness was not appropriate, demonstrating that these school were not clean enough.

<u>Second</u>: The quality of the student's communication and interaction to their school environment and classrooms.

The students' response about the quality of communication in the school and the facilities provided in their classroom is shown in Table 20.

Table 20. The quality of the interaction and communication of students.

		School 1	School 2	School 3	School 4	School 5	Total
Q11- I knew all parts of my school.	Yes	70.3%	60.8%	68.6%	78.3%	78.2%	72.2%
	No	29.7%	39.2%	31.4%	21.7%	21.8%	27.8%
Q12- Access to the Library and school facilities is easy.	Yes	59.5%	27.7%	63.7%	38.7%	85.4%	57.6%
	No	40.5%	72.3%	36.3%	61.3%	14.6%	42.4%
Q13- My classroom has a computer and a projector.	Yes	32.4%	27.7%	48.5%	81.1%	92.5%	63.7%
	No	67.6%	72.3%	51.5%	18.9%	7.5%	36.3%
Q14- I can change my classroom seating arrangement	Yes	32.4%	28.0%	25.4%	26.2%	59.5%	35.4%
	No	67.6%	72.0%	74.6%	73.8%	40.5%	64.6%
		School 1	School 2	School 3	School 4	School 5	

Question 11 aimed to discover the student's awareness of their school building; the majority of the students knew their school well. Students in the five schools had positive response between 60 and 78 %. The highest percentage was for **School 4** and **5;** one of these schools has dedicated classrooms for each subject, between which students have to walk frequently. Whereas, the second school has variety of social areas and zones for students.

Question 12 asked about the access to the library and school facility, the total response was positive at 57 %. **School 5** has the top positive percentage of 85% then **School 1** and **3** had 59 -63%. However, in **Schools 2** and **4** the response was more negative: 61 to 72% of the students were not happy.

Question 13 assesses the student's response to the teaching aids and technology that are provided in the classroom. **Schools 5** and **4** had significant positive responses between 81 and 92%. But the other three schools the negative response was higher between 51-72%, expressing dissatisfaction with the classroom facilities.

Question 14 aimed to access the student's ability to change their seating arrangements. The majority of student's s gave a negative response in **Schools 1, 2, 3** and **4** between 67 and 74%,

demonstrating they were not able to change their place in the classroom. **School 5** was different to the others, 59% of the students' responses show that students in this school were able to change their position in the classroom.

Third: **The general views of the school and classrooms environment and the feedback suggested by students.**

This category is discussed in two parts; the first part is the qualitative part about the student's general view and concerns about the school and classroom (see Table 21). The second part is the quantitative data gathered from the student's comments and suggestions in the questionnaires (see Table 22).

Quantitative part:

Table 21. The student's views of their school and classrooms environment

		School 1	School 2	School 3	School 4	School 5	Total
Q15- I like my school.	Yes	83.3%	67.3%	52.4%	69.2%	89.9%	70.4%
	No	16.7%	32.7%	47.6%	30.8%	10.1%	29.6%
Q16- I like to come to School every day.	Yes	66.7%	49.5%	37.6%	51.0%	79.7%	55.4%
	No	33.3%	50.5%	62.4%	49.0%	20.3%	44.6%
Q17- My classroom is in good condition.	Yes	59.5%	47.9%	45.8%	69.9%	81.8%	62.2%
	No	40.5%	52.1%	54.2%	30.1%	18.2%	37.8%
Q18- My classroom is comfortable.	Yes	45.9%	44.8%	43.8%	50.3%	72.4%	53.1%
	No	54.1%	55.2%	56.2%	49.7%	27.6%	46.9%
Q19- My classroom seat are comfortable.	Yes	38.9%	33.7%	32.7%	48.3%	56.3%	43.1%
	No	61.1%	66.3%	67.3%	51.7%	43.7%	56.9%
		School 1	**School 2**	**School 3**	**School 4**	**School 5**	

Five questions were asked about the classroom environment; question 15 asks to what extent the students like their schools. The majority of the students are positive about their schools. **School 1** and **5** had 83% of positive response. **School 2** and **4** had between 67-69% positive responses. But in **School 3** the responses were quite equal.

Question 16 examined students' desire to go to school; this question was linked to Question 15 illustrating the difference between the students behavioural feeling and the action undertaken. 55% of the total sample gave positive responses, while the negative response was 45%; meaning around half of the students did not want to go to school. **School 1** and **5** had between 66 and 79% positive responses.

Question 17 asked about the condition of the classroom; more than half of the total sample responses were positive. **School 5** has the highest positive responses of 81%, followed by **School 4** and **1** between 59 - 69%. The negative responses were higher in **School 2** and **3** between 52-54%.

Question 18 assessed the student's reaction as to how comfortable the classrooms are in general, there was little difference between the positive and negative responses. **School 5** had the most positive response at 72%. The negative responses in other schools were average between 49 - 56%, this indicate these means students were uncomfortable with their classroom.

Question 19 asked the students about how comfortable the classroom furniture was, an average of 56% negative response were recorded in total sample. **Schools 1, 2**, and **3** had the highest negative response between 61- 66%. In **School 4** and **5** the positive response was between 48-56%.

Qualitative part:

The comments and suggestions raised by the students in terms of their learning environment varied in each school. The students wrote their suggestions without any direction or pressure, there were general concerns about the school environment and teaching quality. The sample of these comments was limited, not many students raised their concerns in the questionnaire. Up to 41 students only involved in this part from the whole 613 students. These suggestions and concerns were written in different styles by the students, but the relevant points were categorised, while the non-relevant concerns were ignored. These categorises are shown in Table 22 and illustrated below.

Table 22. Student's suggestions

Suggestion Set	School 1	School 2	School 3	School 4	School 5	Total
1- Using technology in teaching (IPads- computers- Projector – Smart board)		8	29	2	2	41
		19.5%	70.7%	4.9%	4.9%	
2- Improve the quality of classroom furniture		12	11	7	3	33
		36.4%	33.3%	21.2%	9.1%	
3- Organise the classroom well (Colour – Noise- lighting - Odour)	1	9	7	11	2	30
	3.30%	30.0%	23.3%	36.70%	6.70%	
4- Clean and tidy toilets and classroom		4	14	6		24
		16.7%	58.3%	25.0%		
5- Provide lockers in the classroom.		3	5	13		21
		14.3%	23.8%	61.9%		
6- Attractive school and classroom (bigger size- Aesthetic design)			5	4	1	10
			50.0%	40.0%	10.0%	
	School 1	School 2	School 3	School 4	School 5	

Set 1: 41 students from **School 1, 2, 3** and **4** suggest using technology in teaching. Providing an iPads, smart board, projectors and computers were the students' concerns to improve the learning and teaching quality.

Set 2: 33 students from **School 1, 2, 3** and **4** requested improvements in the current classroom furniture quality.

Set 3: 30 students from all schools asked to improve the overall quality of the classroom environment, like colour, noise, lighting and ventilation.

Set 4: 24 students from **School 2, 3** and **4** commented on the condition of their classroom and school facility.

Set 5: 21 students from **School 2, 3** and **4** requested to provide lockers for each student in the classroom or school.

Set 6: 10 students from **School 3, 4** and **5** suggest developing the classroom design in term of the size and aesthetics.

Teachers' questionnaire

The teacher's feedback to the learning environment has a different perspective to the students. The questionnaire asked 40 questions (see Appendix F) about their opinions of the rules in the schools, the quality of the learning environment, and then their comments and suggestion were at the end. The Likert scale was used in this model to measure the attitudes of the teachers *(Robson, 2011)*. Four ratings scales were used in this questionnaire: poor, satisfied, good and very good.

The sample was a random selected of 162 teachers in different subject areas, from the five schools. For the purpose of the research, reporting structure of these data is similar to the students' questionnaire; each question illustrated in cross-tabs report style. The questions focused on the three categories in the learning environment. First is the quality of the physical environment, second is their interaction in the classroom environment and third is the teacher's suggestions and concerns.

 <u>First</u>: **Teachers concerns about the physical environment:** 8 questions were asked about the quality of the physical environment. The overall response to these questions was very positive. For the purpose of the research, a comparison is made between the results from each school. This will be important as it shows the variations of the teacher's attitude and performance in each school.

Table 23 shows the teachers response regarding the classroom size. Indicating the majority of teachers were happy with the space provided. The 'poor' and 'satisfied' responses were few from **School 2, 3 and 4,** while in **school 5** 47% of the teachers responded with ratings of poor and satisfied with the spaces of the classroom.

Table 23. Teachers' response to Q1

		School 1	School 2	School 3	School 4	School 5	Total
There is adequate space for movement in the classroom.	Poor		2.9%		3.4%	21.1%	4.3%
	Satisfied		11.8%	8.3%	3.4%	26.3%	8.0%
	Good	42.3%	52.9%	37.5%	42.4%	15.8%	40.7%
	very Good	57.7%	32.4%	54.2%	50.8%	36.8%	46.9%
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 24 shows the teacher's response to the seating arrangements in the classroom. The average total responses were good or very good in all schools. 15% of **School 5** teachers gave the 'poor' response to the seating arrangement, with some teachers felt the seating arrangement is not effective while other feels is effective. **Schools 2, 3** and **4** offered 'poor' and 'satisfied' responses between 3 and 29%. In **School 1,** the teachers believe the seating arrangement is effective with 95% of the responses positive.

Table 24 Teachers' response to Q2

		School 1	School 2	School 3	School 4	School 5	Total
Furniture arrangement is effective such that it allows the performance of different activities in the classroom.	Poor		5.9%	4.2%	3.4%	15.8%	4.9%
	Satisfied	3.8%	29.4%	8.3%	20.3%	10.5%	16.7%
	Good	34.6%	55.9%	41.7%	42.4%	21.1%	41.4%
	very Good	61.5%	8.8%	45.8%	33.9%	52.6%	37.0%
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

In Table 25, teachers indicated that the classroom furniture is good and appropriate for learning; 82% of the five schools reported the furniture is good and very good. The total satisfied response was 12% in **Schools 1, 2, 3** and **4**. A small minority 4.3% of teachers from **Schools 2**, **4** and **5** viewed the furniture quality as poor.

Table 25. Teachers' response to Q3

		School 1	School 2	School 3	School 4	School 5	Total
Furniture is suitable and well-maintained.	Poor		5.3%		6.8%	5.3%	4.3%
	Satisfied	4.0%	18.4%	17.4%	15.3%		12.8%
	Good	48.0%	50.0%	39.1%	52.5%	21.1%	45.7%
	very Good	48.0%	26.3%	43.5%	25.4%	73.7%	37.2%
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

In Table 26, teacher's response about the student's density in the classrooms was positive. The positive response of good and very good scale was higher from **Schools 1**, **2, 3** and **4**. While the poor and satisfied response has around 20% of the total; School 5 has 27% of satisfied response.

Table 26. Teachers' response to Q4

		School 1	School 2	School 3	School 4	School 5	Total
The classroom density is good, and there are no overcrowding which supports teachers to control their classrooms	Poor		2.5%	4.2%	10.2%	5.6%	5.4%
	Satisfied	11.5%	5.0%	16.7%	18.6%	27.8%	15.0%
	Good	50.0%	37.5%	41.7%	27.1%	44.4%	37.1%
	very Good	38.5%	55.0%	37.5%	44.1%	22.2%	42.5%
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

In Table 27, teachers were asked to indicate whether the classroom lighting was adequate and work effectively; most of the responses were positive. **School 1** and **2** has between 50% good lighting, followed with **Schools 3, 4** and **5** which have between 60-73% very good lighting condition. The responses of poor and satisfied were in total around 14% and were from **Schools 2, 3** and **4**.

Table 27. Teachers' response to Q5

		School 1	School 2	School 3	School 4	School 5	Total
Lighting is adequate and there is no glare in our classrooms.	Poor		5.1%	4.2%	6.9%		4.2%
	Satisfied	7.7%	17.9%	8.3%	8.6%		9.6%
	Good	50.0%	53.8%	25.0%	25.9%	26.3%	36.1%
	very Good	42.3%	23.1%	62.5%	58.6%	73.7%	50.0%
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

In response to the classroom temperature as shown in Table 28; most of those surveyed indicated that they were happy with their classroom temperature. Teacher's responses were positive which reveals there have no issue with classroom temperature. Good and very good scales have the largest response of 75% in total. The poor and satisfied scales had small responses between 6 – 18 %.

Table 28. Teachers' response to Q6

		School 1	School 2	School 3	School 4	School 5	Total
Teachers are satisfied with classroom temperature.	Poor		5.3%	8.7%	12.1%		6.7%
	Satisfied	3.8%	23.7%	21.7%	22.4%	10.5%	18.3%
	Good	53.8%	44.7%	34.8%	48.3%	52.6%	47.0%
	very Good	42.3%	26.3%	34.8%	17.2%	36.8%	28.0%
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 29 shows the teacher's response about the quality of acoustic condition, 81% of the total sample indicating that the external noise is controlled, and not affecting their performance. **School 3** had the highest positive response of 66% for very good scale; other schools has between 37- 48%. The negative responses for both of poor and satisfied response were between 5 -12 % from all schools, **Schools 3** and **5** had between 8 and 10% ratings of 'poor'.

Table 29. Teachers' response to Q7

		School 1	School 2	School 3	School 4	School 5	Total
External noise is minimised in our classrooms.	Poor		5.0%	8.3%	5.2%	10.5%	5.4%
	Satisfied	15.4%	12.5%	16.7%	13.8%		12.6%
	Good	38.5%	45.0%	8.3%	32.8%	42.1%	34.1%
	very Good	46.2%	37.5%	66.7%	48.3%	47.4%	47.9%
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

The teachers were asked about the locker availability for students as shown in Table 30; the majority commented that students have the appropriate lockers. This results contrasts with the students' views. **Schools 1**, **3** and **5** had the highest very good responses between 45-57%, and the good response was varied between 25- 52%. The 'poor' rating was 10% from **Schools 2**, **3**, **4** and **5** indicated that students do not have enough lockers in their school.

Table 30. Teachers' response to Q8

		School 1	School 2	School 3	School 4	School 5	Total
There is appropriate lockers for students' belongings.	Poor		10.0%	16.7%	15.5%	5.3%	10.9%
	Satisfied	8.3%	17.5%	12.5%	19.0%	5.3%	14.5%
	Good	37.5%	52.5%	25.0%	41.4%	31.6%	40.0%
	very Good	54.2%	20.0%	45.8%	24.1%	57.9%	34.5%
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 31 shows the teachers response about the availability of personal workplace and lockers in their school; most gave a positive response. The responses in all five schools were usually in positive side between 50-80% in total of 'good' and 'very good'. Small 'poor' responses were reported of 4% from **Schools 2, 3, 4**, and **5**.

Table 31. Teachers' response to Q9

		School 1	School 2	School 3	School 4	School 5	Total
Teachers have adequate personal workplace and storage.	Poor		5.1%	4.2%	5.1%	5.3%	4.2%
	Satisfied	7.7%	12.8%	12.5%	11.9%	10.5%	11.4%
	Good	53.8%	59.0%	29.2%	37.3%	26.3%	42.5%
	very Good	38.5%	23.1%	54.2%	45.8%	57.9%	41.9%
		100.0%	10`0.0%	100.0%	100.0%	100.0%	100.0%

Second: **The quality of communication and interaction in the classroom:** This category discusses the teachers understanding and concern about the function of the classroom and how it impacts on the teaching and learning performance.

In Table 32, the vast majority of teachers reported that they were familiar with the classrooms function. The total percentage for 'good' and 'very good' was 92% positive responses. The teachers' responses indicated that they are aware of the importance of the learning environment, and ways to organise it to support teaching and learning performance. The 'poor' response showed a small percentage of 1.7% in **School 4**.

Table 32 . Teacher's response to Q10

		School 1	School 2	School 3	School 4	School 5	Total
Teachers know the function of the classroom	Poor				1.7%		0.6%
	Satisfied	12.5%	5.0%		10.3%		6.7%
	Good	20.8%	40.0%	37.5%	29.3%	36.8%	32.7%
	very Good	66.7%	55.0%	62.5%	58.6%	63.2%	60.0%
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

The teachers were asked about their role in enhancing the effective learning environment as shown in Table 33; 97% of the total sample showed they support that. The teachers' responses in five schools were equal in the positive scale. While the 'poor' and 'satisfied' scale was in small percentage less than 1%. These figures indicate the teachers' demands on developing the learning environment was high.

Table 33. Teachers' response to Q11

		School 1	School 2	School 3	School 4	School 5	Total
Teachers support the developing of the learning environment.	Poor				1.7%		0.6%
	Satisfied	4.0%	2.6%	4.2%	3.4%		3.0%
	Good	48.0%	33.3%	25.0%	33.9%	47.4%	36.1%
	very Good	48.0%	64.1%	70.8%	61.0%	52.6%	60.2%
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

The question that examined the teachers view about the availability of space for displaying students' work inside the classrooms. The variations in the figures are shown in Table 34. The majority responses were positive at 70% in the five schools. The 'poor' response was between 3- 21% from **Schools 2, 3, 4,** and **5**. These show the majority of teachers sees that there are spaces for student's work, while a small number had the opposite view.

Table 34. Teachers' response to Q12

		School 1	School 2	School 3	School 4	School 5	Total
The classroom has space for students' work to display.	Poor		12.5%	21.7%	3.4%	11.1%	8.5%
	Satisfied	12.0%	25.0%	8.7%	28.8%	33.3%	23.0%
	Good	52.0%	42.5%	34.8%	37.3%	27.8%	39.4%
	very Good	36.0%	20.0%	34.8%	30.5%	27.8%	29.1%
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 35 shows the teachers' views about the quality of the teaching provision and facilities in the classrooms; 85% of the responses were positive. The qualities of the teaching facility provided varied between each school. **School 5** had the vast positive response of 95%, the classrooms in this school have computer and projectors as shown in physical survey. Additionally, the whole sample in **School 1** had positive response. This shows teachers in these two schools were happy with the facilities provided. The 'poor' responses were 5% in total from **Schools 4, 5**, and **2**.

Table 35. Teachers' response to Q13

		School 1	School 2	School 3	School 4	School 5	Total
Educational equipment is clearly labelled and is easily accessible in classrooms.	Poor		12.1%		5.2%	5.3%	5.0%
	Satisfied		18.2%	25.0%	5.2%		9.4%
	Good	38.5%	39.4%	16.7%	22.4%		25.0%
	very Good	61.5%	30.3%	58.3%	67.2%	94.7%	60.6%
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Teachers were asked about the encouragement given to the students to change and develop their learning environment as shown in Table 36; 90% of the total samples were supportive. Almost all schools' responses were 'good' or 'very good'. These figures reveal that the teachers consider they support their students to personalise and improve the classroom. **School 1, 3**and **4** has only small 'poor' responses less than 2%.

Table 36. Teachers' response to Q14

		School 1	School 2	School 3	School 4	School 5	Total
Teachers encourage student to personalise and develop their learning environment.	Poor	4.0%		4.2%	1.7%		1.8%
	Satisfied	8.0%	10.0%	4.2%	8.5%		7.2%
	Good	60.0%	40.0%	50.0%	40.7%	42.1%	44.9%
	very Good	28.0%	50.0%	41.7%	49.2%	57.9%	46.1%
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 37 shows there are 82% of the teachers from these schools agreed that they had the authority to change the classrooms arrangements. The 'poor' responses were between 3 – 11 % from all schools. Students were asked if they able to change the classroom arrangement also (see Table 20); their response were mostly negative. The teachers also asked the same question as shown in Table 38; most of the teachers stated that students have that ability to change the classroom settings. Whereas around 4 - 16% of the teachers in each school excluding **School 3** indicated this was not possible. These figures strongly show the different perspectives of the teachers and student's responses to same question.

Table 37. Teacher's response to Q15

		School 1	School 2	School 3	School 4	School 5	Total
Teachers have the authority to change the arrangement of the classrooms.	Poor	11.5%	5.0%	4.2%	3.4%	11.1%	6.0%
	Satisfied	11.5%	15.0%	8.3%	10.3%	11.1%	11.4%
	Good	42.3%	27.5%	62.5%	39.7%	22.2%	38.6%
	very Good	34.6%	52.5%	25.0%	46.6%	55.6%	44.0%
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 38. Teacher's response to Q16

		School 1	School 2	School 3	School 4	School 5	Total
Students are allowed to make changes in the classroom arrangement.	Poor	4.0%	5.0%		16.9%	16.7%	9.7%
	Satisfied	12.0%	22.5%	21.7%	22.0%		18.2%
	Good	32.0%	47.5%	34.8%	35.6%	38.9%	38.2%
	very Good	52.0%	25.0%	43.5%	25.4%	44.4%	33.9%
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

The last question in this category as shown in Table 39 asked teachers if the organisation of the classroom are based on the teaching strategy. 88% of the total teachers responded positively. Whereas a small percentage from **Schools 4** of teachers gave 'poor' response. This figure shows teachers were aware of the importance of teaching environment.

Table 39. Teacher's response to Q17

		School 1	School 2	School 3	School 4	School 5	
The classroom arrangement depends on teaching strategy.	Poor				3.4%		1.2%
	Satisfied	3.8%	12.5%	8.3%	5.1%	16.7%	8.4%
	Good	34.6%	47.5%	41.7%	33.9%	27.8%	37.7%
	very Good	61.5%	40.0%	50.0%	57.6%	55.6%	52.7%
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Third: **The teacher's suggestions and concerns**: This section considers the teacher's general views of the school and classroom environment, and also identifies their concerns for improving the standards of the learning environment. This category is divided into two parts; the first to be considered is the teacher's general feedback. The second part is the comments and suggestions collected from the teacher's questionnaire.

Teachers' views about the classroom as a pleasant place to teach were positive; 83% of the teachers answered 'good' and 'very good' from all schools. Small levels of 'satisfied' with the space they have were recorded. Only 3 - 8% from **School 2, 3** and **4** considered the classroom space to be in need of attention (See Table 40).

Table 40. Teacher's response to Q18

		School 1	School 2	School 3	School 4	School 5	Total
Classrooms are pleasant places to teach.	Poor		7.7%	8.3%	3.4%		4.2%
	Satisfied	4.0%	20.5%	12.5%	11.9%	5.3%	12.0%
	Good	64.0%	46.2%	41.7%	32.2%	42.1%	42.8%
	very Good	32.0%	25.6%	37.5%	52.5%	52.6%	41.0%
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

In regards to the overall classroom atmosphere and decoration quality, Table 41 shows around 78% of the total responses were positive. 15% were satisfied, whereas a small proportion of the responses were recorded as 'poor' from **Schools 2, 3** and **5**.

Table 41. Teachers' response to Q19

		School 1	School 2	School 3	School 4	School 5	Total
The Classroom interior and exterior decoration are good.	Poor		5.0%		13.8%	5.3%	6.6%
	Satisfied		27.5%	8.3%	17.2%	10.5%	15.0%
	Good	34.6%	35.0%	37.5%	43.1%	36.8%	38.3%
	very Good	65.4%	32.5%	54.2%	25.9%	47.4%	40.1%
Total		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Two questions were asked about the support given to teachers from the school administrators and the Ministry of Education to improve the quality of learning environment (see Table 42). The overall response to these questions was very positive; more than 80% of 'good' and 'very good' responses were recorded from each school. It means the teachers were encouraged to improve the physical learning environment in their schools. However, there was a small minority who gave a negative response to the first question, up to 4 % for **Schools 2, 3** and **4**. In question two, **Schools 4** and **5** had 11 to 21% of 'poor' as a response. These reveal that teachers believe the school administrators gave more support to improve the classroom environment than the educational authority.

Table 42. Teachers' response to Q20

		School 1	School 2	School 3	School 4	School 5	Total
School administrators encourage and support teachers to pay attention to their learning environment.	Poor		2.5%	4.3%	1.7%		1.8%
	Satisfied		15.0%	4.3%	1.7%	5.3%	5.4%
	Good	38.5%	35.0%	34.8%	15.3%	21.1%	26.9%
	very Good	61.5%	47.5%	56.5%	81.4%	73.7%	65.9%
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		School 1	School 2	School 3	School 4	School 5	Total
The educational authority paying attention to the quality of the learning environment.	Poor				11.9%	21.1%	6.6%
	Satisfied	7.7%	12.8%	4.3%	22.0%		12.7%
	Good	50.0%	33.3%	39.1%	37.3%	36.8%	38.6%
	very Good	42.3%	53.8%	56.5%	28.8%	42.1%	42.2%
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Teachers' suggestions

The number of the comments and feedback suggestions from the teachers was few, as this section was not compulsory. The comments that relate to the learning environment were gathered, while the non-relevant comments were ignored. Teachers suggested that to improve quality of the classroom environment and indicated:

- The classroom size is small and the position and size of the whiteboard is not correct which need to be larger (**Schools 3** and **5**).
- Bigger classrooms in the future would reduce the overcrowding of students (**Schools 3, 4** and **5**).
- Improving the classroom colours like the green colour can enhance students thinking, and encourage creativity (**Schools 3, 4** and **5**).
- Regular maintenance and renovation of the learning environment are important for effective teaching (**School 3** and **5**).
- Providing more technological facilities for teaching is important, like projectors, computers, iPads, smart boards and speakers (**Schools 2, 4** and **5**).
- Controlling the natural lighting in the classroom would be beneficial (e.g. providing blinds) (School **4**).
- Providing lockers for the students and teachers would be helpful (**School 4**).

Administrators' questionnaire

This questionnaire was directed to the school administrators, who are responsible for the maintenance and management of the building. It aimed to represent their general considerations and concerns about the school environment. The questionnaire consisted of 26 questions that follows different scales: multiple choice questions and a comments space at end of each question (see Appendix G).

Similar to students' and teachers' questionnaires, particular questions were selected to obtain the opinion of the school administrators. Because there was only a small sample of the administrators to answer the questionnaire, a sample was expanded to 18 intermediate male schools in Kuwait. Frequencies statistic description used to present these data; for ethical considerations, the school identification numbers were hidden to keep personal data secret.

The response percentage calculated represented 3% of the total number of intermediate schools in Kuwait.

The first two questions were about the age of the school building and when the refurbishment was undertaken in the school (See Table 43). The majority of the schools are between 30 and 50 years old. Five schools were built between 10- 30 years ago, and three schools were built within the last 10 years.

Table 43. School administrators' responses to Q1 and Q2

When was your school built?	Frequency	Percent
40-49 Years Old	4	22.2
30-39 Years Old	6	33.3
20-29 Years Old	3	16.7
10-19 Years Old	2	11.1
Under 10 Years Old	3	16.7
Total	18	100.0
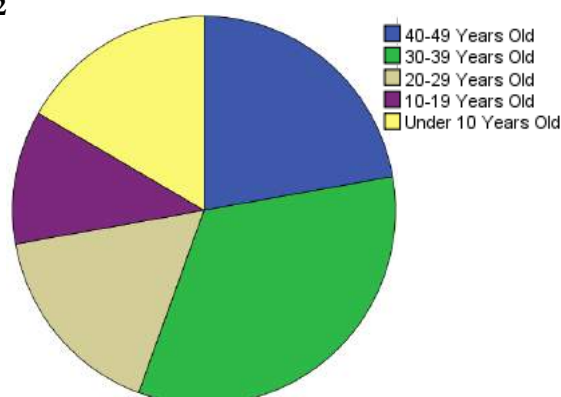
In table 44, there are 73% of the school administrators mentioned that their school was refurbished within the last five years. 20% of the responses indicated the schools were refurbished within the last 10 years. While just two schools that have been refurbished recently. These shows the majority of the schools were refurbished in recent times.

Table 44. School administrator's responses to Q3

When was your school last upgraded or refurbished?		Frequency	Valid Percent
	Before 15 Years	1	6.7
	Before 10 Years	3	20.0
	Before 5 years	9	60.0
	Less than a year	2	13.3
	Total	15	100.0
Missing	System	3	
Total		18	

With regards to the colours used in teaching area as shown in Table 45, the majority of the school administrators preferred to choose light colours. Few of them preferred a white colour in the learning environment.

Table 45. School administrators' responses to Q4

What colour are the walls in the teaching areas?		Frequency	Percent	Valid Percent
	Dark	0	0	0
	White	3	16.7	17.6
	Light colours	14	77.8	82.4
	Total	17	94.4	100.0
Missing	System	1	5.6	
Total		18	100.0	

Table 46 shows the two questions that examined the artificial lighting and daylight conditions in the classrooms. 94% responses reported there is fluorescent lighting in the classroom; just one response mentioned the classroom had incandescent lighting. 88% of the school administrators claimed that the classroom windows were large enough for appropriate natural light. One comment emphasised that although the windows size was big enough, its position provided less natural lighting.

Table 46. School administrators' responses to Q5 and Q6

What type of lighting is installed in the classroom areas?		Frequency	Valid Percent
	Incandescent Lighting	1	5.9
	Fluorescent Lighting	16	94.1
	Total	17	100.0
Missing	System	1	
Total		18	
Q6- What is the size of windows in each classroom?		Frequency	Valid Percent
	It's large enough and gives natural light for the school.	16	88.9
	Small size and gives little light into classroom	1	5.6
	It's too small and not giving enough light.	1	5.6
	Total	18	100.0

The school administrators' responses to the seating arrangement indicated that 72% offered a rows arrangement, 22% were cluster arrangement (see Table 47). Just one response claimed that school seating was arranged as cooperative groups. Seating in rows was popular in the all the schools in this investigation.

Table 47. School administrators' responses to Q7

Which type of seating arrangement is usually used in classrooms?	Frequency	Percent
Row seating arrangement.	13	72.2
Clusters seating arrangement.	4	22.2
Cooperative arrangement	1	5.6
Total	18	100.0
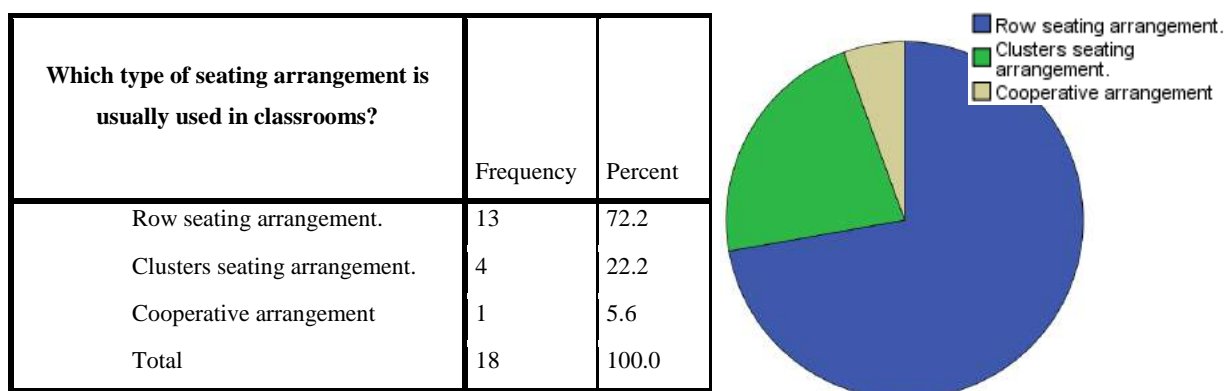
Table 48 shows that the administrators were asked about the condition of the lockers units in their schools; 70% of the administrators stated that the lockers are out of order and not functional. The bad quality of the lockers was mentioned by one participant. These figures correspond with the student's questionnaire finding that mentioned earlier. However, 23% of the administrators were positive that the lockers were good.

Table 48. School administrators' responses to Q8

What is the condition of the lockers?		Frequency	Valid Percent
	Most are not functional and need repair.	12	70.6
	Most of the lockers are functional and in good repair.	4	23.5
	No lockers were provided	1	5.9
	Total	17	100.0
Missing	System	1	
Total		18	

The administrators were asked if the noise in the classrooms coming from the outside of the school as shown in Table 49; 81% stated that their schools have no noise problem. Just three

schools indicate that there is noise in the school and just one of the school administrators said action had been undertaken to reduce noise levels. In addition, comments were added about the noise in schools that caused by the location: a lot of traffic during the school time and that increases the noise level.

Table 49. School administrators' responses to Q9

Is the school located near loud noise producing environment?		Frequency	Percent	Valid Percent
	Yes, action not taken to reduce the level of noise within the school.	2	11.1	12.5
	Yes, but measures have been taken to reduce the level of noise within the facility.	1	5.6	6.3
	No noise in school	13	72.2	81.3
	Total	16	88.9	100.0
Missing	System	2	11.1	
Total		18	100.0	

Table 50 shows the school administrators response about the flooring and ceiling materials used in the classroom. Majority of schools have solid ceramic or mosaic terrazzo tiles, and just one school has carpet flooring. 14 schools had concrete ceilings, and three have plaster or acoustical tiles. The floor and ceiling material affects the noise level in the classroom, since solid materials do not absorb noise and increase echo.

Table 50. School administrators' responses to Q10

What kind of flooring in the majority of the classrooms?		Frequency	Valid Percent
	Tile or Terrazzo	17	94.4
	Carpet	1	5.6
	Total	18	100.0
What type of material is used for classroom ceilings?		Frequency	Valid Percent
	Plaster or acoustical tiles	3	17.6
	Concrete	14	82.4
	Total	17	100.0
Missing	System	1	
Total		18	

The thermal quality in the classrooms was mentioned earlier within the physical survey and student's questionnaire; all schools were provided with air conditioning. Administrators were asked if there was a thermostatic temperature controller in each classroom (see Table 51); most schools administrators responded negatively. Just one school gave positive response, and added that the central air-conditioning could be controlled in each classroom. Other comments said that the air-conditioning was not working well and required maintenance.

Table 51. School administrators' responses to Q11

Do the majority of classrooms have individual heat control?		Frequency	Percent	Valid Percent
	Yes	1	5.6	5.6
	No	17	94.4	94.4
	Total	18	100.0	100.0

Some of the student responses mentioned the cleanliness of the classroom was not appropriate, this question was asked to the school administrators also (see Table 52). The majority of the responses claimed that schools were cleaned and vacuumed on a daily bases, a small minority revealed that the classrooms were only cleaned on a weekly basis.

Table 52. School administrators' responses to Q12

How often are the classroom areas floors cleaned or vacuumed?		Frequency	Valid Percent
	Weekly	4	23.5
	Daily	13	76.5
	Total	17	100.0
Missing	System	1	
Total		18	

Graffiti were observed in some classrooms within the physical survey, the school administrators' responses about graffiti are shown in Table 53. More than the half responses claimed there is no graffiti in the classroom; one comment reported that graffiti is not found in the school due to the school has CCTV. 41% of the responses confirmed there is graffiti in the school. The following question asked how long the graffiti remained in the classroom, 68% of the responses stated that graffiti is removed within a week. Whereas other administrators answered that the graffiti remained more than a week or until the summer maintenance cycle.

Table 53. School administrators' responses to Q13 and Q14

Is graffiti commonly found in classrooms		Frequency	Valid Percent
	Yes	7	41.2
	No	10	58.8
	Total	17	100.0
Missing	System	1	
How long does the graffiti remain before it is removed?			
	Until summer maintenance cycle	2	12.5
	More than a week, less than a month	1	6.3
	Less than a week	11	68.8
	No graffiti there	2	12.5
	Total	16	100.0
Missing	System	2	
Total		18	

Student density in each classroom results are shown in Table 54; 66% of administrators answered that student density is between 15 to 25 per-class. Where 33% of the sample asserted it is over 25 students.

Table 54. School administrators' responses to Q15

What is the maximum student numbers in each classroom?	Frequency	Valid Percent
Over 25 students.	6	33.3
Between 15 to 25 Students.	12	66.7
Total	18	100.0

Table 55 shows the school administrators' response about the quality of the furniture in their schools; 64% of them believed all classroom furniture is good and attractive. 35% of the responses stated that the parts of the furniture were damaged but still functioning.

Table 55. School administrators' responses to Q16

What is the condition of the classroom furniture?		Frequency	Valid Percent
	The furniture is partly damaged but still satisfies to be used.	6	35.3
	All of the classrooms furniture is functionally good and attractive.	11	64.7
	Total	17	100.0
Missing	System	1	
Total		18	

Students' ability to change the setting of the classroom was discussed earlier within the students and teachers questionnaires. School administrators' responses to this issue are shown in Table 56. Around half of the responses acknowledged students are free to change the arrangement and setting of the classroom under permission of the school. Other responses claimed that students need permission to do that. In reply to the second question, 58% of the administrators express that the school usually organises competitions and awards for the best classroom arrangement on a weekly basis. 35% of the administrators stated that if students show their interest to change the classroom setting, the school supports them. The variations of thought mean that the school administrators do not necessarily follow the same rules.

Table 56. School administrators' responses to Q17 and Q18

Do students need permission to change the arrangement of their classroom environment?		Frequency	Valid Percent
	Yes, Teacher, administrators and then the Ministry of Education.	3	17.6
	Yes, permission from their teachers and administrators.	6	35.3
	No, they are free to do that under school Permissions.	8	47.1
	Total	17	100.0
Missing	System	1	
Total		18	
Do you encourage the student to personalise and develop their learning environment?		Frequency	Valid Percent
	No at all.	1	5.9
	Yes, if students express their desire to do.	6	35.3
	Yes, by activities and rewards.	10	58.8
	Total	17	100.0
Missing	System	1	
Total		18	

Yes, Teacher, administrators and then the Ministry of Education.
Yes, permission from their teachers and administrators.
No, they are free to do that under school Permissions..
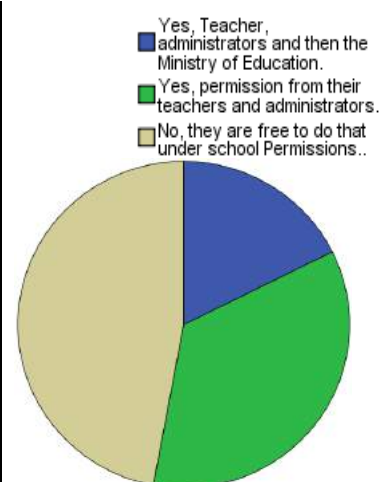
Table 57 shows the administrators response to the efficient function or strategy for the school building, and emphasises that there is a policy clearly written. Half of the response thought the policy was not available or not circulated well to all people in the schools, whereas the other half thought it was.

Table 57. School administrators' responses to Q19

Are there a clear policy for the function and efficient of the school building?		Frequency	Valid Percent
	No	5	29.4
	Yes, these roles are understood and written clearly but not circulated to school users.	6	35.3
	Yes, it's circulated to all users.	6	35.3
	Total	17	100.0
Missing	System	1	
Total		18	

No
Yes, these roles are understood and written clearly but not circulated to school users.
Yes, it's circulated to all users.
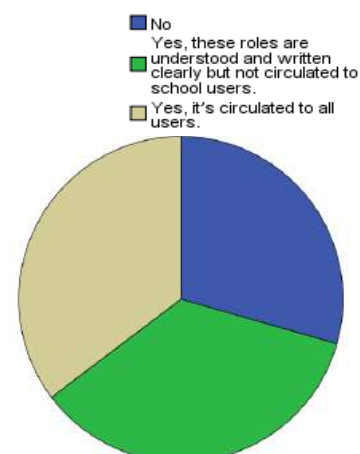
The communication between the educational authority and the school administrators are important, to improve the standards of the learning environment. Table 58 shows more than half of the school administrators claim that the Ministry of Education is not aware of this issue, and does not evaluate the educational building quality. While other administrators see the Ministry of Education as being aware.

Table 58. School administrators' responses to Q20

Is the Ministry of Education aware of the importance of the quality of the physical environment in schools, and does it make periodic physical checks that apply to all public schools?		Frequency	Valid Percent
	Yes	8	47.1
	No	9	52.9
	Total	17	100.0
Missing	System	1	
Total		18	

Summary of the Questionnaires

The above questionaries' outcomes indicated the views of the users and managers of the learning environment including students, teachers and administrators. The students' responses represented their understanding of the learning environment as a space for gaining information. Teachers' responses show their perspective that the learning environment is place for teaching the students and deliver the information. School administrators' responses to the learning environment show their concerns about managing school duties in general including the environment. These responses appear to show less consideration and understanding of the function of the school and classroom environment, which is to enhance the effective learning and teaching quality *(Weinstein and David, 1987).*

Summary of the case studies

As was discussed, the main case studies were purposed to investigate the learning environment features and evaluate the impacts of the exciting classroom environment on the learning and teaching interaction, behaviour and performance. The investigation was based on three criteria for examine the quality of learning environment in Kuwait, which followed the mixed-method approach of data collection. First, to demonstrate and appraise the schools' and classrooms' environment quality by physical survey. Second, to observe the impacts of the physical classroom environment on students and teachers' interaction and performance. Third, to reflect the students', teachers' and school administrators' views and concerns about the schools and classroom environment. The initial outcomes are presented as follows:

- The quality of the school building, age, location and the classroom facilities varies in Kuwait intermediate public schools.
- Less attention has been paid to students' learning efficiency based on classroom design since it was based on direct teaching purposes.
- The physical classroom environment features have different impacts on students and teaching outcomes.
- Students' responses to their classroom environment is influenced positively with the social quality in school building.
- Most of the students' responses concerning their physical environment quality corresponded well to the physical survey and observation outcomes.
- Teachers' responses were mostly positive and yet opposite to the students' responses.
- Administrators' responses indicated the evaluation and measurement of the learning environment was not undertaken in any depth.

6.4 Interview with the official

The outcomes of the case studies indicate the variation of standards in school building quality. Students', teachers' and school administrators' understanding of the classroom environment function were based on teaching purposes. Evaluating the outcome of this study alongside the views and considerations of the officials who are responsible for planning and developing the schools are significant. A semi-structured interview was conducted for this research with the Director of Design and Establishments (DDE[6]) department (Eng. Abdul-Mohsen Sadeq) a position he held for 19 years. The interview was based on an open-ended structure with 10 questions (see the interview transcript in Appendix H). The questions considered three main factors: First the criteria and principles for the school design. Second, the physical classroom layout aspects; these two factors will be discussed in this section. While third factor concerns a discussion about the initial outcomes of the case study, demonstrated in Chapter Eight. The interviewee did not always respond to the questions clearly; this might be for legal or political reasons. Therefore, the description and analysis is based on selective texts from the whole transcript (Appendix H) to obtain the data needed and explain the conceptual understanding of the research outcomes.

Question 1: Are there any regulations for the school design?

"*We are working to apply a new vision in our new school's design to take into consideration, especially the school users, each student is important for us*" (See interview transcript in Appendix H)

The DDE mentioned that there are two crucial elements in designing schools; First, the students' needs are the main focus in school environment; for example provide open and privacy spaces for their learning is important. Second the provision of appropriate facilities for teachers.

Question 2: Are there any standards for the classroom arrangement and environment?

The concerns mentioned by the DDE suggested that:

- Appropriate classroom size is 80 square metres designed for 24 students
- Entrance doors are to be placed at the side of the classroom.

---

6 The code (DDE) used in this chapter refer to the interviewee (Director of Design and Establishment).

- Windows that allow appropriate lighting and ventilation are important.
- A whiteboard located in middle of classroom needs to be visible for all students.
- Effective cooling system is required.
- Consideration needs to be given to the ergonomics standards for intermediate schools.
- IT facilities are essential.

Question 3: How can students' and teachers' performance be enhanced within their environment?

The DDE said it was necessary to provide an environment that is characterized by appropriate classroom layout, positive colour, effective natural lighting, and modern design, which interacts with and motivates the students and teachers in the school.

These three questions discussed the criteria from the official point of view about the learning environment. Further discussion of the interview is expanded in chapter eight, which evaluates the outcomes of the case study with the interviewee.

Chapter Seven

Analysis of the case study outcomes

The design of the research

Background study:

Identifying the gap in the existing knowledge to validate the research proposal

Aim and objectives:

To develop a better understanding of the interrelation of physical environment and learning performance

Identification of important physical elements/factors which have important bearing on learning environment

Exploring socio-spatial organisation of learning environment

Examining feature that characterises the learning environment

Assessing the mechanism of integration of all socio-physical factors in learning environment

Conduct a Pilot Studies in random schools in Kuwait to obtain an initial data and check the methods

Literature review:

Promoting the approach of the study and developing a conceptual framework for the research

Research concept

Research questions

Research strategy

Empirical work:

Establishing criteria for the case study

Tracing the physical and environmental characteristics of selected schools

Examine the students' performance and motivation in each school

Comparative analysis of the collected data from the case study

Responding to the research questions by summarising the findings and suggesting the research implications for practice and research

Conclusion:

7 Analysis of the case study outcomes

To assess the influence of the physical learning environment on students' and teachers' performance, behaviour and interaction, three case studies were conducted. In Chapter Six, the description and statistical data of the case studies is provided. This chapter presents an interpretation towards answering the research questions that aimed to evaluate the physical learning in Kuwait. The comparative data of the physical survey, observation and school inventory (questionnaires) have shown interrelated variables. These variables were classified to three groups of factors, which would be an important indicative to evaluate the school buildings and classroom environment outcomes. These groups are as follows:

Group 1: Investigating the effects of the school built environment towards enhancing learning performance.

Group 2: Assessing the quality of classrooms physical environment and its influence on learning and teaching outcomes.

Group 3: Examining the impacts of the classroom physical settings on students' and teachers' communication, interaction and performance.

The analysis strategy started from a wider perspective that evaluated the condition of the school building, then focused on assessing the interior quality of the classroom, and its impact on teaching and learning interaction and performance. The following sections highlight and evaluate the outcomes of the three groups.

7.1 Group 1: the built school environment quality

This group aims to assess the quality of school built environment factors towards learning performance. The school's built environment quality includes factors such as the school age, location, spatial properties (spatial socio-cultural), school population and size. The collected data were classified within three data sets Tables 59 and 60 are based on the physical survey

methods, and Table 61 is based on the student questionnaire. Comparative analysis of these data sets is important to show whether the relationships between these variables are influenced by the school environment.

Table 59. The general background of the Schools built environment

	Schools 1	Schools 2	Schools 3	Schools 4	Schools 5
Built date	1975	1984	1986	1987	2011
Location	Edge of the city 31 km West of Kuwait city	Edge of the city 30 km West of Kuwait city	Satellite Town 8 km from Kuwait city	Satellite Town 6 km from Kuwait city	New town within 25 km of Kuwait city
Students background (Culture)	Bedouin	Bedouin	Mixed social stratification	Urban People	Mixed social stratification
Site Size	12250 m²	19480 m²	19220 m²	34000 m²	16837 m²
Students population	480	335	666	500	410

Table 60. The results of the school facility appraisal applied for each school in this research, the model borrowed by (Hawkins and Lilley, 1998). (See Appendix C for more details)

	Sections	Schools 1	Schools 2	Schools 3	Schools 4	Schools 5
1.	**The School Site**	79%	60%	68%	69%	77%
2.	**Structural & Mechanical**	72.5%	38%	65%	61.5%	74.5%
3.	**Plant Maintainability**	61%	52%	64%	51%	74%
4.	**School Building Safety and Security**	55%	42.5%	55%	53.5%	63%
5.	**Educational Adequacy**	72%	60%	62%	62.5%	66%
6.	**Environment For Education**	74.5%	49.5%	33.5%	55%	71.5%
	School Total	**68.8%**	**48.3%**	**56.3%**	**58.5%**	**70.1%**
	Category Rating	**Borderline**	**Poor**	**Borderline**	**Borderline**	**Satisfactory**

Categories	Very Inadequate 1-29%	Poor 30-49%	Borderline 50-69%	Satisfactory 70-89%	Excellent 90-100%

Table 61. The students' responses regarding environmental quality of the school

		School 1	School 2	School 3	School 4	School 5	Total
I like my school.	Yes	83.3%	67.3%	52.4%	69.2%	89.9%	70.4%
	No	16.7%	32.7%	47.6%	30.8%	10.1%	29.6%
I like to come to School every day.	Yes	66.7%	49.5%	37.6%	51.0%	79.7%	55.4%
	No	33.3%	50.5%	62.4%	49.0%	20.3%	44.6%

School building age

The quality of the school building might have correlation with it age. In this study the five selected schools were built between 1975 and 2011(see Table 59); the older schools were refurbished during the last 5 years. Table 60 shows that the newest built school (**School 5**) and the oldest built school (**School 1**) gained highest rating results in term of the school facility appraisal. Although there were some variations in appraisal, the overall school building quality was similar. Whereas the **Schools 2**, **3** and **4**, which have been built after the oldest school (**School 1**), gained between 48-58% as lowest rating results. This reveals that the overall quality of school building in Kuwait is not usually affected with school built age.

Students' responses to their schools within the questionnaire as presented in Table 61 show similar results with the school facility appraisal. The newest built school had the highest students' positive responses, followed with oldest school, which shows more preference attained for the new school. The teachers' responses to the school facility were not in comparable with the student's responses; their expectation for the school development was higher, and they suggested more improvement was required. It could be assumed that students' preferences for their school environment were somehow dependent on quality of the building. *Taylor and Enggass (2009)* refer to the effective learning environment role that is to enhance the motivation and engage the students, and teacher's performances.

The literature review indicated a number of studies that have postulated a convergence between the quality of the schools building and the learning outcomes *(Kopec, 2006;Long et al. , 2011)*. The new perspective to building new schools are based on feasibility studies for

the user's needs and requirements, which support providing inspirational and creative spaces for learning and teaching *(Plotka, 2016;Burke, 2007)*. These considerations affect the establishment of newly built schools: new school buildings are more effective than old built schools.

In this research, there is no direct evidence among the school built age as a crucial factor that affects the learning environment quality. However, a better quality of school environment that achieved through critical improvement shows positive results on learning and teaching performance. It can be concluded that provide effective school environment depends on the successful feasibility studies, which have appropriate physical features.

School location

The selected schools in this study were situated in different locations (see Table 59). The geographical location of the school itself is not a particular issue, but the quality of the school site features, which are easily accessible for the users. The first section about the school facility appraisal as shown in Table 60 indicated the highest schools site ratings in this study were **Schools 1** and **5**. These two schools are located in different geographical sites, were removed from undesirable traffic, and industrial areas (see Figure 134), with sufficient landscape features and parking facilities for the student, teachers and parents. The students' positive responses in these two schools were also the highest in this study. This study discovered that the school site that is located in non-busy areas increases the student's and teacher's satisfaction and improves the learning performance.

Figure 134. The School 1 entrance and the large car parking facility

School site quality was recorded as lower in **Schools 2**, **3** and **4** which are located in large residential towns, with high traffic near to other schools and government buildings (see Figure 135). Less positive responses from students in these schools were obtained. The school administrators' comments in these schools confirmed that a school that is located in busy areas, within narrow roads without proper available parking caused distractions to the teachers and parents. This reveals that the school site that located in busy area negatively affects the user's behaviour.

Figure 135. Left image - School 3 entrance that shows the lack of parking for parents and visitors. Right image – School 4 entrance shows a busy area near to government buildings.

The environmental psychological impact was discussed in Chapter three, empahsising the importance of school location on learning effectiveness. *Taylor and Enggass (2009)* confirme that the perfect physical learning location is designed with careful attention to the site, nature, landscape, and cultural features, which engage the student's body, mind, and spirit for learning. The schools must be in an appropriate site from the students' homes; reassuring parents and encouraging students to walk to school, with proper facilites and features that enhance their learning behaviour and performance *(Tester, 2009;Trancik and Evans, 1995).*

Spatial properties (spatial socio-cultural aspects)

In the context of Kuwaiti intermediate schools, it can be seen from the results of school facility appraisal in Table 60, **School 5** and **1** gained the highest rating in section 6 (the environment for education) where the availability and quality of students' areas enhanced their interaction and social behaviour. These two schools provide a variety of spatial properties and open spaces relating to the students' background and preferences, which was confirmed by positive responses from the students' questionnaire (see Table 61). Bedouin

tents provided in schools located in a Bedouin geographical area (see Figure 136), multiple open spaces, science clubs, play room for students to gather and interact (see Figure 137), and sport activities were in the school courtyard available for students in the free time are important (see Figure 138). These areas encouraged students' sense of belonging with their culture, and engaged them in sports activities.

Figure 136. Bedouin tent in School 1

Figure 137. Social open areas in School 1

Figure 138. Sports activities available for students in School 5

A strong relationship between a student's interaction and learning quality has been reported in the literature, which was discussed in Chapter three (Section 3.3). Integrating and understanding the students culture, history, and tradition with their learning processes enhances their performance and behaviour *(Davis, 2000)*. Providing variety of socio-cultural spaces in the physical school environment enhances the student's performance, behaviour and ability to adopt and altering effectively in learning *(Strong-Wilson and Ellis, 2007)*. In addition, *Dudek (2005)* mentioned that school facilities and features should be part of socio-cultural communication spaces; each school has to emphasises on their students' social and cultural characteristics through the school environment.

The outcome of this factor complies with the literature that towards excellence learning provision in Kuwait needs to pay attention to student's social, cultural interaction and background in the school environment. Thus, it can be assumed that encouraging students' communication and interaction through their school environment improves their positive behaviour and performance for learning.

School population and size

The selected five schools in this research were in different size and student's population. Two comparisons were conducted; first comparison is the impact of school population in this study. **School 3** had the highest student density, and acquired a 'borderline' quality rating in the school facility appraisal, and attracted significant negative responses from students. Surprisingly, **School 2** had the lowest student density but attained 'poor' building quality ratings in the school appraisal and also negative responses from students. This could indicate that the student's behaviour and performance is not necessarily influenced by high student density.

The second comparison concerns the impact of the school size. **School 4** was the biggest school in this study; it attained 'borderline' quality in school facility appraisal, and significant minority of negative response from students. The more surprising correlation is with the **Schools 1** and **5.** These two schools were the smallest size in this study but scored higher quality ratings in the school appraisal, and received the most positive responses from students, demonstrating that the small schools in this study were more effective than the larger schools.

The psychological aspects of physical environment are discussed in the literature, indicating that school size and a high student density affected the students' learning performance and outcomes, which can decrease social interactions, privacy, and behaviour *(Moore et al. , 2003).* However, an effective use and features of the physical spaces have a crucial impact on learners' outcome and performance *(Lackney, 1994).*

The finding of this factor in the context of Kuwait schools shows there is no correlation between the large school size and student population density on the school's educational success. The highest positive responses from students were reported from the schools that had higher building quality. Taken together, these results match with the literature, which suggests that there is strong correlation between the overall quality of school building and the students' performance and behaviours.

Summary of Group 1

- The school built age has no direct impact on the overall school's level of educational success.

- Students' preferences and concerns in the school environment depend on the excellence and effectiveness of the building facility.

- Easy access, functional and a well maintained school site have a positive influence on students', and teachers' behaviour.

- Engaging the student's social, culture, and traditions in their learning environment has a fundamental impact on their behaviour and performance.

- The school size and students density in this study have no direct effects on the school building quality.

- Effective physical school environments have positive influences on learning performance and behaviour.

The next group factors discuss the inside elements of the school, assess the physical classroom environment influences on learning.

7.2 Group 2: classrooms' physical environment quality

This group aimed to assess the impacts of the physical and internal classroom environment on students learning behaviour and performance. The outcomes of interior classrooms that involves are the classroom size, density, colour, lighting, seating arrangement, lockers, display, noise, and temperature. The data sets used to analyse and discuss these factors were based on the case study described in Chapter six.

Classroom size and density

In this study, the classroom size and density varyied, which influences the students and teachers differently (see Figure 139). First, in term of student density and the measurements of the physical space size, which plays a significant role in their behaviour and attitudes. Each classroom in this study accommodate between 21 -26 pupils. Studies show that a maximum of 20 students in each cassroom is appropriate in order to improve student attainment, participation, positive attitude, and greater attention from teachers *(Moore and Lackney, 1993;Earthman, 2002a;Allhusen et al. , 2004).* This shows the students density within the five schools studied was greater than the suggested numbers in the literature.

| 44-52 Sq | 51 Sq | 42-61 Sq | 70-82 Sq | 52 Sq |

School 1   School 2   School 3   School 4   School 5
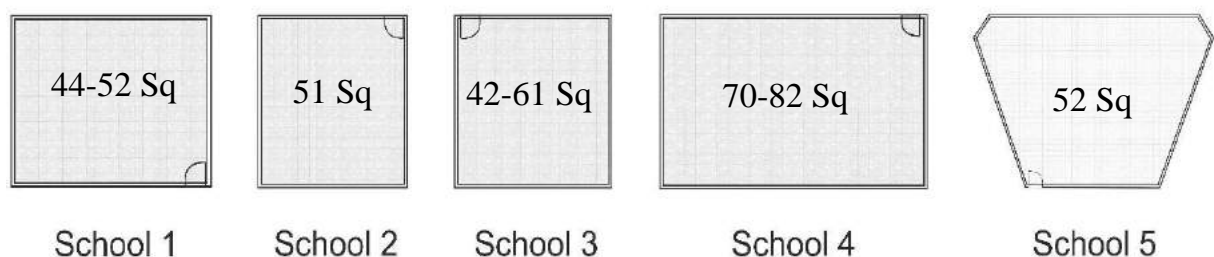
Figure 139: The classroom shape and size in each school.

A positive correlation was found in this study between the classroom size and students' responses. The most positive student feedback in terms of the classroom size was attained for **School 4,** which had the largest classroom size in this study. It shows that students are more likely to prefer larger classrooms. While in terms of comfort; hexagonal shaped classrooms in **School 5** attained higher results. Although the hexagon classrooms were smaller in size than other classrooms, they rated the highest in students' positive feedback and offer improved performance and engagement in observation. This school is the newest built school that has more facilities and features provided than the older schools. Therefore, though the larger

classroom is more preferred by students, higher performance and engagement were observed in classrooms that are small and have more appropriate facilities and layout. It refers to psychological perception of students privacy, esteem, efficacy and expectancy performance; which enhances their ability and desire to learn *(Kopec, 2006;Long et al. , 2011;Weinstein and David, 1987).*

The teachers' feedback was different from students' responses and gave more negative responses for adequate space in hexagon shaped classrooms, due to the lack space that caused a distraction in teaching. This outcome shows the teachers preferred larger classrooms size. However, classrooms in other schools were larger as shown in Figure 139; the teaching system provided and strategies were the same and not suited to the effective learning environment as mentioned in the literature. *Frith (2011)* suggested that a flexible physical environment in school should combine appropriate size, layout, variety of zones and better teaching interactions; these have a significant influence on students' attitude and behaviour.

Overall, these results indicate that the student density in each classroom did not comply with the literature. Although the large classroom were more appreciated by students and teachers, they were arranged inappropriately, not enhancing the learning performance. Whereas, in the hexagon-shaped classroom that was in small size, students were more comfortable and satisfied. This outcome confirms with Group 1 (above) as the effective physical environment features and arrangements is important for better learning experience and performance.

Colour

Varied classroom colours were observed in the five schools, which had different impact and influences on students. Sharp, intense and colourful classroom were offered in three schools (see Figures 140 and 141) and appeared to be not appropriate in learning spaces. The majority of students observed in these classrooms were distracted and disruptive; moreover, they were disliked these colours. A positive correlation was found in the literature confirming this; *Mahnke (1996)* detailed that a colourful learning environment is not necessarily correct, whereas a poor use of colour may cause behavioural problems, e,g. nervousness, lack of interest and energy. It could be assumed that the intense and sharp classroom colours are not suitable for learning environment in Kuwait; which has negative influence on learning behaviour and performance.

Figure 140. Classroom in School 1 and 3 that shows the use of intense and sharp colours

Figure 141. Two classrooms in School 5

Bright colours were used in some classrooms that created a quiet educational environment for students. During the class time as shown in Figure 142, students were more engaged with the teacher and less disruptive. The majority of the school administrators indicated that bright colours in teaching areas were used in their schools. The literature emphasises that bright colours are positive in schools, which can significantly affect the student's perception and stimulation in learning *(Kopec, 2006).* It shows that bright colours used in some Kuwaiti schools have better influences on learning than intense colours.

Figure 142. Students engaged with the teachers during class time in School 2

As discussed in Chapter 3, the function of learning environment requires some of the warm and cool colours for full impact; as the warm and light colours enhance the psychological ability for students, while the strong colours boost students activity and performance *(Engelbrecht, 2003; Mahnke, 1996).* Surprisingly, the student's response towards the light colours in classrooms was not positive, which did not conform to what had been observed. The majority of students in **School 2** were not happy with the light colours. While in **School 4**, more than half of student sample appreciated these colours (see Figure 143). Several explanations could be raised: a student's vision to the classroom is influenced by their cultural backgrounds; which might affect colour preferences. A further study with more focus on colours influence on the student's background is therefore suggested.

Figure 143. Bright colours are shown in Arabic subject classroom at School 4

Lighting

Kuwait is a hot geographical region, which has high levels of sunshine that affects the classroom lighting quality. The classroom lighting depends on the windows for daylight, besides the artificial lighting units. The luminous level was measured on the lighting standard reports *(Zumtobel, 2013)* that state the approximate total luminous level required in educational classroom is 300 lumens per square metre[7]. The results in Table 62 show the summary of lighting condition for each school based the physical survey and observation findings in Chapter six.

Table 62: Calculation figures of the classroom lighting condition applied in this study

	School 1	School 2	School 3	School 4	School 5
Daylight	Good	Satisfied	Poor	Poor	Good
Windows	3-4	3	3 Tinted glass	6 Tinted glass Brick	4 Glass Brick
Artificial units (fluorescent)	4-6	6	6	15 square	15 square
Required Luminous level in each classroom	Between 13200 - 15600	15300	Between 12600 - 18300	Between 21000 – 24600	15600
Actual luminous level in the classrooms *	10000-15000	15000	15000	18.750	18.750
Glare	Yes	Yes	No	No	No
Blinds	Yes	Yes	No	Some	Yes

• based on the standard luminous level per fluorescent unit (Rectangular unit 2500 L. - square unit 250 L)

School 3 and **4** had poor natural light and with average low artificial lighting levels in classrooms, the lighting condition was inefficient and seemed gloomy. The classroom features provided not considered the suitable lighting requirements depends on the classroom size. Blinds were not used in these classrooms, windows were tinted to reduce the direct sunshine into the classroom, which reduced light level (see Figure 144). The classroom door was kept open during class time to allow more natural light in, which increases the noise level and distraction (see Figure 145).

---

[7] Toward calculate the required luminous for each classroom: 300 x classroom sizes (sq.) that equal the required luminous level

Figure 144. Classroom in School 3 shows the lighting condition

Figure 145. Classrooms in School 4 shows the lighting condition

School 5 was better than the other schools; the highest positive responses were collected from this school. Both the artificial and daylight was appropriate and controllable, blinds where available and used properly. The daylight entered through windows and glass brick located in back and front of the classroom. Artificial lighting was organised to reduce the glare on the whiteboard (see Figure 146).

Figure 146. Classrooms in School 5

Many studies have shown that an appropriate lighting level in a learning environment enhances learning and teacher performance. As discussed in Chapter three, two types of classroom lighting were required efficiently in the classroom; daylight (natural) and artificial lighting *(Barnitt, 2003)*. Appropriate classroom layout and window blinds could enhance the ability to maintain the required natural and artificial lighting condition. *Benya (2001)* stated the daylight coming through the windows should be supplemented with artificial lighting to build a comprehensive lighting system. However, *Winterbottom and Wilkins (2009)* stated that incandescent lighting systems gave better results than a fluorescent system in term of academic achievements and reduces off-task behaviour.

The classrooms that had poor lighting conditions in this study lacked considerations such as the insufficient luminous power and no windows blinds or incandescent lighting units provided. These results do not comply with the literature, and are likely to affect negatively the teaching and learning performance.

Another important finding was that majority of the school users concerns about lighting condition were dissimilar with the above findings. Student's concerns show opposite results; for instance two schools had poor lighting condition, yet students responded positively. The teachers' responses were mostly positive; however a small minority of negative responses were collected from schools that had poor lighting. These indicated that the students' and teachers understanding of the lighting condition were not based on full awareness of the suitable lights required in the classroom.

Seating arrangement

Figure 147 shows the rows seating arrangement is mostly used in the schools at this study, while clusters and cooperatives arrangements were used in limited classrooms. Less student's disruptive behaviour were observed in U-shape seating arrangement, with positive engagement and communication with the teacher and other students. In the rows arrangement, students were talkative and not connected with the teacher and caused disruptive behaviour. However, the student feedback indicates they were not happy with their seating arrangement in these classrooms. Whereas, teachers' responses were positive, which could indicate they consider the rows seating arrangement suited their teaching approach. An implication of this

is the possibility that U-shape arrangement was more effective in term of students learning performance in Kuwait classroom than row arrangements.
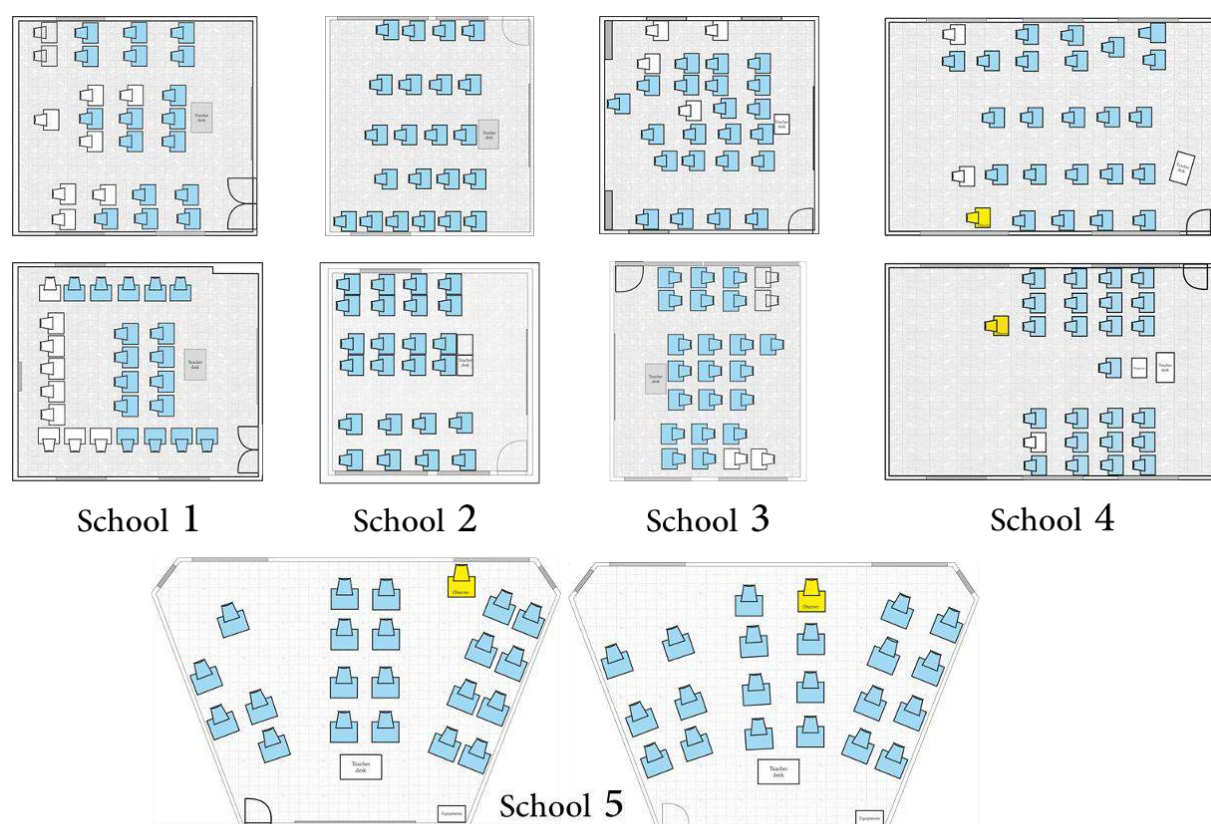
Figure 147. Seating arrangement in some classrooms

The studies in literature reveal that there is a strong correlation between the students' seating arrangement and their outcome and performance. *Wannarka and Ruhl (2008)* mentioned that seating in rows was recommended for theoretical subjects requiring student's attention, but this did not enhance cooperation and discussion within the classroom. *Papalia (1994)* revealed that cluster arrangements could enhance collaborative activity. It can, therefore, be assumed that these research findings were complying with the literature; the row seating arrangement had a negative influence on learning. Row arrangements were applied and preferred by the teachers; due to it suitable for the teaching style in Kuwait.

However, unexpected results were found in **School 5**; although the seating arrangement was in rows, the majority of students were happy with the seating arrangement. The classroom size was small, in hexagon shape as discussed previously. Teachers' concern in this school shows more negative responses than other schools; their comments were based on the size of

the classroom. Hence, it could conceivably be hypothesised that the shape and features of the classroom have an influence on learning and teaching outcomes and behaviour. Students and teachers concerns about the seating arrangement depended on their preferred learning and teaching style.

The provision of flexible seating arrangements was suggested, allowing teachers to change the organisation to suit their teaching style, and enhance students learning *(Bonus and Riordan, 1998)*. As mentioned early the design, size and arrangement of the classroom were not flexible and discouraging the teachers to make changes.

Therefore, the present results are significant in at least two major respects, U-shape seating arrangement and hexagonally shaped classrooms have a better influence on learning and teaching performance. While the poor organisation of the classroom hinders the teacher's ability to improve the classroom arrangement.

Lockers

The results of this case study shows a lack of lockers provided for students in their classroom or school. Just two schools had lockers, but were damaged and not functional (see Figure 148). Students kept their school bags inside the classroom causing a sense of crowding and chaos. Students responded negatively to the availability of lockers in all five schools. **School 4** had the largest classroom size in this study, and each student was using an iPad on a daily school basis; no secure lockers were provided. The school administrators confirm that 70% of the lockers units in schools needed to be repaired, whereas storage and lockers was appropriate for teachers.

As emphasised in the literature about the function of the learning environment, which is to enhance the students' and teacher's needs *(Hirschy and Wilson, 2002)*. Lack of essential elements in learning environment like lockers causing a negative reaction on students *(Ostrosky and Meadan, 2010)*. Providing lockers is crucial for students and teachers in the learning environment. The most obvious finding to emerge from the analysis is that poor lockers availability had a negative influence on the students' performance, and affected their level of satisfaction in the space.

Figure 148. Damaged storage in School 2 and 3

Displays

The schools in this study showed lack of considerations in term of display features; most of the classrooms had no student or teaching displays. Displays about school rules and guidance were found in some schools, not related to the curricula or subject area. However, one particular classroom had some teaching aids displayed through classroom wall; these displays were not used effectively in teaching because it was designed for different lessons. Prior studies outlined in Chapter three have noted the importance of display material to improve the outcomes of learning. *Higgins et al. (2005)* mentioned that having a balance between permanent displays and temporary displays lead to a change of the physical environment, which is important in engaging students. These findings are rather disappointing as the no proper displays were provided, which negatively influenced the student engagement and performance.

Although in **School 1** teaching displays were provided in the specific rooms for each subject's, but these rooms were over-decorated, which distracted the student's attention (see Figure 149). This issue was discussed by *(Dudek, 2000)* who mentioned that using displays in a classroom in the wrong way can distract the students' attention. Another finding seems to clarify that displaying the students work and teaching facilities in learning environment has to be selected carefully to be effective and motivate the students' learning.

Figure 149. Over-decorated room designed for each subject area in School 1

Noise

As shown in Figure 150, the majority of the classrooms in this study had poor acoustic quality, which meant that the noise level was higher than recommended standards. Greater numbers of student responses were negative about the noise levels in their classroom. Poor acoustic quality in classroom can have a negative influence on students learning as discussed in the literature *(Edwards, 2006)*. As mentioned by *(Earthman, 2002b),* the normal noise level in classroom should be up to 40 decibels (dB). Most of the classroom noise level in this study was between 51 -86 dB, both internal and external noise caused this, which had negative influences on students and teacher outcome.
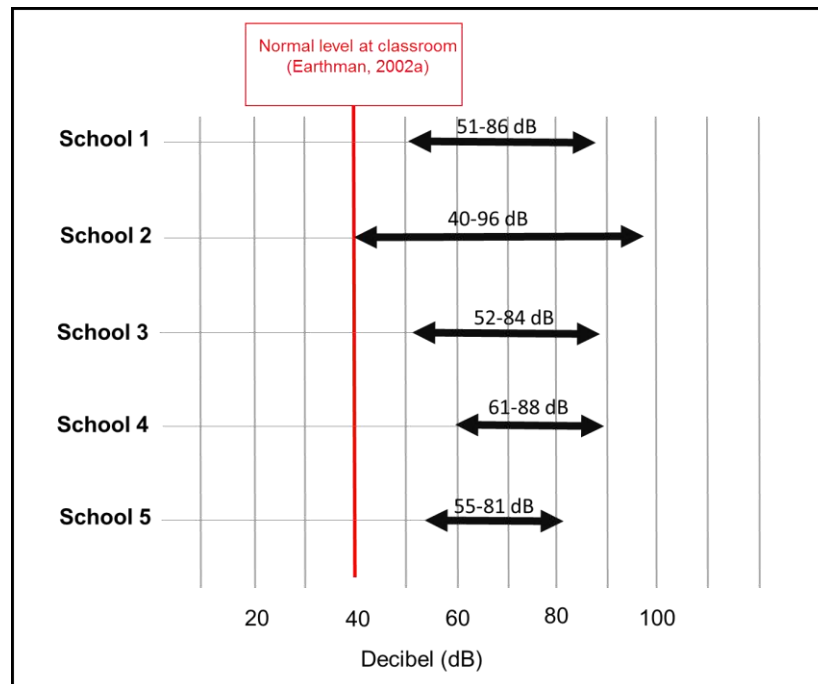
Figure 150. The noise level in this study

As mentioned in the literature; three factors causing noise in the classroom: reverberation, internal and external noise *(Kopec, 2006; Allen and Hessick, 2011; Klatte et al. , 2010a)*. Most of the classrooms in this study had elements that increase the noise levels: walls painted in shiny emulsion, terrazzo or ceramic flooring, concrete ceiling, laminated top furniture, glossy whiteboard as well as blank walls (no displays). The sound waves can rebound off these materials as they are hard surfaces that expand noise level in the classroom. The teacher's voice and furniture movement also caused an echo in the rooms increased the noise level. Therefore, poor acoustic quality distracted the student's ability to hear and understand what is being taught.

Reducing these noise sources effectively can be achieved through changing the classroom settings and features *(Fisher, 2001)*. One unanticipated finding was that in **School 5,** a classroom with carpet flooring had less noise levels than other classrooms that had terrazzo tiles. The student's responses to noise level were less negative than other schools. This reflects the carpet's ability to absorb the reverberation in the classroom. This shows if absorbent materials are used it will crucial to reducing the noise level, which enhances the physical environment quality.

Overall, these results indicate that the quality of the acoustic environment in this study was inefficient, which had negative influence the on student learning. Considering proper physical environment design can reduce the noise levels in the classroom.

Temperature

In this study the thermal quality of the classrooms varied; the investigation was conducted in a winter session. Half of the observed classrooms were cold - none of the classrooms had heating systems. Students were not comfortable in cold classrooms, they were wearing their jackets during the class hour, and were not engaged with the teachers. Whereas in those classrooms that had a reasonable temperature quality, student's engagement was higher. Thus, it could be indicated that classroom with cold temperatures negatively affect the student's performance and engagement.

The students' concerns about the thermal comfort in their classroom were comparable to the above results. Unexpectedly, students in **school 5** attained majority of positive response for appropriate temperature in the classroom. Although this school has no heating system, it was the only school that has an individual thermostat inside each classroom, and the ventilation system was working properly. These outcomes matched with the literature; studies about thermal environmental quality revealed that classroom temperature affects student's behaviour and concentration *(Veltri et al. , 2006; Higgins et al. , 2005).*

Moreover, the ability to maintain an ideal temperature in classroom is important, *(McGuffey, 1982; Kopec, 2006)* confirms that by controlling the thermal environment will significantly help the students' performance. In order to control the temperature quality; 1) thermal insulators must be used to stabilise the temperature, 2) appropriate cooling and heating systems are needed, 3) ventilation systems that refresh the air in the classroom are important. These three elements were not considered in the investigated schools: the older schools had no proper thermal insulation, and only cooling systems were available. A ventilation system was designed only in the new schools which had a built in central air-conditioning system.

Summary of Group 2

- The larger classrooms were appreciated by students and teachers.
- Greater student performance and activities were observed in small classrooms that had a better physical arrangement, in contrast to the large classroom that had a poor quality and arrangements.
- Intense and sharp colours have negative influences on student's behaviour and learning performance, while bright colour have better outcomes.
- Half of the classrooms in this study have poor colour co-ordination, and that influenced the students and teachers performance and outcome.
- Lighting quality was variable in most of the schools; daylight and artificial lighting were not balanced and had a negative influence on students and teachers.
- The seating arrangement was arranged mostly in rows, which has poor influence on student's performance and outcomes.
- U-shape seating arrangement and hexagon classrooms had better impact on students learning performance
- Locker availability for students were poor; which influenced the students negatively and caused a sense of over-crowding in classroom.
- Students and teaching displays were not considered efficiently in the investigated schools.
- Poor acoustic quality in the classroom affect the learning and teaching efficiently, caused by inappropriate construction materials and design features.
- Poor thermal quality in classrooms affects negatively the student's behaviour and performance.
- Classrooms need to be carefully designed, to provide a learning environment that motivates and engages students effectively.

The next group factors, therefore, aim to evaluate the communications and interactions quality for the students and teachers in their classroom environment.

7.3 Group 3: communications and interactions quality

This group evaluates the impacts of the physical classroom features and facilities provided on students and teachers' communication and interaction. The factors involved are the students' interaction, teachers' movement, classroom facility and teaching utilities in the classrooms. The data sets used for analysing these factors were based on case studies that discussed in Chapter six.

Analysis of students' interaction

This study has shown that student's interaction and role in the classroom was limited. Students were seated in particular places for the whole school year, with restricted movement. Majority of the lessons took place in the same classroom, with the same arrangements. The classroom environment was designed particularly for the teaching proposes that similar to the dictation style of teaching. Less attention was paid to the students' engagement and interaction for learning. Students' feedback about their right to change their classroom environment in this study were negative. It can, therefore, be assumed that restricting the student's communication, and participation in the classroom, undesirably influencing their behaviour and performance.

Surprisingly, no differences were found in **School 4,** that have allocated classrooms for each subject area and students could change their position in the classroom. Students behaved in this school like other schools, which did not preferred to change their places. It also complies with the previous outcome, the teaching system is dominant in the physical arrangement of the classroom.

As discussed in Chapter three, the classroom environment must give a message to the students about what is to be expected to happen. The educational cognitivism theory emphasised that knowing how students gain knowledge is important, providing teaching style that stimulate students' cognitive processes like visual, auditory and kinaesthetic senses, can enhance their learning and experience *(Weiner, 1985, Jordan et al., 2008, Davey and Sterling, 2008).* The teaching style in this study was the opposite of the literature; just the visual and auditory senses were stimulated within the student's cognitive skills. The classroom environment was

based on the teaching system, as teachers deliver the knowledge and students listen, which had inappropriate impacts on students' learning excellence. The literature reveals that the student's ability to move and interact in the classroom environment is important, and also affects their behaviour, understanding, and learning *(Hirschy and Wilson, 2002)*.

However, some cases in this research show positive results; small engagement for the student's kinaesthetic sense has better outcomes. Students who took part actively in the lesson, by writing on the whiteboard, or involving in competitor activity during the lesson, were more communicative and interactive due to kinaesthetic senses being engaged with the visual and auditory senses. This finding matches the literature, with more senses are involved in the learning the outcomes will be better *(Biggs and Tang, 2011)*. The curricula and classroom environment has to stimulate the student multi-sensory way, to assist students' understanding *(Massaro and Cowan, 1993, Markus and Zajonc, 1985)*. The present results are significant in at least two major respects. First, is engaging the student's senses shows positive influences on learning performance. Second, the students' motivation and interaction in the classroom were not engaged.

Analysis of Teachers' movement

Teacher's performance varied in each school depending on the classroom arrangement and layout, which impacts the students' differently. Teachers' movement in most observed classrooms were limited to the teacher's zone only; whereas some teachers were seated while teaching during the whole lesson (see Figure 151 and 152). Students in these classrooms were non- active, front row students were more focused and involved with the lesson than those in the back. The main reason that causes this issue seems to be poor classroom arrangement and size. Unbalanced seating arrangements in small space induces a crowded environment. Additionally, narrow spaces in front of the classroom disturbed the teacher's movement. *Earthman (2002)* and *Salama (2009)* indicated that the physical learning environment quality affects the teaching and learning performance; as poor classroom settings reduce the efficiency and productivity of teachers. Thus, it could be assumed that poor classroom features in Kuwait schools negatively affected the teaching performance.
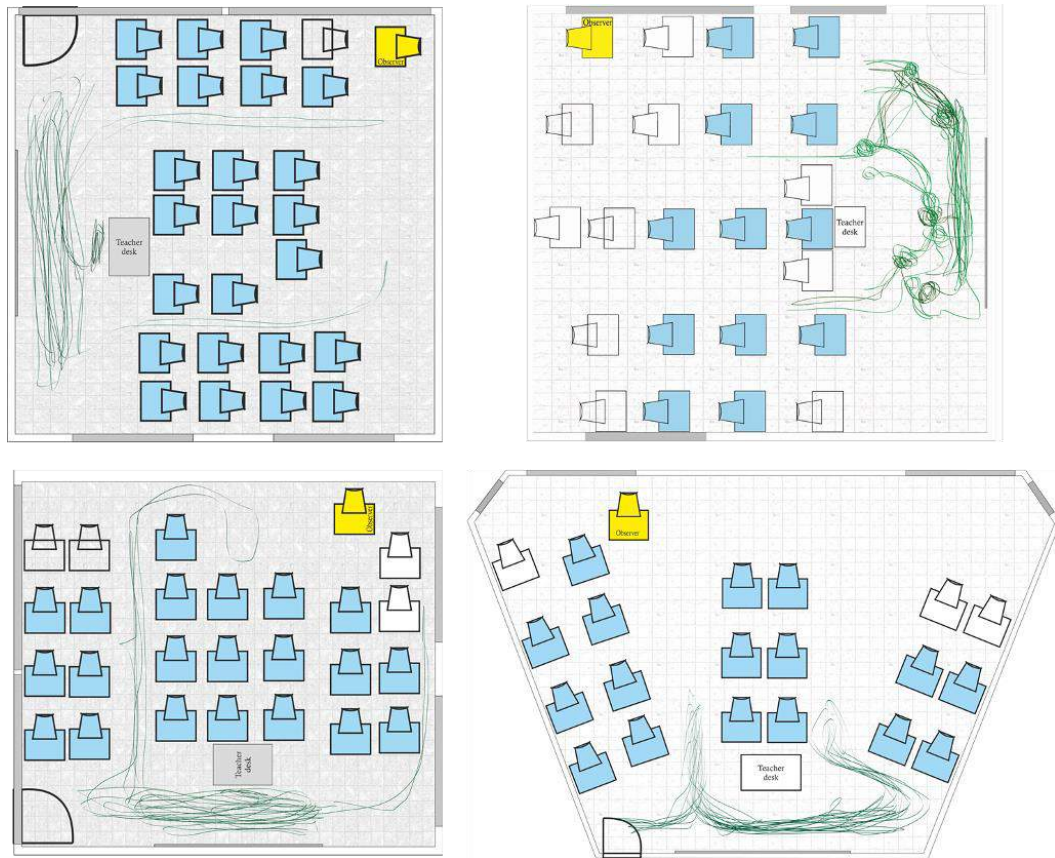
Figure 151. Limited teacher movements in some observed classrooms

In contrast with the first conclusion, the teacher movement in balanced seating arrangements and large size classrooms were the same; the teachers did not circulate effectively as shown in Figure 152. As discussed in Chapter three, studies stated that teachers need to foster the students' social interaction and stimulation *(Fisher, 2001)*. Teachers' location and movement in the classroom are crucial factors for effective classroom management. Circulating around the classroom and communicating with all students improves their learning quality *(Lim et al., 2012).* It can be shown that teacher's role in classroom is not just to transmit knowledge, but also to engage, motivate and interpret students' acquisition of knowledge. As shown in Figure 153, teacher's movement in some classrooms were better than others, which enhanced the students' learning outcomes. These findings may help us to understand the importance of teacher's performance and productivity in the classroom.
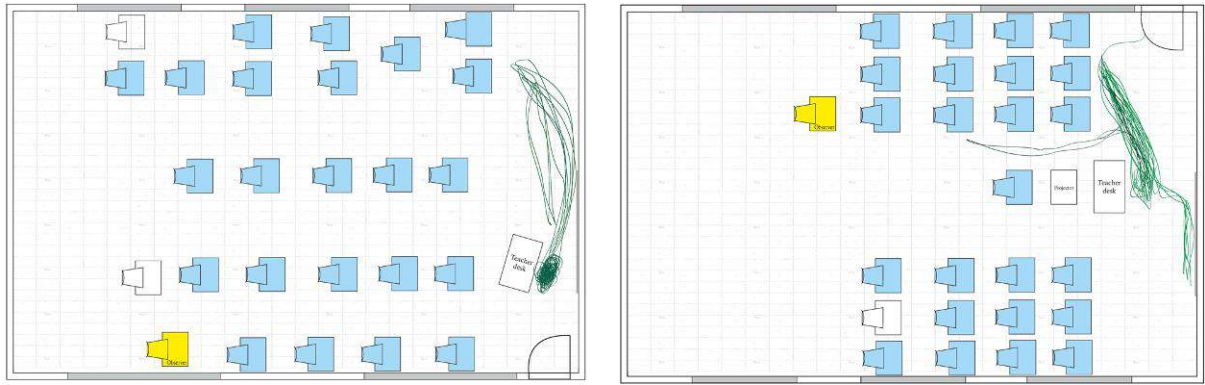
Figure 152 . Poor teacher's movement in large and balanced arrangement classrooms.
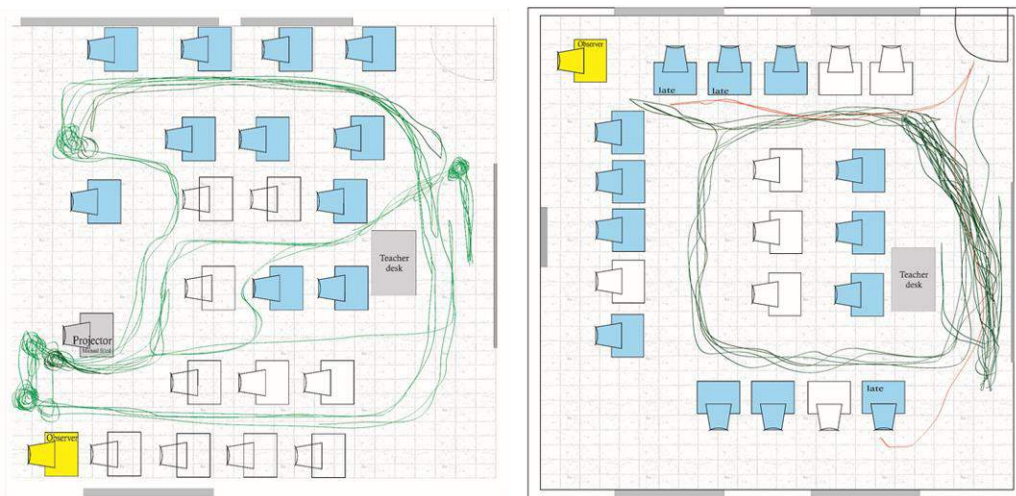
Figure 153 . Teacher's movement in these classrooms were better than other classrooms.

Most teachers questioned asserted that the classroom space was good and enhanced their movement in contrast to other views. Interestingly, the observation shows that they paid less attention to circulating and attracting the student's attention. Further research is suggested to investigate that variation of results.

These results comply with the literature, which indicates that not only the classroom environment has an impact on teacher's movement, but also the teacher's performance and productivity also played a fundamental role. From this study, the teachers are advised to promote their communication skills and teaching quality in order to enhance the student's positive interaction in learning.

Analysis of Classroom facilities

Evaluation of the resource and facilities for teaching and learning in this study are illustrated in the following two sections

Learning spaces

The whole classroom environment in this study was used for instructive teaching only as shown in teacher's movement section. Students spend most of their day in one classroom, with the same environment and arrangement. There were no space provided for students socialising, personal study, and quiet places or computers facility inside the classroom. Two schools in this study had dedicated classrooms. However, these classrooms were not arranged conductively; some of them were over-decorated and colours that distracted the students' attention, while others were designed like many other schools. This reflects the common style of dictation or instructive teaching system that determines the classroom environment arrangements.

The literature discussed the social and psychological impacts of learning environment on students, emphasising the students' performance and activity in connecting with the surrounding environmental quality *(Long et al., 2011)*. The capability of the physical environment to adapt to varied students' needs is crucial in today's education. Creativity and adaptability of spaces enhances the student's interaction and motivation for learning (Frith, 2011). While *Gifford et al. (2011)* suggests to reducing the negative effects of density in the classroom through careful environmental design, a variety of zones and partitions inside the classroom could provide more areas for students within limited space. Therefore, the classroom environments examined in this study gave little consideration to the provision of diverse spaces to motivate the students' learning and performance.

Teaching facilities

The results of this study indicated that teaching facilities were limited. The whiteboard was provided in all classrooms as the main mechanism, while ICT facilities were varied. Two schools had computers and projectors in each classroom and were accessible by the teachers; the observation and questionnaire in regards the classroom facilities showed positive results from these schools.

Negative results were recorded from schools that did not provide proper teaching facilities in each classroom. Few of these classrooms had outdated and inappropriate facilities that were not suitable in modern teaching system, like overhead projectors, MP3 players and small screen. These facilities are not engaging the student's senses effectively. Students in these schools gave negative response about the ICT facilities and suggested the need for more interactive technologies.

This research outcome agrees with *Cotterill (2013)* who mentioned that students preferred to learn through the use of integrated technological resources that stimulate their senses. Prior studies that have noted the importance of ICT features *(Higgins et al., 2005, Wilks, 2010)*. Therefore, using more interactive teaching facilities and technology in teaching is important. The outcomes of this research shows that the current classroom has insignificant basic teaching facilities and resources, which affects the quality of teaching and learning performance. Another important finding was that the use of basic technological teaching facilities in this study had positive influences on the student's learning. Although these facilities promote the peripheral attention only for students (visual and hearing senses), it enhanced the teaching efficiently and improved the students' interaction and motivation in learning.

Summary of Group 3

- Less attention has been paid to students' interaction and stimulation in the learning environment, which has negative influence on their behaviour.
- The classroom environment was based on teaching purposes only; the learning environment was ineffective.
- Engaging the student's senses has a crucial impact on learning performance.
- The arrangement of the classroom environment was not flexible and hindered the teachers' productivity.
- The teacher performance in a classroom environment promotes the student's positive behaviour and interaction.
- Limited classroom facilities were obvious in this study, and the lack of learning zones provided inside the classrooms for students learning engagements and motivations negatively affects the quality of teaching and learning performance.
- To improve the teacher's performance in the classroom, the provision of proper accessible teaching facilities is crucial.

Chapter Eight

Analysis and interpretation of the outcomes with the governmental official

The design of the research

Background study:
Identifying the gap in the existing knowledge to validate the research proposal

Aim and objectives:
To develop a better understanding of the interrelation of physical environment and learning performance

Identification of important physical elements/factors which have important bearing on learning environment

Exploring socio-spatial organisation of learning environment

Examining feature that characterises the learning environment

Assessing the mechanism of integration of all socio-physical factors in learning environment

Conduct a Pilot Studies in random schools in Kuwait to obtain an initial data and check the methods

Literature review:
Promoting the approach of the study and developing a conceptual framework for the research

Research concept

Research questions

Research strategy

Empirical work:
Establishing criteria for the case study

Tracing the physical and environmental characteristics of selected schools

Examine the students' performance and motivation in each school

Comparative analysis of the collected data from the case study

Conclusion:
Responding to the research questions by summarising the findings and suggesting the research implications for practice and research

8 Analysis and interpreting of the outcomes with the governmental official

The previous chapter discussed the case studies' outcomes and assessed the influence of the school's classroom environment on learning and teaching performance. The overall understanding of these outcomes was not positive, because the inappropriate physical features affect the learning and teaching negatively. The whole classroom environment in this study was based on teaching with less attention paid to students learning performance. These concerns were interpreted by an educational official who saw the learning environment from a builder or developer perspective. This chapter aims to strengthen the findings from the case studies through a detailed discussion of who is responsible for school design; to understand the reasoning behind these problems. Two main parts developed which will be analysed in this chapter are:

1. The physical school built environment factors; including the developmental responsibility for the school environment and classroom design.

2. The official design guideline, considerations and measurement for the school facilities

1- An analysis of the physical school built environment factors with the government official

The discussion with the Director of the department of design (DDE), was based on the research outcomes that linked to the literature as reviewed below.

Who is responsible for developing the learning environment?

The case studies outcomes showed that the current school's physical environment had negative impacts on the students learning. This point was raised with the official to understand who is responsible for the school building.

The Director of the Department of Design and Establishment (DDE) confirmed that the school design in Kuwait is not under the control of the Department of Design and Establishment. The Ministry of Education had the final word on this matter because they decide whether the Department of Design, local or foreign architects are given the school design contract. Despite this, in some cases, the DDE was asked to provide the users' needs and requirements for the school to forward it to the contractor (See interview transcript in Appendix H). The literature review, in Chapter three, illustrated that the development of the learning environment should be undertaken by three groups: educationalists; architects and psychologists. These groups should share the responsibility of building the best learning environment *(Roberts, 2009).*

According to this data, the development of schools in Kuwait does not correspond with the literature. The educational authority is responsible for school building however, there were no particular plans given to the architects, designer, and psychologists to take part in designing schools.

Where the school designs came from?

The previous point indicates that the current school designs were dominated by an unqualified group who had the greater authority than the expert group in designing learning environment. The case studies also show a variation of the school designs in terms of the architecture, planning, and interior perspectives; which has an impact on students learning. Emphasis what the consideration for the school design and whether it taken into account; this point was raised with the official to explore where the school design came from.

The interviewee (DDE) emphasised that the standards school guidelines included the layout and measurements for the old schools were better than the newly built schools. The Ministry of Education changed its guidance and standards, which reduced the building's quality. Most

schools were built or refurbished within the last 15 years and were based on inappropriate considerations. These schools were designed by local architects within the Ministry of Works, and Ministry of Housing who are not expert in schools design. The school administrators were given permission from the educational authority to make changes in their schools after refurbishment. For example, covering the whole corridors ceilings to shade the classroom from sunshine; this action had negative effects on students in the schools and was done without consultation. Inside the classroom, the daylight conditions were affected, there was a higher noise level, and poor ventilation (See interview transcript in Appendix H).

This problem was seen in this study where many of current schools covered their courtyards and corridors completely to reduce the effect of the hot weather (see Section 5.3 in Chapter five). Throughout the development of Kuwaiti education, the courtyard and corridors were used as main open space in schools for variety of activities. This study showed the considerations of the Design and Establishment department as an expert group were not taken into account within the educational authority. This outcome confirms *Frith (2011)* point view, who specified that the teachers and educational authorities still have the power on designing learning environment; the architects' and interior designers' role is restricted. The current study identified that the dominant authority by unqualified official leads to incompatible design plans that ignores the guidelines from the expert groups.

Are there any influences of the student's density and school size on school building?

The results of the physical survey showed that the classroom density and school sizes vary in the intermediate public schools and affect the quality of the school building. This point was raised with the official to understand whether it has an impact on school building quality.

The interviewee said that the older-built schools were designed to accommodate 750 students as standard with student numbers reaching up to 35 students in each classroom. During the last few years, the Ministry applied new rules for student density without paying attention to the capacity of each school. The new regulations stated that each school must have a maximum of 600 students in total; within 24 classrooms each accommodating 25 students. This caused major design problems in the already built schools; there were no enough classrooms even in the large schools to accommodate just 25 students per classroom. The Ministry of Education was forced then to build new classrooms in the schools, which ignored

many of the design criteria and regulation to save time (see interview transcript at Appendix H).

In the literature, it has been suggested that having up to 20 students in each classroom improves their learning performance and interaction *(Earthman, 2002b)*. *Barber and Mourshed (2007a)* confirmed that to reduce the student density, it is requires appropriate resources such as enough classrooms, teachers and funds.

The hasty decisions from the educational authority to reduce the student's density, without considering the school capability resources. It seems to be some changes undertaken by the Kuwait educational system that caused a reduction in the school building quality. As illustrated in the case studies, the refurbished schools added classrooms that have different design layouts from the original school plan. Therefore, this outcome complies with what mentioned above within the literature.

The influence of the classroom shape and size on learning and teaching performance:

The case studies showed that the best classroom shape in this study was the hexagonal classroom; although they were smaller, they attained better results. While, students responses to the questionnaire about other classrooms were negative. This outcome was questioned with the official in order to get a more detailed explanation.

The DDE agreed that the hexagon classroom shape is more effective in learning, but small in size. This shape was inspired by theatre design; the teaching area is like the theatre stage and the students are the audience. This classroom shape was proposed over 16 years ago according to requirements at that time. However, it may not be suitable for current teaching systems because many policies and regulations have changed. As the current required classroom size is 80 square metres, this size is compatible with the requirements inside the classroom (see interview transcript in Appendix H).

The literature classified the classroom shape and size within the psychological aspects; poorly arranged and small classrooms could cause aggressive behaviour and low social interaction between students *(Moore et al. , 2003)*. *Long et al. (2011)* points out that large classrooms could be arranged in a variety of shapes which enhance the student's ability, esteem and performance in learning.

In this study, the classrooms size measurement showed most of them were smaller than required standards, with just one school having a large classroom of 82 square metres. These findings are rather disappointing; the classroom environment size did not comply with the official's standards and those cited in the literature. Classroom sizes proved to be ineffective and caused a negative influence on the learning and teaching performance.

The influence of the classroom colours on learning performance

The research shows that the majority of classroom colours were inappropriate. Sharp and intense selection of colours had a negative influence on students learning. This issue was raised with the official to gain their opinion about classroom colour.

The DDE mentioned that the correct use of colours is significant in the classroom. However, most of the educators in Kuwait are not aware of that approach. Each colour can have a different effect; the colours used depend on the function of the space. For example, light blue characterised calm influences, while light purple characterised higher energy influences; both calm and energy are needed in classroom. Red and yellow colours should be avoided in classroom, but could be used in courtyards and open spaces to encourage students to play. Green is recommended in the classrooms; the DDE said that it supports the student's memory. Beige or grey colours are popular in Kuwaiti schools, this colour has little influence on learning. However, the interviewee emphasised that the classroom colours were selected by the school administrators without any consultation. They were not aware of the power of colours on learning which resulted in poor colour selection for the classroom (see interview transcript in Appendix H).

The literature (see chapter three) illustrates that the use of colours in the classroom complies with the interviewee's point of view. The classroom function requires both of the warm and cool colours *(Engelbrecht, 2003; Mahnke, 1996).*

Together these results provide important insights into most of the investigated classroom colours did not comply with the official view and the literature. School administrators use intense colours or beige classroom paints without understanding the impacts of colour on students. Therefore, the interviewee pointed out correct theory of classroom colours that matched with the literature, but was not universally applied in the schools.

Does the condition of the classroom lighting have an impact on teaching and learning performance?

The survey indicated that the lighting conditions in some classrooms were not effective and negatively affected the learning and performance. This issue was asked to the official to understand their concerns.

In the interview, the DDE confirmed that lighting problems could cause low student achievement. Natural light should be significant for making a welcoming classroom area. The windows must be considered part of the architectural design; the natural light should enter from the classroom sides. A problem that the DDE found in the hexagonally shaped classroom was that natural light coming from the back of the classroom caused glare on the whiteboards and shadows on the students table (see interview transcript in Appendix H).

The classroom lighting theory mentioned in the literature review (see Chapter three), reported that poor lighting reduce the students' performance *(Higgins et al. , 2005)*. In addition, both of the natural and artificial lighting should be controllable *(Barnitt, 2003; Benya, 2001)*.

Linking this finding with the case study, the hexagonal classrooms' windows were on the back windows, and blinds were provided to reduce the natural sunlight and glare. These classrooms had appreciated lightings condition in this study. Whereas in the rectangular and square classrooms had only windows at the side windows with no blinds provided. According to the information, the official was aware of the needs for effective lighting conditions in the classroom, but this awareness was not being applied effectively in school design. This finding agrees with the overall findings that the architects' and designers' concerns were not taken into consideration in school design.

Who is organising the seating arrangements and furniture in the classrooms?

This research shows the seating arrangements do not enhance student *learning* performance, because they were designed for *teaching* purposes. The DDE noted that the current seating arrangement is provided from an educational department and is organised by the teachers inside the classroom. The furniture provision (supply) is a Ministry responsibility using local furniture companies. The Ministry usually asks our suggestions about the seating arrangement

and furniture selection but they always not considered it (see interview transcript at Appendix H).

The literature indicates that the seating arrangement should follow the educators' preference, be appropriate with teaching style, and the activities that implemented in the classroom *(Simmons et al. , 2015; Haghighi and Jusan, 2012).*

The present results are significant in at least two major respects. First, there is a positive correlation between the literature and the Kuwaiti educational authority, where the seating arrangement was based on educator's preference. Second, the negative outcome is that the suitable seating arrangement for teaching purpose is rows. Row seating arrangements as reviewed in the literature (see Chapter three) negatively impacts students' learning and interaction.

What are the standards for the facilities provided inside the classroom?

The case studies showed that the schools varied in terms of the facilities provided. The lack of locker facilities and ICT resources were discussed earlier, indicating a crucial influence on teaching and learning performance.

The DDE stressed that all schools should have the same standards. All students had the same rights for good learning outcomes. The department of design believes that providing proper facilities for students and teachers is important. The teaching facilities such as computer and projectors are currently considered within the classroom design, but not supplied universally in the schools. With regards to the lockers, the interviewee emphasised there appeared to be two main reasons for this problem. First, the lockers provided were not sufficiently robust. Secondly, the Ministry and administrators failed to maintain and distribute these lockers effectively. Students were not encouraged to use them properly to keep belongings safe (see interview transcript in Appendix H).

In the literature, it was showed that the lack of the essential physical requirements for the student and teacher affects their productivity and performance *(Ostrosky and Meadan, 2010).* These findings may help in understanding that the official is aware of the importance of providing proper facilities inside the classroom. However, the quality of these facilities

provided was not efficient because non-expert providers do not fully understand the durability standards for these facilities within the learning environment.

Why the classroom acoustic quality was inappropriate?

The results of the case studies showed that the classroom acoustic quality was poor. This had a negative influence on teaching and learning performance.

The DDE's response to this question was confirmed that the problem exists due to weakness in the architectural design of the school building. The main reason seemed to be that allow non-experts to modify the school building without any technical and qualified consultation. Particularly when the school corridors between the classrooms and courtyard were covered to reduce the dust and heat. The external and internal noise increased due to its reverberated inside the school (see interview transcript in Appendix H).

The literature clearly illustrates that the noise levels impacted on students and teachers *(Earthman, 2002b)*. Reverberation is classified as one of the main acoustic problems that could be avoided by architects, interior and urban designers *(Lang, 1996)*. Improving the construction materials that reduce the reverberation and change the classroom dimensions and organisation are also suggested *(Kopec, 2006)*.

A positive relationship between the official's view and the literature has been reported in terms of the acoustic problem in this study because the inappropriate acoustic quality in the classroom is caused by insufficient architectural design.

Why is the thermal quality in some classrooms inefficient?

The case studies showed lacks of thermal quality and facilities provided in the school, as cold classrooms negatively affect students' performance. And just cooling systems were available and poor ventilation condition.

In the interview, the DDE said that the cooling systems provided in the schools were not appropriate. The cooling units direct the cold air to students straight away which causes a sudden cold feeling and increases sickness in students. The classroom should be kept at suitable temperature all the time during school. Ventilation is also an environmental problem

in classrooms; that also can be caused by inappropriate modifications to the school without qualified consultations. Covering the corridors completely as mentioned earlier in some schools, reduced the circulation of the natural air and decreased the natural ventilation in the classroom (see interview transcript in Appendix H).

 Previous studies from the literature noted the importance of the classroom temperature on students' behaviour and achievement *(Veltri et al. , 2006; Higgins et al. , 2005),* and maintaining the ideal classroom temperature was important for effective teaching and learning performance *(McGuffey, 1982; Kopec, 2006).* The results of the case studiea (see Chapter 6) indicated that there were inadequate thermal facilities to maintain the classroom temperature; as only cooling (not heating) systems were provided.

Another finding in this research is rather disappointing. Although of a cooling systems were the only available facility in all schools, The DDE confirmed that the cooling systems were not effective for a learning environment. Moreover, the ventilation problem seemed to exist in Kuwaiti schools and related to insufficiency of the regulations. The development of the school buildings was undertaken without considering the durability and technical environmental design standards. These findings show the reasons behind the poor thermal equality in this research, which refer to apply inappropriate guidelines in the learning environment.

2- Analysis of the guidelines and considerations for the school facilities design with the official

This section aims to analyse the broad outcome of the cases studies which indicated that the physical environment design was based on a dictation teaching system rather than providing an effective learning environment that enhances students' performance. Towards understand why the learning environment is formed in this way; discussing the guidance and considerations that taken into account for school deign is crucial.

One of the considerations is the student's psychological modes within the physical learning environment. The DDE stated that *"We have five senses: hearing, smell, sight, touch and taste. These senses must be fulfilled in the school, not just wood, concrete, bricks and paint.*

Many materials have a special odour, like leather. Soft touch effects are also important for learning and the quality of the environment…. Some of them are in account but not in the right ways." (See interview transcript in Appendix H).

This issue confirms with *Kopec (2006)* views, as the function of the school environment is to enhance the psychological modes of students understanding. This reveals that the official shows some awareness of the students' psychological modes of learning, which comply with the literature. However, this awareness does not corresponded effectively to the Kuwait learning environment.

Another respect raised by the DDE in regards to the arrangement of the classroom in Kuwait. The interviewee mentioned that the current classroom size increased to 80 square metres to improve the teacher's movement, and provide space for a computer and projector to be used (see interview transcript in Appendix H). Additionally, the requirements and specification report was collected from the DDE which outlines the measurement of the facilities that are required in school based on the Ministry of Education preferences (see interview transcript in Appendix I). There was no specification or attention for student's social spaces, personal or group learning zones or even accessible ICT facilities for students to be considered in the classroom. The literature states that 21st century education has moved from traditional method of dictation teaching, towards a more flexible systematic learning that let students gain knowledge without direct instruction *(Pearlman, 2010; Lackney, 1994).* Overall, this indicates that the official vision is still on *teaching* not *learning*.

DDE indicates that there are regular school inspections visits in order to meet the teachers, school staff and administrators. Aims to facilitate the required and appropriate inspections to schools based on them. These visits were significant to improve the school design. For example, schools that were built in the last few years (hexagonal classrooms) were built on a variety sites in Kuwait; the department of design and establishment discovered many architectural and functional problems in those schools after a few years completion (see interview transcript in Appendix H). The literature indicated that the school building design should be based on proper feasibility studies (evidenced based research) that developed by educationalists, architects and psychologists, as mentioned in Chapter three (section 3.4). This finding is a rather disappointing outcome; it showed that the school buildings were built without proper awareness for the architectural standards and required measurements for teaching and learning.

The process of school design in Kuwait

Before building or refurbishing any school in Kuwait, procedures and considerations should be taken into account, in order to be authorised by the Ministry of Education. This process was discussed with the official, as follows:

Firstly: Specifications from the Ministry's deputy office need to be sent to the Department of Design and Establishment.

Secondly: Formation of the design proposal needs to be sent out to other Departments within the Ministry.

Thirdly: Modify the school design must be based on the received recommendations, and then the final design proposal sent to the Ministry deputy office for approval.

The main problems as mentioned by the DDE appear after the approval of the design; many changes to the original proposal were undertaken by the Ministry. These changes were authorised to reduce the construction period, or approve the school administrators request to refurbish the school features (see interview transcript in Appendix H). Therefore results were not very positive because these changes were applied without consulting an authorised design and architectural department causing problems in the physical school environment.

These findings will doubtless need further in-depth investigation, but there are some immediate conclusions for this research. As stated by the DDE, there is no special department or group within the Ministry of Educational responsible for inspecting and evaluating the quality of school environment. Unfortunately, there is also a lack of local research (case studies) that investigating the quality of school environment in Kuwait; as the DDE emphasised that they consider foreign studies within the school design proposals.

Summary of the chapter eight

The study has gone some way towards enhancing our understanding of the reasons behind the inappropriate school building quality. These caused by the official bodies; the Ministry of Education and the department of design and establishment. The present findings are significant in three major respects;

- Poor school design proposals indicate no clear guidelines for the school building based on proper feasibility research and considerations on Kuwait.

- Inadequate design quality processes dominate the role of developing the learning environment. The Ministry of Education is able to authorise any changes in the original school design without consulting the department of design and establishment.

- Unavailability of a particular team or organisation for evaluating and support the quality of the new and exciting school environment.

Chapter Nine

Conclusion

The design of the research

Background study: Identifying the gap in the existing knowledge to validate the research proposal

Aim and objectives: To develop a better understanding of the interrelation of physical environment and learning performance

Identification of important physical elements/factors which have important bearing on learning environment

Exploring socio-spatial organisation of learning environment

Examining feature that characterises the learning environment

Assessing the mechanism of integration of all socio-physical factors in learning environment

Conduct a Pilot Studies in random schools in Kuwait to obtain an initial data and check the methods

Literature review: Promoting the approach of the study and developing a conceptual framework for the research

Research concept   Research questions   Research strategy

Empirical work: Establishing criteria for the case study

Tracing the physical and environmental characteristics of selected schools

Examine the students' performance and motivation in each school

Comparative analysis of the collected data from the case study

Conclusion: Responding to the research questions by summarising the findings and suggesting the research implications for practice and research

9 Conclusion

This research aimed to investigate the relationships between the quality of the physical learning environment on learning and teaching outcomes. The study focused on the quality of architectural and interior spaces including; the school building, classroom physical factors and its influence on performance. This thesis consists of three parts to discuss the research question, aims and objectives. Part one (Chapters 1, 2, 3, and 4) reviewed the theoretical and methodological foundation. Part two (Chapters 5, and 6) discussed the historical development of the Kuwaiti learning environment, followed by the case studies and interview results. While part three (Chapters 7 and 8) investigated the outcomes of the research and compared them with the literature. This chapter represents the conclusions of the study.

9.1 The summary of the chapters

Chapter one introduced the context of the research background and problems, then presented the aims, objectives and the research questions to underline the importance of the study. The literature review was discussed within two chapters; **Chapter two** outlined the philosophy of education in relation to the learning environment. It also represents the theory of learning environment in terms of the educational theories (behaviourism, cognitivism and constructivism). The review provided insight into the influence of effective learning environment on the educational system; which indicated the learning quality and teaching experience both are significant for the education.

Chapter three considered the theory of learning environment to indicate the impact of the physical factors on the learning and teaching performance and outcomes. The literature specified the impact of the learning environment were mentioned within five factors; 1) Social environment. 2) Psychological environment. 3) Cultural Environment. 4) Teaching environment. 5) Physical environment. These five factors had impacts on the overall learning

and teaching quality, while this study was focused on the last factor (physical environment). The development, evaluation and assessment of physical learning environment must be considered by the educationalists, designers, and the environmental psychologists; cooperation between these groups are significant to provide an effective learning environment. The evidenced based research were acknowledged about these factors; including the spatial, visual, acoustic, thermal and personal environment.

Chapter four discussed the methodological approach for the research to reach to the objectives. Two parts were presented; the philosophical framework of the research highlighted in parts one; which shows the investigation was based on social relation studies that appropriate to evaluate the experience, behaviour and interaction of the school users. Part two presented the research design that used mixed methods approach to assess the impacts of physical built environment on learning and teaching performance, behaviour and outcomes. Three explanatory methods were conducted in this research; the pilot study checked the validity of the research and tested the planned research procedures. The second stage was the main case studies, aimed to collect the required detailed data for the research based on quantitative methods (physical survey, observation and questionnaire). A qualitative interview was conducted as the last method to gain the official (educational authority) opinions about the quality of learning environment. The final section illustrated that the descriptive analyses planned to be used for these data with reference to the literature.

Chapter five reviewed the research context through addressing the general background of Kuwait, introducing the historical development, social, cultural, economic and architectural growth in relation to the education at the state of Kuwait. Significant attention was been paid to the educational development within three periods. First is the formation of Kuwait till 19th century; the education was informal and traditional. The second period was within 20th century that Kuwait moved to be more systematic and formal education. The third period was from the independence of Kuwait and beginning of the contemporary education system until present. Critical attention was paid to the educational system, policy and objectives within the Ministry of Education. The last section illustrated details about the development of the existing architecture of school building design within the last 35 years.

Chapter six evaluated the outcomes of the investigation with the literature. The outcomes of the pilot study validated the research topic and proposes questions, which enriched and directed the understanding of the research procedures. Then the main section was the

evaluation of the case studies methods, which examined the quality of physical environment and its influence on learning and teaching performance and behaviour. The first method was the physical survey that assessed the quality of the selected schools building. The second method was the observation that evaluated the influence of the classroom environment on learning and teaching performance. The third method was inventory survey that collected opinion about the physical quality, through questionnaires from students, teachers and the school administrators. The last section presented the initial findings of the interview with the official.

Chapter seven analysed the case studies findings that extracted from Chapter Six. The comparative analysis classified the findings within three groups, first about the school built environment, then the classroom interior features and lastly the interaction and communication inside the classroom. The poor quality of the school environment in Kuwait was obvious and that has influences on learning and teaching outcomes.

Chapter eight strengthened the primary outcomes of the case studies through evaluating the official point of views about these findings. Two parts were analysed; the school built environment factors, and the official design guideline. The discussion was enhanced with relevant linkage to the academic literature towards the research conclusion. This strategy enriched the assessment quality of schools building in Kuwait and understands the key issues behind the current problems.

9.2 The research outcomes

This study addresses the gap in research about the relationships between the physical environments on learning and teaching performance and behaviours, in the intermediate public schools for boys in Kuwait. The investigation indicates critical outcomes of the research, which reveal the implicit complexities and issues within the learning environments in Kuwait. This section summarises the research outcomes for answering the research questions and achieve the aims and objectives, then addresses the general contribution to knowledge and the specific outcomes of the research.

Toward answering the research questions; the **first question** in this study sought to determine the overall quality of the physical learning in Kuwaiti intermediate public schools. The results of this study, particularly in chapter 6 and 7 indicate that the school environment standards were ineffective, which was designed for teaching purposes and ignored the learning experience and behaviour. The answer to the **second question** was clearly addressed in chapter 8, as the research has shown that inadequacy of school design proposals, processes and evaluations by the Ministry of Education were the main issues for the poor physical learning environment in Kuwait. While the **third question** was discussed primarily within the literature, as the location and socio-cultural variations of the school has positive influences on learning and teaching experience and behaviour. The first group in chapter 7 discussed this point in detail, this research revealed that engaging the student's social and cultural background in their learning environment has affirmative impact on their behaviour and performance. The **fourth question** in this research was concerned about how and to what extent the physical learning environment in Kuwait affects the learning outcomes. The results of this investigation correspond with the literature and discussion chapter; which shows that optimal school environment facility and arrangement has a critical impact in enhancing the learning and teaching performance, experience and behaviour. Finally, in regard to the **Fifth question**, it was found that students' interaction and stimulation in the classroom have received less attention by the school design. However, although the teacher's performance in the classroom was limited within this study, it were showed some positive influences in promoting the learning behaviour and experience.

Contribution to knowledge

The broad findings from this study make several contributions to the current literature about the role of the physical learning environment on educational success. This study reveals that:

- Previous findings confirms the impact of the classroom environment on the effectiveness of teaching and learning; it has significant influence on students and teacher's performance, behaviour and outcomes. The study contributes additional evidence that the impact of the classroom environment on teaching and learning is correct. The case study findings were comply with the literature as the learning environment have significant influences on students and teacher's performance, behaviour and outcomes.

- Enhancing our understanding of a minimum improvement and excellence in the physical learning environment has obvious positive influence on students and teachers. The case study confirms that the learning and teaching performance was better in schools that have better school building quality.

- This study findings agrees with those of *Frith (2011)* who found that the development of the learning environment is dominated by educators and ignores the other views and concerns. The case study and the interviews indicated the learning environment was controlled mainly with the educators where no critical attention was paid to other important group like architects, interior designers and environmental psychologists.

- The present study makes several noteworthy contributions in term of the methodological strategy, by its integration and mixing of various research approaches in order to evaluate the quality of the school building. The adopted approaches in this research include the case studies which provide a framework for exploring the impact of the environment in relation to the users' experience and behaviour.

- The methodological approach ensured the outcomes of the research are sound. The methods used were based on rich, various and sufficient data-collection systems, including assessments and personal experience of the school, school users' performance and feedback, as well as official concerns about the learning environment. The adopted approach provided deeper, detailed illustrations of the research objective, which may be applied to other studies elsewhere in the world.

Specific outcomes

In terms of the Kuwaiti learning environment and the holistic consideration of various factors that affect learning environments in Kuwaiti schools, the study reveals there are two main issues: First is the current physical learning environment quality of school already operating (built), and second the design proposal and processes for new schools.

First: *The quality of the learning environment in Kuwait*

The outcomes discussed in Chapters six and seven indicated that the overall quality of the learning environment was lower than expected, and not compliant with the standards recommended in the literature. Most of the schools investigated had poor building quality, and the physical factors inside the classrooms, including the spatial, visual, acoustic and thermal were sub-standard. The variations of these qualities between schools had different influence on the teaching and learning performance in the schools investigated.

Unexpectedly, students in the schools have better environments qualities were mostly positive in all other responses. This reveals that the school building quality positively reflected on student's behaviour. This interpret that the quality of some physical factors raised the confident perception for other poor factors in these schools. For example, the seating arrangement were mostly similar in all schools, the students' positive response were higher in school that has better learning environment; further research needed to prove that. The indicative findings of this study are discussed further below.

The research outcomes in terms of the nature of the school building

- The study showed that old schools have been renovated to improve the learning environment and the building structure, so school age is not a determining factor (unless a building has not been renovated). The case studies showed the age of the school building has no direct correlation with the educative quality. In fact the older school had better outcomes than newer built ones.
- The study indicated the quality of school buildings in terms of the architectural, aesthetic, and functional perspectives that satisfy user's needs was more important than whether they had been refurbished without proper consideration of factors conducive to a positive learning environment. The case study showed the small-size local schools situated within easy reach of all users, and have variety of open spaces

and activities for students, showed better educative outcomes than larger schools without these characteristics.

- The student's social and cultural background are correlated with the school building quality. Paying extra attention to their cultural background in the learning environment has a critical impact on their behaviour and interaction. The case study indicated that the schools that provide spaces that relate to students cultural and social background gained better outcomes on student's behaviour and performance.

The research outcomes in term of the classroom environment:

- The study showed the larger classrooms were not arranged in a way that enhanced the learning experience; however they more positively influence students' and teachers' experiences than smaller classroom sizes.

- The results of this research support the idea that changing the forms of physical classroom can enhance the outcomes. Although a hexagon shaped classroom contains the same internal arrangements as rectangular or square shaped classrooms, it has better outcomes on learning and teaching performance.

- The classroom's layout and sizes mostly did not comply with the standards of the Ministry of Education in Kuwait, and this affects the density and movement of students and teachers. The study shows the standards set the physical classroom size in Kuwaiti public schools as 80 square metres, but most classrooms were smaller.

- The present study provides additional evidence of the effective arrangement of facilities in the small classroom had a significant influence on teaching and learning performance. Effective arrangement of seating and other utilities in small size classrooms had better results than in larger classroom that have inappropriate arrangements.

- The typical classroom colours used did not enhance the students' outcomes; the study shows the classroom colours were intense and too bright to be conducive to an effective learning environment. These colours were chosen by the educators who are not aware of the effect the colour has in creating the right atmosphere for study in the classroom.

- The natural and artificial light conditions was inappropriate; the results of this study indicate that the orientation and settings of the classroom can hinder the required amount of natural lighting illuminating a space, whereas the artificial lighting units

were insufficient. This problem was caused by inadequate considerations by educators not trained in this regard, and they need to seek proper consultation.

- The seating arrangement in this study were usually arranged in rows; this arrangement is not effective for student's engagement and learning performance.

- The results of this study presented that insufficient lockers in the school affected the student's satisfaction. The educational authority failed to provide appropriate units and maintain them regularly.

- The poor acoustic quality in the classroom was shown in this study, which caused by rebound the sound waves within the following two reasons. 1) Non effective schools redevelopment plan achieved without expert consultation. 2) Poor physical features in the classroom which increases the reflection of the sound waves.

- This study shows inconvenient thermal condition in the classrooms, which consisted of insufficient ventilation, and ineffective cooling systems. These have a negative impact on learning and teaching performance.

The research outcomes in term of the impact of the classroom environment on student's engagement and interactions

- The classroom environment in Kuwaiti schools was designed for *teaching* purposes; less attention been paid to enhance the students *learning, interaction and performance* within the classroom.

- This research provides a framework for better teaching quality that stimulates and motivates the student's senses and attention, and has a vital positive impact on their learning outcome and performance through effective movement and using teaching facilities in the classroom.

- The classroom seating arrangement and facilities in this study were inappropriate, as it function for teaching purposes that ignored the students learning engagement and interaction. This problem was caused by insufficient awareness of the teachers and educational authorities.

Second: The effectiveness of guidelines and considerations of the school building in Kuwait

As discussed above the school learning environment was typically inappropriate. This section summarises the research outcomes towards understanding the reasons for that. This research indicated that both of the Ministry of Education in Kuwait and the department of design and establishment are responsible for the current schools' design quality. Although the department of design and establishment were noticeably aware of what constitutes an effective learning environment, their role in school design was insufficient. The lack of protocol system within the Ministry leads to marginalise their act to provide ideal school building design. This study has demonstrated for the first time that the deliberate decisions by the educational authority negatively influenced the school design quality, while the architects' and interior designers' roles were not seen as critical. That caused poor physical features in Kuwaiti public schools which affect the learning and teaching performance and outcomes. Therefore, the present study makes three main contributions to the literature in Kuwait, considering the inappropriateness of the learning environment in intermediate public schools:

1. Inadequate school design proposals and considerations; the study shows there is a lack of proper feasibility studies that undertaken particularly in Kuwait, in order to maximise and specialising the learning and teaching performance. The recent schools designs and proposals were inspired from foreign studies that are not necessarily appropriate to the Kuwaiti culture, geography and requirements.

2. Insufficient regulation and guidelines process of school design; the study shows many obstacles and concerns within the refurbished schools design process and also for the new schools. One of the significant issues is the educational authority dominating the decision of the school design. Some of the school proposals created and considered by qualified groups, but unfortunately many changes were applied by the educational authority without consultation.

3. The absence of the school facility appraisal for exciting public schools in Kuwait. The study shows there no particular department or group were responsible for evaluating and appraising the school building. In addition, a clear policy or standards for the school building quality is missing within the Ministry of the Education in Kuwait.

9.3 Recommendations and further studies

This research intended to fill the gaps of knowledge identified in the literature, particularly regarding the circumstances in Kuwait, through exploring the impact of the learning environment in education. The corollary aims was therefore to build a bridge of knowledge between the educators, and interior designers and architects. Further to the conclusions of the research described above, and over the whole chapters that discussed the theoretical foundation of the research, the recommendation of this study is important to suggest some direction for the future research.

This research has raised many questions that need of further investigation. The detailed investigation into the impacts of each physical factor, such as seating arrangements, lighting and acoustics within the Kuwaiti learning establishments was not possible in this research. Therefore, it would be interesting to assess in-depth the effects of each physical factor in order to explore to what extent it affects the learning quality, through conducting critical comparative studies between two factors to assess its impacts on teaching and learning performance and interaction.

Regarding the research methodology, this research used a critical methodological approach as discussed in Chapter four. This study was limited by the time available for the data collection, and depended on the school calendar. The case studies were collected within same time period, the winter season. As the learning environment is influenced with the other condition such as climate condition, to establish a firm understanding of the physical environment it is recommended that multiple data collection be undertaken in the same schools at different times of the year.

As mentioned in Chapter five, there is a lack of literature about the historical and current circumstances and facilities in school buildings in Kuwait. The present study may be the only research that examined the existing school building quality, and also investigated the history of learning spaces in Kuwait. More research is needed to better understanding the historical and existing development of educational buildings in Kuwait to enrich the literature.

The findings of this study have several important implications for improving the quality of learning environments in Kuwait. There is a definite need for authorising an experienced and qualified group that can appraise and evaluate the school building quality in Kuwaiti public

schools. This group could consist of architects, interior designers, educators, and environmental psychologist as suggested in the literature. The group must have the authority to evaluate the school building quality according to regulations that are based on effective evidenced-based research. Plus needs to conduct thorough feasibility research about the effective learning environments in Kuwait aimed at maximising the learning and teaching outcomes. Raising awareness of effective school environments through organised workshops and courses for students, teachers and school administrators will be an important factor to gain acceptance for improvements in the future.

References

AHMED, A. S. & DONNAN, H. 1994. Islam, globalization, and postmodernity, Psychology Press.

AL-ALRASHEED, Y. 1987. The History of kuwait, Lebanon, Dar Al-hayat Pubisher.

AL-BAHAR, H. 1984. Traditional Kuwaiti Houses. *Mimar,* 13**,** 71-78.

AL-BAHAR, H. 1985. Contemporary Kuwaiti houses. *Mimar,* 13**,** 63-72.

AL-BAHAR, H. 1991. Kuwait's Post-War Reconstruction, MIMAR: Architecture in Development. *London: Concept Media Ltd,* 40**,** 14-17.

AL-DUAIG, O. 2004. Kuwait contemporary architecture. *Architecture Reintroduced: New Projects in Societies in Change, The Aga Khan Award for Architecture, Geneva, Switzerland*.

AL-EIDROUS, M. 2002. Kuwait's Modern History, Kuwait, Dar Alkutab Alhaith.

AL-ENEZI, M. M. 2002. *A study of the relationship between school building conditions and academic achievement of twelfth grade students in Kuwaiti public high schools.* Virginia Polytechnic Institute and State University.

AL-HAJI, Y. Y. 2004. Old Kuwait: memories in photographs, Kuwait, Center for Reaerch and Studies on Kuwait.

AL-HUSAINI, M. 2004. *An investigation into factors that may contribute to school violence in male high schools in Kuwait.* Virginia Polytechnic Institute and State University.

AL-JABER, Z. 1996. The leadership requirements of secondary school principals in Kuwait: a post-invasion analysis. *Journal of Educational Administration,* 34**,** 24-38.

AL-MUBALISH, K. 2016. Images for the historical of Kuwait. Kuwait: KuwaitPast.com.

AL-NAKIB, R. 2011. Citizenship, nationalism, human rights and democracy: a tangling of terms in the Kuwaiti curriculum. *Educational Research,* 53**,** 165-178.

AL-QENAEEY, Y. 1988. Pages from the History of Kuwait, That Al-Salasel.

AL-QONAIM, D. Y. 1999. Features of the History of Kuwait, Kuwait.

AL-RASHIDI, H., AL-AZIMI, A. & AL-AJMI, H. 2012. An analytical study of the Education policy towards the educational equal opportunities in Kuwait. *College of Education. Ain Shams University,* 36**,** 585-614.

AL-SARAWI, M. 1992. Effect of Iraqi invasion on the Kuwait environment. *Arab Journal for the Humanities*.

AL-SHALAL, M. 2013. Environmental pollutants and effect of the Iraqi invasion on Kuwait *Our Environment,* 1.

AL-SOROUR, S. M. 1993. The State of Kuwait. U.S: DTIC Document.

ALBESHE, A., AL-REFAI, T. & AL-ALANSARI, A. N.A. *The free atelier (Alghanim House)* [Online]. Available: http://www.nccal.gov.kw/Pages/MonumentsAndMuseums/%D8%A7%D9%84%D9%85%D8%B1%D8%B3%D9%85-%D8%A7%D9%84%D8%AD%D8%B1 [Accessed July 2016].

ALDERAIWAISH, A. 2014. *Teaching the clarinet in Kuwait: creating a curriculum for the Public Authority for Applied Education and Training.* University of Southampton.

ALENIZI, M., GOODWIN, W., ISMAEL, S. & HADI, S. 2008. STR data for the AmpFℓSTR® Identifiler® loci in Kuwaiti population. *Legal Medicine,* 10**,** 321-325.

ALGHANIM, S. 1998. The Reign of Mubarak-Al-Sabah: Shaikh of Kuwait 1896-1915, IB Tauris.

ALGHANNAM, G. A. 2003. *School effectiveness and the goals of education in Kuwait.* University of Birmingham.

ALI, M. 2010. *How can classroom design support and lead students to want to learn and study in Kuwait's public secondary schools?* MA Thesis, Birmingham City University.

ALI, M. 2014. ATINER's Conference Paper Series. ART2014-1047.

ALLEN, B. & HESSICK, K. 2011. *The classroom environment : the silent curriculum.* Bachelor of Science Senior Project, California Polytechnic State University.

ALLHUSEN, V., BELSKY, J., BOOTH-LAFORCE, C. L., BRADLEY, R., BROWNWELL, C. A., BURCHINAL, M., CAMPBELL, S. B., CLARKE-STEWART, K. A., COX, M. & FRIEDMAN, S. L. 2004. Does class size in first grade relate to children's academic and social performance or observed classroom processes? *Developmental psychology,* 40**,** 651.

ALMRSAL.COM 2014. The outside view for ALsaif Palace. almrsal.com.

ALOMAIM, A. 2016. Nation Building in Kuwait 1961–1991.

ALYOSOFI, A. 2011. The damages of the Iraqi invasion to a school building in Kuwait Kuwait: alburhan.org.

ANDERSON, R. & AL-BADER, J. 2006. RECENT KUWAITI ARCHITECTURE: REGIONALISM VS. GLOBALIZATION. *Journal of Architectural and Planning Research,* 23**,** 134-146.

ANREP, G. & PAVLOV, I. P. 1927. Conditioned reflexes: An investigation of the physiological activity of the cerebral cortex.

ARC LINKAGE, T. M. U. 2010. Smart Green Schools, The Unofficial Overview. *The University of Melbourne, Faculty of Architecture, building and Planning.* [Online]. Available: http://www.abp.unimelb.edu.au/research/funded/smart-green-schools/pdf/sgs-brochure.pdf.

ARTHUR, J. & PETERSON, A. 2013. The Routledge Companion to Education, Taylor & Francis.

ASFOUR, K. 2004. Identity in the Arab Region. *Architecture and Identity Research Project Sponsored by VolkswagenStiftung and Berlin University of Technology. www. architecture–identity. de.*

AUGUSTIN, S. & COLEMAN, C. 2012. The designer's guide to doing research: Applying knowledge to inform design, John Wiley & Sons.

AYYUB HUSSAIN. 2013. Ayyub Hussain call for rebuilt Al-Mubarakia School. *Alwatan.*

BAILEY, R., BARROW, R., CARR, D. & MCCARTHY, C. 2010. The philosophy of education: An introduction, Bloomsbury Publishing.

BANDURA, A. 1986. Social foundations of thought and action: A social cognitive theory, Prentice-Hall, Inc.

BANDURA, A., ROSS, D. & ROSS, S. A. 1963. Imitation of film-mediated aggressive models. *The Journal of Abnormal and Social Psychology,* 66**,** 3.

BARBER, M. & MOURSHED, M. 2007a. How the world's best-Performing school systems come out on top. Mckinsey & Company.

BARBER, M. & MOURSHED, M. 2007b. How the world's best-performing schools systems come out on top. McKinsey & Company.

BARNES, D. & SHEMILT, D. 1974. Transmission and interpretation. *Educational Review,* 26**,** 213-228.

BARNITT, H. 2003. Lighting for the future. *Building services journal: The magazine for the CIBSE,* 25**,** 38-39.

BARTLETT, F. C. 1995. Remembering: A study in experimental and social psychology, Cambridge University Press.

BARTON, L. & WALKER, S. A. 2011. Schools, Teachers and Teaching, Routledge.

BENYA, J. R. 2001. Lighting for Schools National Clearinghouse for Educational Facilities.

BERRIDGE, K. C. 2000. Reward learning: Reinforcement, incentives, and expectations. *Psychology of learning and motivation,* 40**,** 223-278.

BERRIS, R. & MILLER, E. 2011. How design of the physical environment impacts early learning: educators and parents perspectives. *Australasian Journal of Early Childhood,* 36.

BIGGS, J. & TANG, C. 2011. Teaching for Quality Learning at University, McGraw-Hill and Open University Press, Maidenhead.

BIGGS, J. B. 2011. Teaching for quality learning at university: What the student does, McGraw-Hill Education (UK).

BIRDAIR. n.a. *The Scientific Center of Kuwait* [Online]. Japan. Available: http://www.birdair.com/projects/scientific-center-kuwait.

BOGHOSSIAN, P. 2006. Behaviorism, constructivism, and Socratic pedagogy. *Educational Philosophy and Theory,* 38**,** 713-722.

BOGLE, R. 2006. National School Design Institute. A Report Of Finding. Washington, DC.

BONUS, M. & RIORDAN, L. 1998. Increasing Student On-Task Behavior through the Use of Specific Seating Arrangements.

BOWERS, J. H. & BURKETT, C. W. 1989. Effects of Physical and School Environment on Students and Faculty. *Educational Facility Planner,* 27**,** 28-29.

BREWER, R. 2007. Your PhD Thesis: How to Plan, Draft, Revise and Edit Your Thesis, Studymates Limited.

BRONFENBRENNER, U. 1986. Ecology of the family as a context for human development: Research perspectives. *Developmental psychology,* 22**,** 723.

BRONZAFT, A. L. & MCCARTHY, D. P. 1975. The effect of elevated train noise on reading ability. *Environment and Behavior,* 7**,** 517.

BROPHY, J. E. 1983. Classroom organization and management. *The elementary school journal,* 83**,** 265-285.

BRUNER, J. S. 1966. Toward a theory of instruction, Harvard University Press.

BRUNER, J. S. 1996. The culture of education, Harvard University Press.

BRUNER, J. S. 2009. The process of education, Harvard University Press.

BRUSSOW, S. & WILKINSON, A. 2010. Engaged learning: A pathway to better teaching. *South African Journal of Higher Education,* 24**,** 374-391.

BRYMAN, A. 1992. Quantitative and qualitative research: further reflections on their integration. *Mixing methods: Qualitative and quantitative research***,** 57-78.

BRYMAN, A. 2015. Social Research Methods, Oxford University Press.

BULSARA, C. 2015. Using a mixed methods approach to enhance and validate your research. *Brightwater Group Research Centre*.

BURKE, C. 2007. Inspiring spaces: creating creative classrooms. *Curriculum Briefing,* 5**,** 35-39.

BURTON, D. & BARTLETT, S. 2009. Key issues for education researchers, Sage.

CABE 2010. Creating excellent primary schools : a guide for clients, London, CABE.

CAINE, R. N. & CAINE, G. 1991. Making connections: teaching and the human brain.

CANTER, D., O'RIORDAN, T. & STRINGER, P. 1976. Environmental Interaction: Physiological Approaches to Our Physical Surroundings. JSTOR.

CARO, R. P. 2008. My Philosophy of Education. *Philosophy of Education,* (M).

CARR, D. 1979. The logic of knowing how and ability. *Mind,* 88**,** 394-409.

CARR, D. 2005. Making sense of education: An introduction to the philosophy and theory of education and teaching, Routledge.

CARR, W. 2006. Education without theory. *British Journal of Educational Studies,* 54**,** 136-159.

CASEY, M. S. 2007. The history of Kuwait, Greenwood Publishing Group.

CASH, C. S. 1993. *Building condition and student achievement and behavior.*

CASPER, M. & BARNETT, E. 2001. A definition of "social environment". *American Journal of Public Health,* 91.

CECIL, C. O. 2014. Modern Architecture Popular in the 1960s. *FotoLibra.*

CENTRAL STATISTICAL BUREAU 2011. Annual Statistical Abstract 2011. 48 ed. State of Kuwait: Kuwait Government.

CENTRAL STATISTICAL BUREAU 2013. Statistical Review 2013. 36 ed. Kuwait: Kuwait government.

CHAPMAN, J. W. & TUNMER, W. E. 1997. A longitudinal study of beginning reading achievement and reading self-concept. *British Journal of Educational Psychology,* 67**,** 279-291.

CHURCHILL, W. 2007. Winston Churchill quotes. *Thinkexist. com* [Online].

COMPAYRÉ, G. & PAYNE, W. H. 2003. History of Pedagogy 1899, Kessinger Publishing.

CONATY, C. 2002. Including all: Home, school and community united in education, Veritas Books (IE).

COSIN, B. 1972. Ideology, Milton keynes, Open University Press.

COTTERILL, S. 2013. An exploration of the impact that the educational environment has on student learning. *CAPTURE, The University of Winchester,* 4**,** 72.

CRAIK, F. I. & LOCKHART, R. S. 1972. Levels of processing: A framework for memory research. *Journal of verbal learning and verbal behavior,* 11**,** 671-684.

CRAWFORD, A. 2013. No More pencils:New designs to cure the school daze. *Architecture Boston.* Boston Society of Architects/AIA.

CRESWELL, J. W. 2009 Research design: qualitative, quantitative, and mixed methods approaches, SAGE Publications Inc.

CRYSTAL, J. 2016. Kuwait: the Transformation of an Oil State, Taylor & Francis.

DAI, D. Y. & STERNBERG, R. J. 2004. Beyond cognitivism: Toward an integrated understanding of intellectual functioning and development. *Motivation, emotion, and cognition: Integrative perspectives on intellectual functioning and development***,** 3-38.

DALY, B. & SUGGS, S. 2010. Teachers' experiences with humane education and animals in the elementary classroom: implications for empathy development. *Journal of Moral Education,* 39**,** 101-112.

DAVEY, G. & STERLING, C. 2008. Complete psychology, Routledge.

DAVID, M. & SUTTON, C. D. 2004. Social research: The basics, Sage.

DAVIES, L. 1969. Education and social science. *New Society,* 8 May**,** 710-711.

DAVIS, D. 2000. Supporting parent, family, and community involvement in your school, Northwest Regional Educational Laboratory.

DEWEY, J. 1916. Education and democracy. *New York*.

DICTIONARY, C. 2015. Cambridge dictionaries online. Cambridge University Press, Cambridge, UK.

DIPIAZZA, F. D. 2006. Kuwait in Pictures, Lerner Publishing Group.

DPREM 2011. A report about the development of the Ministry of Education in Kuwait between 2004 till 2011. *In:* MEDIA, D. O. P. R. A. (ed.). Kuwait: Ministry of Education.

DUDEK, M. 2000. Architecture of schools: the new learning environments, Oxford, Architectural.

DUDEK, M. 2005. Children's Spaces, Architectural Press.

EARTHMAN, G. I. 2002a. School facility conditions and student academic achievement. *UCLA's Institute for Democracy, Education, & Access*.

EARTHMAN, G. I. 2002b. School Facility Conditions and Student Academic Achievement, UCLA's Institute for Democracy, Education, & Access. Los Angeles.

EARTHMAN, G. I. 2004. Prioritisation of 31 Criteria for School Building Adequacy. *American Civil Liberties Union Foundation of Maryland*.

EARTHMAN, G. I. & LEMASTERS, L. Review of Research on the Relationship between School Buildings, Student Achievement, and Student Behavior. 1996. Council of Educational Facility Planners.

EASH, M. E. 2005. Do classroom Spaces Really Works? How Classroom Seating Arrangment Affect Students' Individual Academic , Social , Behavioral Needs.

EDUCATIONAL-PSYCHOLOGY-SERVICE 2002. Promoting positive learning environments. UK: Leicestershire County Council.

EDUCAUSE 2004. Learning Space Design in the 21st Century. 2004 Fall Focus session Summary.

EDWARDS, N. C. 2006. *School facilities and student achievement: Student perspectives on the connection between the urban learning environment and student motivation and performance.* Ohio State University.

EISERMANN, R. 2005. Learning Environments Campaign Prospectus. *In:* INNOVATION, D. A. (ed.). London: Design Council.

ELIOT, T. S. 1968. Notes towards the Definition of Culture.

ENCYCLOPAEDIA BRITANNICA. 2013. *Bubiyan* [Online]. Available: http://www.britannica.com/EBchecked/topic/82709/Bubiyan [Accessed 15 Nov 2013].

ENGELBRECHT, K. 2003. The impact of color on learning. *NeoCon, at http://www. coe. uga. edu/sdpl/HTML W,* 305.

ERTMER, P. A. & NEWBY, T. J. 2013. Behaviorism, cognitivism, constructivism: Comparing critical features from an instructional design perspective. *Performance Improvement Quarterly,* 26**,** 43-71.

FACTBOOK, C. 2008. The world factbook- Kuwait.

FACTBOOK, C. 2016. *The world factbook- Kuwait* [Online]. Available: https://www.cia.gov/library/publications/the-world-factbook/geos/ku.html [Accessed 20 June 2016].

FISHER, K. 2001. Building Better Outcomes: The Impact of School Infrastructure on Student Outcomes and Behaviour. Schooling Issues Digest.

FLOOR, W. M. 2006. The Persian Gulf: A Political and Economic History of Five Port Cities, 1500-1730, Mage Pub.

FOUCAULT, M. 1977. Discipline and punish: The birth of the prison, Vintage.

FRASER, J. W. 2001. The School in the United States: A Documentary History, McGraw-Hill.

FREIRE, P. 1970. Pedagogy of the Oppressed, trans. *Myra Bergman Ramos. New York: Continuum.*

FRITH, K. 2011. Mary Featherston's school designs. *Artichoke,* june 2011.

FRITH, K. & WHITEHOUSE, D. 2009. Designing Learning Environment spaces that Work: A case for the important of history *History of Education Review* vol. 38**,** pp. 94-108.

FRONTCZAK, M. & WARGOCKI, P. 2011. Literature survey on how different factors influence human comfort in indoor environments. *Building and Environment,* 46**,** 922-937.

GARTON, A. F. 2008. Exploring cognitive development: The child as problem solver, John Wiley & Sons.

GHAURI, P. N. & GRØNHAUG, K. 2005. Research methods in business studies: A practical guide, Pearson Education.

GIFFORD, R., STEG, L. & RESER, J. P. 2011. Environmental psychology. *IAAP handbook of applied psychology***,** 440-470.

GINGELL, J. & WINCH, C. 2002. Key concepts in the philosophy of education, Routledge.

GONZALEZ, R. & PADILLA, A. M. 1997. The academic resilience of Mexican American high school students. *Hispanic Journal of Behavioral Sciences,* 19**,** 301-317.

GRACE, A. M., JETHRO, O. & AINA, F. F. 2012. Roles of parent on the academic performance of pupils in elementary schools. *International Journal of Academic Research in Business and Social Sciences,* 2**,** 196-201.

GRENE, M. 1966. The knower and the known / Marjorie Grene, London, Faber & Faber.

GROUP, P. E. S. 2014. "A school building isn't just a collection of bricks and mortar; it's a dynamic learning environment...". UK: Promethean World Plc.

HA-JOON, C. 2011. 23 Things They Don't Tell You About Capitalism, Penguin

HABERMAS, J. 1992. Further reflections on the public sphere. *Habermas and the public sphere,* 422.

HAGHIGHI, M. M. & JUSAN, M. M. 2012. Exploring students behavior on seating arrangements in learning environment: a review. *Procedia-Social and Behavioral Sciences,* 36**,** 287-294.

HAILMANN, W. N. 1874. Twelve lectures on the history of pedagogy, delivered before the Cincinnati Teachers' Association, New York, Cincinnati [etc.], American Book Company.

HAN, K.-T. 2008. Influence of limitedly visible leafy indoor plants on the psychology, behavior, and health of students at a junior high school in Taiwan. *Environment and Behavior.*

HANSCOMBE, K. B., HAWORTH, C., DAVIS, O. S., JAFFEE, S. R. & PLOMIN, R. 2011. Chaotic homes and school achievement: a twin study. *Journal of Child Psychology and Psychiatry,* 52**,** 1212-1220.

HARKER, L. 2007. The impact of housing on children's life chances. *Journal of Children's Services,* 2**,** 43-51.

HARMON, D. B. 1953. Controlling the Thermal Environment of the Co-ordinated Classroom.

HATIVA, N. & BIRENBAUM, M. 2000. Who prefers what? Disciplinary differences in students' preferred approaches to teaching and learning styles. *Research in Higher Education,* 41**,** 209-236.

HAWKINS, H. L. & LILLEY, H. E. 1998. Guide for school facility appraisal.

HIGGINS, S., HALL, E., WALL, K., WOOLNER, P. & MCCAUGHEY, C. 2005. The Impact of School Environments: A literature review.

HIRSCHY, A. S. & WILSON, M. E. 2002. The Sociology of the Classroom and Its Influence on Student Learning. *Peabody Journal of Education,* 77**,** 85-100.

HOEPFL, M. C. 1997. Choosing qualitative research: A primer for technology education researchers.

HOY, W. K. & MISKEL, C. 2013. Educational administration: Theory, research, and practice, New York, McGraw-Hill.

HULL, C. L., FELSINGER, J. M., GLADSTONE, A. I. & YAMAGUCHI, H. G. 1947. A proposed quantification of habit strength. *Psychological Review,* 54**,** 237.

HUMAN RIGHTS AND LABOR 2012. International Religious Freedom Report for 2012: Kuwait. U.S department of State.

HUMMEL, E. & RANDLER, C. 2011. Living Animals in the Classroom: A Meta-Analysis on Learning Outcome and a Treatment–Control Study Focusing on Knowledge and Motivation. *Journal of Science Education and Technology,* 21**,** 95-105.

HUTCHINSON, L. 2003. Educational environment. *BMJ,* 326**,** 810-812.

HYGGE, S. 2003. Classroom experiments on the effects of different noise sources and sound levels on long-term recall and recognition in children. *Applied Cognitive Psychology,* 17**,** 895-914.

INFOPLEASE. 2000a. *Kuwait* [Online]. Infoplease.com/ Pearson Education. Available: http://www.infoplease.com/encyclopedia/world/kuwait.html [Accessed 15 Nov 2013].

INFOPLEASE. 2000b. *Kuwait: Land and People* [Online]. Infoplease.com/ Pearson Education. Available: http://www.infoplease.com/encyclopedia/world/kuwait-land-people.html [Accessed 15 Nov 2013].

JONASSEN, D. & LAND, S. 2012. Theoretical foundations of learning environments, Routledge.

JONASSEN, D. H. 1991. Objectivism versus constructivism: Do we need a new philosophical paradigm? *Educational technology research and development,* 39**,** 5-14.

JORDAN, A., CARLILE, O. & STACK, A. 2008. Approaches To Learning: A Guide For Teachers: A Guide for Educators, McGraw-Hill International.

JSTOR 1979. Proceedings of the Seminar for Arabian Studies.

KCRS, THE KUWAITI CENTER OF THE RESEARCH AND STUDIES, 2002. History of education in the State of Kuwait: A Documentary Study, Kuwait, Ministry of Education, The Kuwaiti Center of the research and studies.

KELLER, J. M. & KOPP, T. W. 1987. An application of the ARCS Model of Motivational Design.

KGO. 2008. *population of Kuwait* [Online]. Kuwait Government Online (KGO). Available: http://www.e.gov.kw/sites/kgoenglish/portal/Pages/Visitors/AboutKuwait/KuwaitAtaGlane_Population.aspx [Accessed 18 Nov 2013].

KILLEEN, J. P., EVANS, G. W. & DANKO, S. 2003. The role of permanent student artwork in students' sense of ownership in an elementary school. *Environment and Behavior,* 35**,** 250-263.

KLATTE, M., HELLBRÜCK, J., SEIDEL, J. & LEISTNER, P. 2010a. Effects of classroom acoustics on performance and well-being in elementary school children: A field study. *Environment and Behavior,* 42**,** 659-692.

KLATTE, M., LACHMANN, T. & MEIS, M. 2010b. Effects of noise and reverberation on speech perception and listening comprehension of children and adults in a classroom-like setting. *Noise and Health,* 12**,** 270.

KLINE, R. B. 2004. Beyond significance testing: Reforming data analysis methods in behavioral research. *American Psychological Association.*

KNIGHT, G. R. 2008. Issues and Alternatives in Educational Philosophy, Andrews University Press.

KNOWLES, M. S., HOLTON III, E. F. & SWANSON, R. A. 2011. The adult learner: The definitive classic in adult education and human resource development, Butterworth-Heinemann.

KOPEC, D. 2006. Environmental psychology for design, New York,, Fairchild Publication, INC.

KUROPATWA, D. 2012`. The Difference Between Curriculum and Pedagogy. Available: http://adifference.blogspot.co.uk/2012/01/difference-between-curriculum-and.html [Accessed 2/07/2013].

KUWAIT PETROLEUM CORPORATION. 2016. *Our History* [Online]. Kuwait: KPC. Available: https://www.kpc.com.kw/ar/InformationCenter/Pages/Kuwait-Oil-History.aspx [Accessed June 2016].

LACKNEY, J. A. 1994. Educational Facilities: The Impact and Role of the Physical Environment of the School on Teaching, Learning and Educational Outcomes, ERIC.

LACKNEY, J. A. 2000. Thirty-Three Educational Design Principles for Schools & Community Learning Centers, ERIC Clearinghouse.

LANG, D. 1996. Essential criteria for an ideal learning environment. *Center for Environment, Education and Design Studies, University of Washington.*

LAROCHELLE, M., BEDNARZ, N. & GARRISON, J. W. 1998. Constructivism and education, Cambridge University Press.

LAROCQUE, M. 2008. Assessing perceptions of the environment in elementary classrooms: The link with achievement. *Educational Psychology in Practice,* 24**,** 289-305.

LARSEN-FREEMAN, D. 2000. Second language acquisition and applied linguistics. *Annual Review of Applied Linguistics,* 20**,** 165-181.

LAVOIE, R. 2008. The motivation breakthrough: 6 secrets to turning on the tuned-out child, Simon and Schuster.

LAWSON, B. 2012. Language of space, Routledge.

LEE, S. & CHO, K. The Relations between Physical Environment and Psychosocial Environment: Literature Review. Society for Information Technology & Teacher Education International Conference, 2013. 685-690.

LEWCOCK, R. B. 1978. Traditional architecture in Kuwait and the northern Gulf, Art and Archaeology Research Papers.

LILLARD, A. S. 2005. Montessori: The science behind the genius, Oxford University Press, USA.

LIM, F., O'HALLORAN, K. & PODLASOV, A. 2012. Spatial pedagogy: Mapping meanings in the use of classroom space. *Cambridge Journal of Education,* 42**,** 235-251.

LIPPMAN, P. 2010a. Can the Physical Environment Have an Impact on the Learning Environment?, CELE Exchange, Centre for Effective Learning Environments.

LIPPMAN, P. C. 2010b. Evidence-based design of elementary and secondary schools: A responsive approach to creating learning environments, John Wiley & Sons.

LONG, M., WOOD, C., LITTLETON, K. & PASSENGER, T. 2011. The Psychology of Education 2nd edition, RoutledgeFalmer.

LUBELL, K. M. & VETTER, J. B. 2006. Suicide and youth violence prevention: The promise of an integrated approach. *Aggression and violent behavior,* 11**,** 167-175.

M.O.E 2008. The National Report Development of Education in the State of Kuwait 2004-2008. Kuwait: Ministry of Education.

MAHGOUB, Y. 2004. Globalization and the built environment in Kuwait. *Habitat International,* 28**,** 505-519.

MAHGOUB, Y. 2008. THE IMAPCT OF WAR ON THE MEANING OF ARCHITECTURE IN KUWAIT (Yasser Mahgoub). *International Journal of Architectural Research: ArchNet-IJAR,* 2**,** 232-246.

MAHGOUB, Y. 2009. SOCIO-CULTURAL SUSTAINABILITY OF FUTURE LEARNING ENVIRONMENTS: The Case of the New Kuwait University Campus. *Open House International,* 34.

MAHMEED, T. 2007. Kuwait architecture and design: An investigation of factors influencing design identity.

MAHNKE, F. 1996. Color, environment, and human response. *Detroit: Van Nostrand Reinhold.*

MARK, J. J. 2009. *Mesopotamia* [Online]. Ancient History Encyclopedia Available: http://www.ancient.eu/Mesopotamia/ [Accessed June 2016].

MARKUS, H. & ZAJONC, R. B. 1985. The cognitive perspective in social psychology. *Handbook of social psychology,* 1**,** 137-230.

MARR, D. & VISION, A. 1982. A computational investigation into the human representation and processing of visual information. *WH San Francisco: Freeman and Company*.

MARSCHALL, M. 2006. Parent Involvement and Educational Outcomes for Latino Students. *Review of Policy Research,* 23**,** 1053-1076.

MARTIN, S. H. 2004. Environment-behaviour studies in the classroom. *Journal of Design & Technology Education,* 9.

MARTIN, S. H., SPENCER, C. & BLADES, M. 2006. The classroom environment and children's performance – is there a relationship? Children and their Environments, Cambridge University Press.

MARTINEZ-PONS, M. 2001. Psychology of Teaching and Learning: A Three Step Approach, Bloomsbury Academic.

MASSARO, D. W. & COWAN, N. 1993. Information processing models: Microscopes of the mind. *Annual Review of Psychology,* 44**,** 383-425.

MATHESON, D. 2014. An Introduction to the study of education, Routledge.

MATHESON, D. & GROSVENOR, I. 1999. An Introduction to the Study of Education, David Fulton.

MAXWELL, L. E. 2000. A safe and welcoming school: What students, teachers, and parents think. *Journal of Architectural and Planning Research***,** 271-282.

MAXWELL, L. E. 2010. Chaos outside the home: The school environment. *In:* EVANS, G. W. & WACHS, T. D. (eds.) *Chaos and its influence on children's development: An ecological perspective.*: American Psychological Association.

MCDONALD, E. 1960. Effect of school environment on teacher and student performance. *Air conditioning, Heating, and Ventilation,* 57**,** 78-79.

MCGONIGAL, J. A. 1999. Constructing a learning environment that scaffolds science inquiry in first grade. *Learning Environments Research,* 2**,** 21-41.

MCGUFFEY, C. 1982. Facilities. *Improving educational standards and productivity: The research basis for policy***,** 237-288.

MCGUIGAN, J. 2002. The public sphere. *The Uses of Sociology. Oxford: Blackwell***,** 81-128.

MCINTYRE, M. H. 2006. A literature review of the social, economic and environmental impact of architecture and design, Scottish Executive Social Research.

MCNEILL, L. H., KREUTER, M. W. & SUBRAMANIAN, S. V. 2006. Social Environment and Physical activity: A review of concepts and evidence. *Social Science & Medicine,* 63**,** 1011-1022.

MEAD, G. H. 1934. Mind, self, and society: From the standpoint of a social behaviorist (Works of George Herbert Mead, Vol. 1).

MEIGHAN, R., HARBER, C., BARTON, L., SIRAJ-BLATCHFORD, I. & WALKER, S. 2007. A sociology of educating, Bloomsbury Publishing.

MERCER, N. 2000. Words and minds: How we use language to think together, Psychology Press.

MERO-TSK. 2007. *THE Avenues – Phase I & II, Kuwait* [Online]. Germany: MERO-TSK International GmbH & Co. KG. Available: http://www.mero.de/index.php/en/construction-systems/references-en/36-space-structures/731-the-avenues-kuwait-en.

MINISTRY OF EDUCATION. 2016. *History of Education* [Online]. Ministry of Education Available: http://www.moe.edu.kw/about/Pages/History.aspx [Accessed July 2016].

MINISTY OF EDUCATION 2011. Educational Statistical Group 2010-2011. *In:* DEPARTMENT, P. A. I. (ed.). Kuwait: Ministy of Education.

MITRA, S. July 2010. The child-driven education. April 2014 2010. 2010: TED Conference.

MOHOLY-NAGY, L. 1947. Vision in motion, P. Theobald.

MOLES, O. C. 1989. Strategies To Reduce Student Misbehavior.

MOORE, G. T. & LACKNEY, J. A. 1993. School design: crisis, educational performance and design applications. *Children's Environments*, 99-112.

MOORE, G. T., SUGIYAMA, T. & O'DONNELL, L. Children's physical environments rating scale. Children: The core of society, Proceedings of the Australian Early Childhood Association biennial conference, 2003. 73-81.

MOORE, T. W. 2010. Philosophy of Education (International Library of the Philosophy of Education Volume 14): An Introduction, Taylor & Francis.

MORE, A. J. & HUGHES, P. 1997. Aboriginal Ways of Learning and Learning Styles. *the Annual Conference of the Australian Association for Research in Education.* Brisbane: Australian Association for Research in Education.

MORGAN, D. L. 2007. Paradigms lost and pragmatism regained methodological implications of combining qualitative and quantitative methods. *Journal of mixed methods research,* 1, 48-76.

MORTIMORE, P. 1999. Understanding pedagogy and its impact on learning, London, Paul Chapman Ltd.

MOYLES, J., HARGREAVES, L. & MERRY, R. 2003. Interactive Teaching In The Primary School: Digging Deeper into Meanings, Open University.

MYERS, A. & ANDERSON, S. 2010. How teacher positioning in the classroom affects the on-task behavior of students. *E-Journal of Student Research,* 2, 1-9.

NEUMAN, W. L. 2005. Social research methods: Quantitative and qualitative approaches, Allyn and bacon Boston, MA.

NEWTON, C., WILKS, S. & HES, D. 2009. EDUCATIONAL BUILDINGS AS 3D TEXT BOOKS: Linking ecological sustainability, pedagogy and space. *OPEN HOUSE INTERNATIONAL,* 34, 17-25.

OECD 2009. Creating effective teaching and learning environments: First results from TALIS, Paris, Organisation for Economic Co-operation Development (OECD).

OSTROSKY, M. M. & MEADAN, H. 2010. Helping children play and learn together. *YC Young Children,* 65, 104.

PAPALIA, A. 1994. Planning for effective teaching: Papalia's Classroom Settings. *Mosaic,* 1.

PARTRICK, N. 2009. Nationalism in the Gulf states. *The transformation of the Gulf: Politics, economics and the global order*.

PATRICK, H. & RYAN, A. M. 2003. Identifying adaptive classrooms: Analyses of measures of dimensions of the classroom social environment. *Positive Outcomes Conference.*

PEARLMAN, B. 2010. Designing new learning environments to support 21st century skills. *21st century skills: Rethinking how students learn*, 116-147.

PETER, C. L. & JANINE, B. 2013. Early Learning Centers: Creating Vehicles of Transformation. *Early Childhood Education Design Conference.* EIW Architects.

PETERS, R. 2003. What is an educational process? *Adult and Continuing Education: Adult education-viewed from the disciplines,* 5**,** 7.

PETERS, R. S. 1966. Ethics and education, Scott, Foresman.

PIAGET, J. & INHELDER, B. 1969. The psychology of the child, Basic Books.

PILMAN, M. S. 2001. The effects of air temperature variance on memory ability. *Loyola University Clearinghouse*.

PLOTKA, E. 2016. Better spaces for learning. London: RIBA Architecture.

POWELL, C. Kids need structure. 2012 TEDxMidAtlantic.

PPRC. 2001. Sustainable Design for Schools.

PROSHANSKY, E. & WOLFE, M. 1974. The physical setting and open education. *The School Review,* 82**,** 557-574.

PUNCH, K. F. 2014. Introduction to social research: Quantitative and qualitative approaches, Sage.

QUN ZUO, W. L., EILEEN E. MALONEBEACH, 2010. Integrating performance-based design in beginning interior design education: an interactive dialog between the built environment and its context. *Design Studies* 31 (2010) 268-287.

RAYNOR, J. 1972. The Curriculum in England. *Milton Keynes: Open University Press. A more complex attempt*.

READ, M. A., SUGAWARA, A. I. & BRANDT, J. A. 1999. Impact of space and color in the physical environment on preschool children's cooperative behavior. *Environment and Behavior,* 31**,** 413-428.

ROBERTS, L. W. 2009. Measuring school facility conditions: an illustration of the importance of purpose. *Journal of Educational Administration,* 47**,** 368-380.

ROBINSON, K. Do schools kill creativity. Presentation at TED2006 conference, Monterey, CA, 2006.

ROBINSON, K. 2011. Out of our minds: Learning to be creative, John Wiley & Sons.

ROBSON, C. 2011. Real world research: a resource for users of social research methods in applied settings, Chichester, Wiley.

ROESER, R. W., MIDGLEY, C. & URDAN, T. C. 1996. Perceptions of the school psychological environment and early adolescents' psychological and behavioral functioning in school: The mediating role of goals and belonging. *Journal of Educational Psychology,* 88**,** 408.

ROSSMAN, G. B. & WILSON, B. L. 1985. Numbers and words combining quantitative and qualitative methods in a single large-scale evaluation study. *Evaluation review,* 9**,** 627-643.

ROWNTREE, D. 1998. Learn how to study: A realistic approach, Warner books.

RUTTER, M. 1979. Fifteen thousand hours: secondary schools and their effects on children, London, Open Books.

SAELENS, B. E. & HANDY, S. L. 2008. Built Environment Correlates of Walking: A Review. *Medicine and science in sports and exercise,* 40**,** S550-S566.

SALAMA, A. M. 2009. A bright future for creating environments conducive to learning. *open house international,* 34**,** 5-8.

SALLIS, J., BAUMAN, A. & PRATT, M. 1998. Environmental and policy interventions to promote physical activity. *American journal of preventive medicine,* 15**,** 379-397.

SANOFF, H. 2001. School Building Assessment Methods.

SAUNDERS, M. N., SAUNDERS, M., LEWIS, P. & THORNHILL, A. 2011. Research methods for business students, 5/e, Pearson Education India.

SCHWAB, K. (ed.) 2016. *The Global Competitiveness Report 2016–2017*: The World Economic Forum.

SCHWARTZ, T., WHITE, G. M. & LUTZ, C. A. 1992. New directions in psychological anthropology, Cambridge University Press.

SCHWEBEL, A. I. & CHERLIN, D. L. 1972. Physical and social distancing in teacher-pupil relationships. *Journal of Educational Psychology,* 63**,** 543.

SHIELD, B. & DOCKRELL, J. E. 2004. External and internal noise surveys of London primary schools. *The Journal of the Acoustical Society of America,* 115**,** 730-738.

SIMMONS, K., CARPENTER, L., CRENSHAW, S. & HINTON, V. M. 2015. Exploration of Classroom Seating Arrangement and Student Behavior in a Second Grade Classroom. *Georgia Educational Researcher,* 12**,** 51.

SKINNER, B. F. 1953. Science and human behavior, New York, Macmillan.

SLEEMAN, P. J. & ROCKWELL, D. 1981. Designing learning environments, Longman Publishing Group.

SLOT, B. 1991. The Origins of Kuwait, New York.

SMITH, M. K. 2003a. 'Donald Schön: learning, reflection and change'. The encyclopedia of informal education. Available: www.infed.org/thinkers/et-schon.htm [Accessed Nov/2012].

SMITH, M. K. 2003b. Learning theory'. Available: http://www.infed.org/biblio/b-learn.htm [Accessed 26/10/2012].

SOANES, C. 2002. *Compact Oxford English Dictionary of Current English* [Online]. Oxford University Press. Available: http://books.google.co.uk/books?id=K5ugQgAACAAJ [Accessed 1 October 2014].

SORRELL, J. & SORRELL, F. 2005. Joined up design for schools, Merrell London/New York.

STEELE, F. I. 1973. Physical settings and organization development, Addison-Wesley Reading, MA.

STRONG-WILSON, T. & ELLIS, J. 2007. Children and Place: Reggio Emilia's Environment As Third Teacher. *Theory Into Practice,* 46**,** 40-47.

STUDIES AND RESEARCH SECTOR 2013. Survey Results: The priorities of the Kuwaiti citizens. Kuwait: Kuwait National Assembly.

SULEMAN, Q. & HUSSAIN, I. 2014. Effects of classroom physical environment on the academic achievement scores of secondary school students in kohat division, Pakistan. *International Journal of Learning and Development,* 4**,** 71-82.

TAYLOR, A. P. & ENGGASS, K. 2009. Linking architecture and education: sustainable design for learning environments, Albuquerque, University of New Mexico Press.

TEDDLIE, C. & TASHAKKORI, A. 2003. Major issues and controveries inthe use of mixed methods in the social and behvioral sciences. *Handbook of mixed methods in social & behavioral research***,** 3-50.

TELI, D., JENTSCH, M. F. & JAMES, P. A. B. 2012. Naturally ventilated classrooms: An assessment of existing comfort models for predicting the thermal sensation and preference of primary school children. *Energy and Buildings*.

TESTER, J. M. 2009. The built environment: designing communities to promote physical activity in children. *Pediatrics,* 123**,** 1591-1598.

THARP, R. G. & GALLIMORE, R. 1988. Rousing minds to life. Cambridge: Cambridge University Press.

THEYAB, J. 2010. The Genetic Structure of the Kuwaiti Population: Mitochondrial DNA Markers. University of Kansas.

THORNDYKE, P. W. 1977. Cognitive structures in comprehension and memory of narrative discourse. *Cognitive psychology,* 9**,** 77-110.

TINTO, V. 1997. Classrooms as Communities: Exploring the Educational Character of Student Persistence. *Journal of Higher Education,* 68**,** 599-623.

TOLMAN, E. C. 1948. Cognitive maps in rats and men. *Psychological review,* 55**,** 189.

TOMLINSON, C. A. 2004. The Differentiated Classroom: Responding to the Needs of All Learners, Pearson Education.

TRANCIK, A. M. & EVANS, G. W. 1995. Spaces fit for children: Competency in the design of daycare center environments. *Children's Environments***,** 311-319.

TULVING, E. 1985. How many memory systems are there? *American psychologist,* 40**,** 385.

ULINE, C. L. 2000. Decent Facilities and Learning: Thirman A. Milner Elementary School and Beyond. *Teachers College Record,* 102**,** 442-60.

VEIGA, F. H. 2001. Students' perceptions of their rights in Portugal. *School Psychology International,* 22**,** 174-189.

VELTRI, S., BANNING, J. H. & DAVIES, T. G. 2006. The community college classroom environment: student perceptions. *College Student Journal,* 40**,** 517.

VON GLASERSFELD, E. 1989a. Constructivism in education.

VON GLASERSFELD, E. 1989b. Knowing without Metaphysics: Aspects of the Radical Constructivist Position.

VYGOTSKY, L. S. 1978. Mind and society: The development of higher mental processes. Cambridge, MA: Harvard University Press.

WALLIMAN, N. 2005. Your research project: a step-by-step guide for the first-time researcher, Sage.

WALLIMAN, N. 2010. Research methods: The basics, Routledge.

WALTER, E. 2008. Cambridge advanced learner's dictionary, Ernst Klett Sprachen.

WANNARKA, R. & RUHL, K. 2008. Seating Arrangements that Promote Positive Academic and Behavioural Outcomes: A Review of Empirical Research. *Support for Learning,* 23**,** 89-93.

WARD, L. A. 2011. *Philosophical allurements: Education and argument in ancient philosophy.* Duke University.

WATAN-ALNAHAR 2012. Historical buidlings. Kuwait: Ministry of Media

WEBSTER, M. 2006. Merriam-Webster online dictionary.

WEINER, B. 1985. Drive Theory. *Human Motivation.* Springer.

WEINSTEIN, C. S. & DAVID, T. G. 1987. Spaces for children: the built environment and child development, Plenum Press.

WEINSTEIN, N. D. & WEINSTEIN, C. S. 1979. Noise and reading performance in an open space school. *The Journal of Educational Research,* 72**,** 210-213.

WEISS, A. 2007. Creating the Ubiquitous Classroom: Integrating Physical and Virtual Learning Spaces. *International journal of Learning,* 14.

WHITTY, G. 2006. Education (al) research and education policy making: is conflict inevitable? *British Educational Research Journal,* 32**,** 159-176.

WILKS, D. S. 2010. A Charter for Children's Learning at The Royal Children's Hospital, literature review, Melbourne, Royal Children's Hospital Education Institute.

WILLIAMS, C. 2013. *An Ad Agency's Seriously Surprising New Office Space.*

WILMSHURST, L. 2005. Essentials of child psychopathology, John Wiley & Sons.

WINTERBOTTOM, M. & WILKINS, A. 2009. Lighting and discomfort in the classroom. *Journal of Environmental Psychology,* 29**,** 63-75.

WITTROCK, M. C. 1992. Generative learning processes of the brain. *Educational Psychologist,* 27**,** 531-541.

WOLFF, S. J. 2003. Design Features of the Physical Learning Environment for Collaborative, Project-Based Learning at the Community College Level. *National Research Centre for Career and Technical Education*.

WOODS, R. & BARROW, R. 2006. An introduction to philosophy of education, Routledge.

WORLD WEATHER INFORMATION SERVICE. 2012. *Kuwait City* [Online]. World Meteorological Organization. Available: http://worldweather.wmo.int/113/c01498.htm [Accessed 15 Nov 2013].

YERO, J. L. 2002. Teaching in Mind: How Teacher Thinking Shapes Education. *Hamilton, Montana* [Online], Mind-Flight Publishing.

YIN, R. K. 2014. Case study research: design and methods, Los Angeles, [Calif.], SAGE.

ZUMTOBEL 2013. The lighting handbook. *Chapter 2: Standard Values.* 4th ed. Austria: Zumtobel.

Appendices

Appendix A. The Pilot study questionnaire

School Name: .... Classroom: ....
Date & Time: ....

This study aims to evaluate the effectiveness of school building environments in Kuwaiti public schools. In addition, it aims to assess the impact of the physical environment on students' performance and attitude. This is to understand the requirements deemed essential for maintaining effective school building environments from an architectural and internal design perspective.
I would appreciate it if you could please take a few minutes to respond to the following questions.
Please circle your choice.
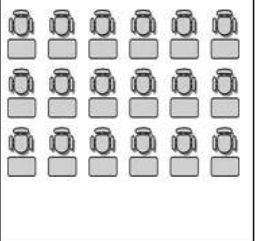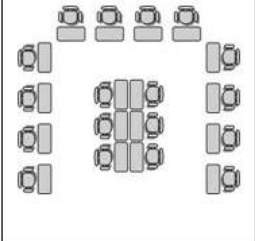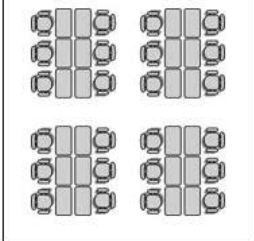
1- What is your assessment of the quality of your classroom design?

    Very Good   Good   Satisfactory   Not appropriate

2- Do you think the learning environment in your school should be changed to better standards?

    Yes   No

3- Does your current school and classroom design support your focus during learning?

    Yes   No

4- Is your current classroom furniture fixed in a particular arrangement all the time?

    Yes   No

5- Is your current classroom furniture flexible depending on the subject and teacher's needs?

    Yes   No

6- Are you satisfied with classroom size and student number?

    Yes   No

7- Do you think the lighting in the classroom is appropriate and encourages you to concentrate in your school?

    Yes   No

8- Do you think the colours used in the classroom are appropriate and encourage you to concentrate in your school?

    Yes   No

9- Do you think the temperature of your classroom is appropriate and makes you feel comfortable at all times?

    Yes   No

10- Do you think that your classroom design should vary depending on the subject of study?

    Yes   No

Please write your notes and concerns for improving the learning environment in your school:
....
....
....

Thank you for your participation and completing this questionnaire

Appendix B. The physical survey checklists

Date / Time: _____ Physical SURVEY INSTRUMENT

School Name: _____ Class: _____

❖ **Structural & Building Condition checklists:**

- Building Age: _____ Total School size: _____ SQ Meter
- Total Students capacity: _____ Classrooms (Grades): _____

- Classroom size: - Class _____ : _____ X _____ = _____ SQ Meter -Student density: _____
- Windows size -: _____ : _____ X _____ = _____ SQ Meter
  - Units _____ : _____ X _____ = _____ SQ Meter
  - Units _____ : _____ X _____ = _____ SQ Meter

- Windows Number: _____ Flooring: _____ Roof/Ceiling: _____
- Wall _____ Wall colour: _____
- Thermal: Ventilation: _____ Heating: _____ Air condition: _____
- Locker/ Storage: _____ Location: _____
- Seating Arrangement :

- Classroom Furniture: _____
  - Colour: _____ Materials: _____
- Lighting:

A- Incandescent lighting /

B - Fluorescent lighting-Hot or Cold.

C- Other/ ....

Unit's amount per classroom:
Glare:
Lighting distribution:

- Noise level in classroom: _____ External Noise level: _____
- Aesthetics elements: _____ Wall paint: _____
  Other
- Graffiti: _____ Where: _____
- Cleanness: _____
- Damaged elements: _____

_____

Appendix C. The school facility appraisal

Guide for
School Facility Appraisal

1998 Edition

INSTRUMENT FOR MIDDLE SCHOOL APPRAISAL

by

Harold L. Hawkins, Ed.D.

and

H. Edward Lilley, Ph.D.
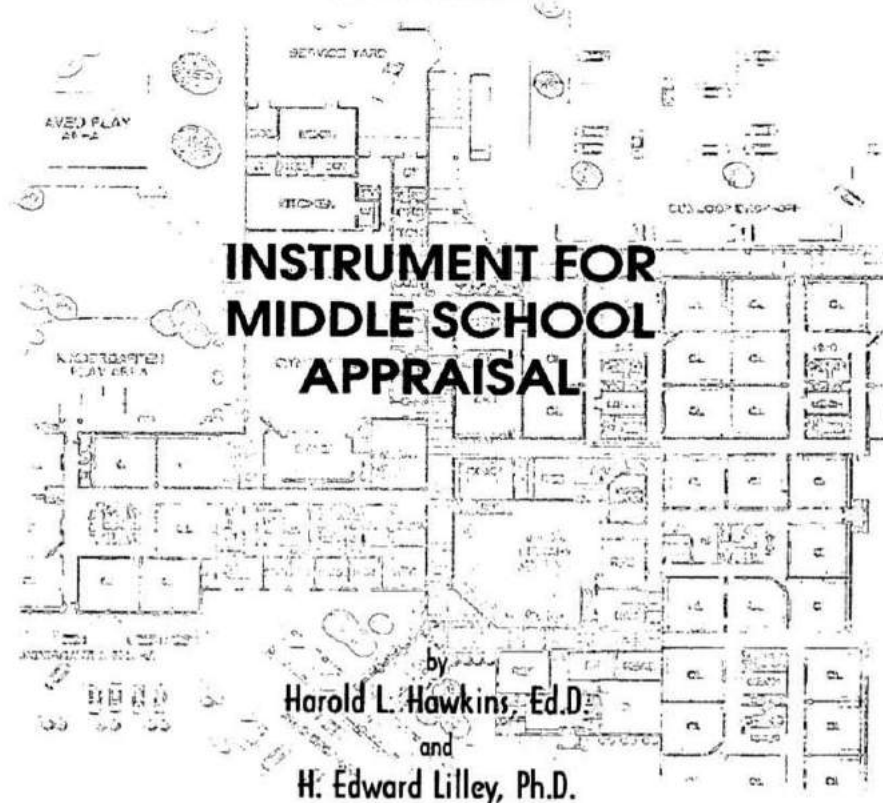
74

The Council of Educational Facility Planners, International

Directions for Appraising Facilities

Middle School Appraisal

Prior to evaluating a building, the appraiser should become familiar with the educational program provided within the existing school facility. It is essential also to determine other pertinent factors about the facility which will provide background information sufficient to insure a thorough and accurate appraisal. Particularly helpful are the building's architectural plans, specifications and layout, if these are available. If possible, the school plant should be appraised at a time when school is in session so that the actual use of the building is more apparent.

Although the Appraisal Guide is designed for individual appraiser use, ideally the school facility should be evaluated at the same time by three to five appraisers. The ratings by each of the appraisers should then be used to arrive at a consensus for each item. The final rating is the result of careful review of the individual scores.

The instrument uses an additive scoring method, with each item having a maximum number of allowable points. A total of 1000 points is distributed among these six major categories:

Section		Maximum Points
1.0	The School Site	100
2.0	Structural and Mechanical Features	200
3.0	Plant Maintainability	100
4.0	School Building Safety and Security	200
5.0	Educational Adequacy	200
6.0	Environment for Education	200

Prior to Appraisal

Step I

Review the educational program; identify the number of faculty members and students; and examine the floor and plot plans carefully.

Overview of the Building and Grounds

Step II

Upon approach to the site look for traffic patterns, school safety signs, neighborhood environment, etc. Begin the appraisal by taking a preliminary tour of the entire building noting both exterior and interior features. Information obtained prior to arrival at the campus recorded in the Building Data Record should be verified. The appraisal weights should not be determined during this initial walk through. The appraisal is better accomplished as separate individual steps in the process.

Assignment of Scores

Step III

After the completion of the preliminary inspection, go through the entire instrument section by section. The appraisal will be more accurate if each item is carefully considered while it is appropriately observed. **Do not try to evaluate from memory** — use actual observation when making the appraisal decision.

Items that are needed/required but are non-existent should be given a 0 score. If an item is not needed and is non-existent full credit should be allowed.

Note the Table of Weights for assistance in determining the score to be given each item. Each item should first be considered in the following terms: Non-Existent, Very Inadequate, Poor, Borderline, Satisfactory, and Excellent. The weight (score) should then be assigned for that item.

Place score in space provided in the Points Allotted Column, total the score for each Section and insert in the space provided. The Section totals should then be tabulated and indicated in the Points Assigned column of the Appraisal Summary. Use the space provided in the Justification for Allocation of Points to provide notes justifying the scores at the extreme ends of the scale (e.g. very inadequate, or excellent.)

Building Data Record

Name of Appraiser	_____ Date of Appraisal _____
Building Name	_____
Street Address	_____
City/Town, State, Zip Code	_____
Telephone Number(s)	_____
School District	_____

Setting:
☐ Urban   ☐ Suburban   ☐ Small City   ☐ Rural

Site-Acreage_____   Building Square Footage_____

Grades Housed _____   Student Capacity _____

Number of Teaching Stations_____   Number of Floors _____

Student Enrollment_____   As Of _____

Dates of Construction_____

Energy Sources:
☐ Fuel Oil   ☐ Gas   ☐ Electric   ☐ Solar

Air Conditioning:
☐ Roof Top   ☐ Window Units   ☐ Central   ☐ Room Units

Heating:
☐ Central   ☐ Roof Top   ☐ Room Units
☐ Forced Air   ☐ Steam   ☐ Hot Water

Type of Construction:
☐ Load Bearing Masonry   ☐ Steel Frame   ☐ Concrete Frame   ☐ Wood
☐ Other _____

Exterior Surfacing:
☐ Brick   ☐ Stucco   ☐ Metal   ☐ Wood
☐ Other _____

Floor Construction:
☐ Wood Joists   ☐ Steel Joists   ☐ Slab on Grade   ☐ Structural Slab
☐ Other _____

The Council of Educational Facility Planners, International

Appraisal Guide for School Facilities

Table of Weights and Categories

	Maximum Points Allotted	Non-Existent	Very Inadequate 1-29%	Poor 30-49%	Borderline 50-69%	Satisfactory 70-89%	Excellent 90-100%
	5	0	1	2	3	4	5
	10	0	2	4	6	8	10
	15	0	3	6	9	12	15
	20	0	4	8	12	16	20
	25	0	5	10	15	20	25

Appraisal Summary

SECTION	POSSIBLE POINTS	TOTAL EARNED	PERCENT	RATING BY CATEGORY
1.0 The School Site	100			
2.0 Structural and Mechanical	200			
3.0 Plant Maintainability	100			
4.0 School Building Safety & Security	200			
5.0 Educational Adequacy	200			
6.0 Environment for Education	200			
TOTAL	1,000			

Appendices   334

1.0 The School Site

100 Points

1.1 **Site is large enough** to meet present and future educational needs as defined by state and local requirements. | 25 | |

1.2 **Site is easily accessible** and conveniently located for the present and future population. | 20 | |

1.3 **Location** is removed from undesirable business, industry, traffic, and natural hazards. | 10 | |

1.4 Site is **well landscaped and developed** to meet educational needs. | 10 | |

1.5 Well equipped **athletic and intramural areas are separated** from streets and parking areas. | 10 | |

1.6 **Topography** is varied enough to provide desirable appearance and without steep inclines. | 5 | |

1.7 Site has stable, well drained **soil free of erosion**. | 5 | |

1.8 Site is suitable for **special instructional needs**, e.g. outdoor learning. | 5 | |

1.9 **Pedestrian services** include adequate sidewalks with designated cross-walks, curb cuts, and correct slopes. | 5 | |

1.10 Sufficient **on-site, solid surface parking** is provided for faculty, staff and community. | 5 | |

TOTAL — THE SCHOOL SITE | 100 | |

Table of Weights and Categories

Maximum Points Allotted	Non-Existent	Very Inadequate 1-29%	Poor 30-49%	Borderline 50-69%	Satisfactory 70-89%	Excellent 90-100%
5	0	1	2	3	4	5
10	0	2	4	6	8	10
20	0	4	8	12	16	20
25	0	5	10	15	20	25

78   The Council of Educational Facility Planners. International

Appendices   335

2.0 Structural and Mechanical Features

200 Points

STRUCTURAL

2.1   Structure meets all **barrier-free** requirements both externally and internally. | 15 | |

2.2   **Roofs** appear sound, have positive drainage, and are weather tight. | 15 | |

2.3   **Foundations** are strong and stable with no observable cracks. | 10 | |

2.4   **Exterior and interior walls** have sufficient expansion joints and are free of deterioration. | 10 | |

2.5   **Entrances and exits** are located so as to permit efficient student traffic flow. | 10 | |

2.6   **Building "envelope"** generally provides for energy conservation. (See criteria) | 10 | |

2.7   Structure is **free of friable asbestos** and **toxic materials**. | 10 | |

2.8   Interior walls permit sufficient **flexibility** for a variety of class sizes. | 10 | |

Table of Weights and Categories

Maximum Points Allotted	Non-Existent	Very Inadequate 1-29%	Poor 30-49%	Borderline 50-69%	Satisfactory 70-89%	Excellent 90-100%
10	0	2	4	6	8	10
15	0	3	6	9	12	15

Appendices   336

MECHANICAL/ELECTRICAL

2.9 **Adequate light sources** are well maintained, properly placed and are not subject to overheating.

15 ▢

2.10 **Internal water supply** is adequate with sufficient pressure to meet health and safety requirements.

15 ▢

2.11 Each teaching/learning area has adequate convenient **wall outlets**, phone and computer cabling for **technology applications.**

15 ▢

2.12 **Electrical controls** are safely protected with **disconnect switches** easily accessible.

10 ▢

2.13 **Drinking fountains** are adequate in number and placement, and are properly maintained including provisions for the disabled.

10 ▢

2.14 Number and size of **restrooms meet requirements.**

10 ▢

2.15 **Drainage systems** are properly maintained and meet requirements.

10 ▢

2.16 **Fire alarms, smoke detectors, and sprinkler systems** are properly maintained and meet requirements.

10 ▢

2.17 **Intercommunication system** consists of a central unit that allows dependable **two-way communication** between the office and instructional areas.

10 ▢

2.18 **Exterior water supply** is sufficient and available for normal usage.

5 ▢

TOTAL — STRUCTURAL AND MECHANICAL FEATURES

200 ▢

Table of Weights and Categories	Maximum Points Allotted	Non-Existent	Very Inadequate 1-29%	Poor 30-49%	Borderline 50-69%	Satisfactory 70-89%	Excellent 90-100%
	5	0	1	2	3	4	5
	10	0	2	4	6	8	10
	15	0	3	6	9	12	15

3.0   Plant Maintainability

100 Points

3.1   **Exterior windows, doors, and walls** are of material and finish requiring minimum maintenance. | 15 | |

3.2   **Floor surfaces** throughout the building require minimum care. | 15 | |

3.3   **Ceilings and walls** throughout the building, including service areas, are easily cleaned and resistant to stain. | 10 | |

3.4   **Built-in equipment** is designed and constructed for ease of maintenance. | 10 | |

3.5   **Finishes and hardware**, with a compatible keying system, are of durable quality. | 10 | |

3.6   **Restroom fixtures** are wall mounted and of quality finish. | 10 | |

3.7   Adequate **custodial storage space** with water and drain is accessible throughout the building. | 10 | |

3.8   Adequate **electrical outlets and power**, to permit routine cleaning, are available in every area. | 10 | |

3.9   **Outdoor light fixtures, electric outlets**, equipment, and other fixtures are accessible for repair and replacement. | 10 | |

TOTAL — PLANT MAINTAINABILITY

| 100 | |

Table of Weights and Categories

Maximum Points Allotted	Non-Existent	Very Inadequate 1-29%	Poor 30-49%	Borderline 50-69%	Satisfactory 70-89%	Excellent 90-100%
10	0	2	4	6	8	10
15	0	3	6	9	12	15

4.0   Building Safety and Security

200 Points

SITE SAFETY

4.1   **Student loading areas** are segregated from other vehicular traffic and pedestrian walkways. | 15 | |

4.2   **Walkways,** both on and offsite, are available for safety of pedestrians. | 10 | |

4.3   **Access streets** have sufficient signals and signs to permit safe entrance to and exit from school area. | 5 | |

4.4   **Vehicular entrances and exits** permit safe traffic flow. | 5 | |

4.5   Locations and types of **intramural equipment** are free from hazard. | 5 | |

BUILDING SAFETY

4.6   The **heating unit(s)** is located away from student occupied areas. | 20 | |

4.7   Multi-story buildings have at least **two stairways** for student egress. | 15 | |

4.8   **Exterior doors** open outward and are equipped with panic hardware. | 10 | |

4.9   **Emergency lighting** is provided throughout the building with exit signs on separate electrical circuits. | 10 | |

4.10   **Classroom doors** are recessed and open outward. | 10 | |

4.11   **Building security systems** are provided to assure uninterrupted operation of the educational program. | 10 | |

Table of Weights and Categories

Maximum Points Allotted	Non-Existent	Very Inadequate 1-29%	Poor 30-49%	Borderline 50-69%	Satisfactory 70-89%	Excellent 90-100%
5	0	1	2	3	4	5
10	0	2	4	6	8	10
15	0	3	6	9	12	15
20	0	4	8	12	16	20

4.12   **Flooring** (including ramps and stairways) is maintained in a nonslip condition. | 5 |

4.13   **Stairs** (interior and exterior) meet standards (maximum 7"rise to 11" tread) and steps range in number from 3 - 16. | 5 |

4.14   **Glass** is properly located and protected with wire or safety material to prevent accidental student injury. | 5 |

4.15   **Fixed projections** in the traffic areas do not extend more than eight inches from the corridor wall. | 5 |

4.16   **Traffic areas** terminate at an exit or a stairway leading to an egress. | 5 |

EMERGENCY SAFETY

4.17   Adequate **fire safety equipment** is properly located. | 15 |

4.18   There are at least **two independent exits** from any point in the building. | 15 |

4.19   **Fire-resistant materials** are used throughout the structure. | 15 |

4.20   Automatic and manual **emergency alarm system** with a distinctive sound and flashing light is provided. | 15 |

TOTAL — BUILDING SAFETY AND SECURIY | 200 |

Table of Weights and Categories	Maximum Poish Allotted	Non-Existent	Very Inadequate 1-29%	Poor 30-49%	Borderline 50-69%	Satisfactory 70-89%	Excellent 90-100%
	5	0	1	2	3	4	5
	15	0	3	6	9	12	15

· 83   The Council of Educational Facility Planners. International

Appendices   340

5.0 Educational Adequacy

<div align="right">200 Points</div>

ACADEMIC LEARNING SPACE

5.1 **Size of academic learning areas** meets desirable standards.
<div align="right">15</div>

5.2 **Classroom space** permits arrangements for small group activity.
<div align="right">10</div>

5.3 **Location of academic learning areas** is near related educational activities and away from disruptive noises.
<div align="right">10</div>

5.4 **Personal space** in the classroom away from group instruction allows privacy time for individual students.
<div align="right">5</div>

5.5 **Storage for student materials** is adequate.
<div align="right">5</div>

5.6 **Storage for teacher materials** is adequate.
<div align="right">5</div>

SPECIALIZED LEARNING SPACE

5.7 **Size of specialized learning area(s)** meets standards.
<div align="right">15</div>

5.8 **Design of specialized learning area(s)** is compatible with instructional need.
<div align="right">10</div>

5.9 **Library/Resource/Media Center** provides appropriate and attractive space.
<div align="right">15</div>

5.10 **Gymnasium and outdoor facilities** adequately serve physical education instruction.
<div align="right">10</div>

5.11 **Science** program is provided sufficent space and equipment.
<div align="right">10</div>

5.12 **Music Program** is provided adequate sound-treated space.
<div align="right">10</div>

Table of Weights and Categories

Maximum Points Allotted	Non-Existent	Very Inadequate 1-29%	Poor 30-49%	Borderline 50-69%	Satisfactory 70-89%	Excellent 90-100%
5	0	1	2	3	4	5
10	0	2	4	6	8	10
15	0	3	6	9	12	15
25	0	5	10	15	20	25

5.13 **Space for art** is appropriate for instruction, supplies, and equipment. | 10 | [ ]

5.14 **Space for technology education** permits use of state-of-the-art equipment. | 10 | [ ]

5.15 Space for **small groups and remedial instruction** is provided adjacent to classrooms. | 5 | [ ]

5.16 **Storage for student and teacher material** is adequate. | 5 | [ ]

SUPPORT SPACE

5.17 **Teachers' lounge and work areas** support teachers as professionals. | 10 | [ ]

5.18 **Cafeteria/Kitchen** is attractive with sufficient space for seating/dining, delivery, storage, and food preparation. | 10 | [ ]

5.19 **Administrative offices** are consistent in appearance and function with the maturity of the students served. | 10 | [ ]

5.20 **Counselor's office** insures privacy and sufficient storage. | 5 | [ ]

5.21 **Clinic** is near administrative offices and is equipped to meet requirements. | 5 | [ ]

5.22 **Suitable reception space** is available for students, teachers, and visitors. | 5 | [ ]

5.23 **Administrative personnel** are provided sufficient work space and privacy. | 5 | [ ]

TOTAL — EDUCATIONAL ADEQUACY
200 | [ ]

Table of
Weights
and
Categories

Maximum Points Allotted	Non-Existent	Very Inadequate 1-29%	Poor 30-49%	Borderline 50-69%	Satisfactory 70-89%	Excellent 90-100%
5	0	1	2	3	4	5
10	0	2	4	6	8	10

85   The Council of Educational Facility Planners. International

Appendices   342

6.0 Environment for Education

200 Points

EXTERIOR ENVIRONMENT

6.1 Overall **design is aesthetically pleasing** and appropriate for the age of students. | 15 |

6.2 Site and building are **well landscaped**. | 10 |

6.3 **Exterior noise and surrounding environment** do not disrupt learning. | 10 |

6.4 **Entrances and walkways are sheltered** from sun and inclement weather. | 10 |

6.5 **Building materials** provide attractive color and texture. | 5 |

INTERIOR ENVIRONMENT

6.6 **Color schemes, building materials, and decor** provide an impetus to learning. | 20 |

6.7 **Year around comfortable temperature and humidity** are provided throughout the building. | 15 |

6.8 **Ventilating system** provides adequate quiet circulation of clean air and meets 15cfm VBC requirement. | 15 |

6.9 **Lighting system** provides proper intensity, diffusion, and distribution of illumination. | 15 |

6.10 **Sufficient drinking fountains and restroom facilities** are conveniently located. | 15 |

6.11 **Communication** among students is enhanced by commons area. | 10 |

Table of Weights and Categories

Maximum Points Allotted	Non-Existent	Very Inadequate 1-29%	Poor 30-49%	Borderline 50-69%	Satisfactory 70-89%	Excellent 90-100%
5	0	1	2	3	4	5
10	0	2	4	6	8	10
15	0	3	6	9	12	15
20	0	4	8	12	16	20

BEST COPY AVAILABLE

ERIC

86

6.12 **Traffic flow** is aided by appropriate foyers and corridors. | 10 | |

6.13 **Areas for students to interact** are suitable to the age group. | 10 | |

6.14 **Large group areas** are designed for effective management of students. | 10 | |

6.15 **Acoustical treatment** of ceilings, walls, and floors provides effective sound control. | 10 | |

6.16 **Window design** contributes to a pleasant environment. | 10 | |

6.17 **Furniture and equipment** provide a pleasing atmosphere. | 10 | |

TOTAL — ENVIRONMENT FOR EDUCATION | 200 | |

Table of
Weights
and
Categories

Maximum Points Allotted	Non-Existent	Very Inadequate 1-29%	Poor 30-49%	Borderline 50-69%	Satisfactory 70-89%	Excellent 90-100%
10	0	2	4	6	8	10

Appendices 344

Justification for Allocation of Points

BUILDING NAME AND LEVEL:

_____

Indicate the justification for the appraisal decision in the space provided.

BUILDING FEATURES THAT CLEARLY EXCEED CRITERIA:

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

BUILDING FEATURES THAT ARE NON-EXISTENT OR VERY INADEQUATE:

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

DATE OF APPRAISAL: _____

NAME OF SCHOOL : _____

NAME OF APPRAISERS : _____

_____

_____

_____

_____

_____

Appendix D. Observation checklists

Observing the public learning environment in Kuwait:
Date / Time: _____ Class hour: _____

School Name: _____ Class: _____

Students: _____ Attending: _____

1. Description of the physical settings:
    1.1   Seating arrangement:

    1.2   Students' storage:

    1.3   Classroom display :

    1.4   Teachers desk:

    1.5   Noise level:

    1.6   Classroom colour:

    1.7   Flooring material

    1.8   Lighting (natural – bulbs):

    1.9   Temperature:
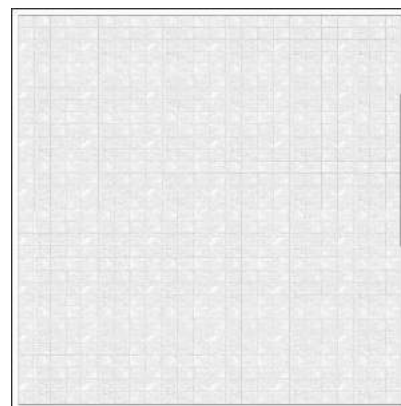
2. Observation of the events/ communication within the physical settings:

    2.1   Seat allocation:

    2.2   Movement:

    2.3   Movement plan (teacher- students):

    2.4   Alternative places and activities provided in the classroom:

    2.5   Resources and teaching aids:

    2.6   Teachers dealing with disruptive students:

    2.7   Type of activity & subject:

    2.8   Expectation of quality of work:

    2.9   Where teacher spent most of the class time:

    2.10   Where students spent most of the class time:

    2.11   Time management of class hour:

    2.12   Other notes:
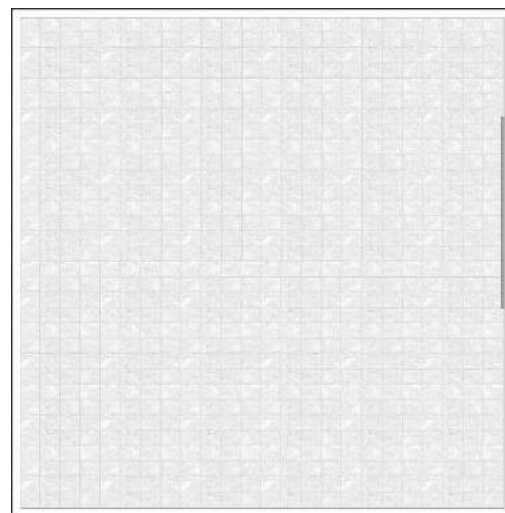
Appendix E. Students questionnaire

Date / Time: ....School Building Attitude Inventory - Student.........
School Name: .... Class: ....

This questionnaire aims to identify your concerns and feedback about your classroom and school environment, in term of the physical space, layout, facilities, technology, and aesthetics. The main purpose of this study is to improve the overall quality of the classroom and school environment. Your participation in this study is important to achieve that objective.

❖ Please circle **Yes** or **No** in response to each of the following statements:

1	I like my school.	Yes	No
2	I like to come to school everyday.	Yes	No
3	My classroom size is appropriate.	Yes	No
4	I like my classroom colour.	Yes	No
5	I have good natural lighting in my classroom.	Yes	No
6	The classroom temperature is good.	Yes	No
7	There are enough lockers in my school.	Yes	No
8	My classroom is comfortable.	Yes	No
9	Our seating arrangement is good and keeps me interacting easily with the teachers.	Yes	No
10	My classroom lighting is good.	Yes	No
11	There no noise in my classroom.	Yes	No
12	My classroom is clean and tidy.	Yes	No
13	My classroom seat is comfortable.	Yes	No
14	My classroom has fresh air.	Yes	No
15	My classroom is in good condition.	Yes	No
16	My classroom has a computer and a projector.	Yes	No
17	Access to the library and school facilities is easy.	Yes	No
18	Access to my school facilities (food hall, faith rooms, sport hall…*etc.*) is easy in my school.	Yes	No
19	I can change my classroom seating arrangement.	Yes	No
20	I know all parts of my school.	Yes	No

❖ Please comment on the factors that need alteration in your opinion in order to enhance your learning experience:

....
....
....
....
....
....
....

Thanks for your cooperation

Appendix F. Teachers' questionnaire

Date / Time: .... School Building Attitude Inventory – Teachers

School Name: .... Teacher of ....

Please circle the most appropriate description according to the scale provided on the right. In response to the following questions, think about your opinion, attitude and concerns regarding school environment and classroom facilities. You may provide additional information at the end of this questionnaire.

	1 – Poor: priority action needed for development 2 – Satisfactory: accept current state but willing to see improvement 3 – Good: pleased with current state as it is 4 – Very good: working successfully and no action required	Very good	Good	Satisfactory	Poor
1	Teachers are treated in accordance with the equal opportunities policy.	4	3	2	1
2	Teachers know the reasons behind the rules in school.	4	3	2	1
3	Teachers support the developing of the learning environment.	4	3	2	1
4	Teachers know what is expected of them in school.	4	3	2	1
5	Parents are routinely informed about their children's behaviour and learning achievements.	4	3	2	1
6	Parents know that their children are learning and behaving well at school.	4	3	2	1
7	Successes and difficulties are shared equally with all teachers and administrators at school and considered well within school rules.	4	3	2	1
8	Teacher and staff roles are clearly defined.	4	3	2	1
9	Teachers know the function of the classroom	4	3	2	1
10	Corridors and stairs are supervised and safe.	4	3	2	1
11	Students and teachers move around the building in an orderly fashion.	4	3	2	1
12	Social areas are designed in school to provide a range of activities and interests for students' development.	4	3	2	1
13	An effective system is in place for the resolution of student's conflicts inside and outside the school.	4	3	2	1
14	The Teaching and Learning Policy is understood by teachers and staff.	4	3	2	1
15	Classrooms are pleasant places to teach.				
16	Lighting is adequate and there is no glare in our classrooms.	4	3	2	1
17	External noise is minimal in our classrooms.	4	3	2	1
18	Teachers have reasonable access to drinking water and toilets.	4	3	2	1
19	There is adequate space for movement in the classroom.	4	3	2	1
20	Furniture arrangement is effective such that it allows the performance of different activities in the classroom.	4	3	2	1
21	Educational equipment is clearly labelled and is easily accessible in classrooms.	4	3	2	1

22	The sound level of equipment and teachers' voices in the classroom are conducive to learning processes.	4	3	2	1
23	Teachers have adequate personal workspace and storage.	4	3	2	1
24	Teachers can easily see and observe students in the classroom.	4	3	2	1
25	Furniture is suitable and well-maintained.	4	3	2	1
26	There is appropriate lockers space for students' belongings.	4	3	2	1
27	The classroom has space for students' work display.	4	3	2	1
28	Teachers have the authority to change the arrangement of classrooms.	4	3	2	1
29	Teachers encourage students to personalise and develop their learning environment.	4	3	2	1
30	Teachers are aware of changing classroom seating arrangements regularly.	4	3	2	1
31	The educational authority pays attention to the quality of the learning environment.	4	3	2	1
32	The classroom density is good, and there is no overcrowding which supports teachers to control their classrooms.	4	3	2	1
33	Teachers are satisfied with classroom temperature.	4	3	2	1
34	Students are allowed to make changes in the classroom arrangement.	4	3	2	1
35	The classroom arrangement depends on teaching strategy.	4	3	2	1
36	The classroom interior and exterior decoration are good.	4	3	2	1
37	Teachers are aware that each subject dictates different arrangement and changes, and that this affects the classroom.	4	3	2	1
38	Teachers believe their school fosters an appropriate environment for social, moral and educational development.	4	3	2	1
39	Teachers are aware of changing learning locations regularly in order to change students' moods.	4	3	2	1
40	School administrators encourage and support teachers to pay attention to their leaning environment.	4	3	2	1

❖ Please note your comments and suggestions in the space provided regarding any areas of the learning environment. Thank you for your time and assistance to develop the physical learning environment.

....
....
....
....
....
....
....
....

Thanks for your cooperation

Appendix G. School administrator questionnaire

Date / Time: ... School Building Attitude Inventory - Administrator

School Name: ...

Please indicate the status of your facility in each area by circling the most appropriate description for each of the following questions. You may provide additional information in the space provided after each question.

1	A- When was your school built?				
	A. 40-49 years ago	B. 30-39 years ago	C. 20-29 years ago	D. 10-19 years ago	E.Under 10 years ago
	B- When was your school last upgraded or refurbished?				
	A. 40-49 years ago	30-39 years ago	20-29 years ago	F. 10-19 years ago	G. Under 10 years ago
Comments:					

2.	What is the size of windows in each classroom??
	A. It's large enough and gives natural light for the school.
	B. It size is small and lets little light into the classroom
	C. It's too small and does not provide enough light.
Comments:	

3	What kind of flooring is in the majority of classrooms?
	D. Wood
	E. Tile or Terrazzo.
	F. Carpet
Comments:	

4	Do the majority of classrooms have individual heat control?
	A. Yes
	B. No
Comments:	

5	Are classrooms air-conditioned?
	A. Yes
	B. No
Comments:	

6	When was the last time the interior space was redecorated?
	A. Over 10 years ago
	B. Between 5 and 10 years ago
	C. Less than 5 years ago
Comments:	

7	When was the last time the external spaces of the building were redecorated?
	A. Over 7 years ago

	B. Between 4 and 7 years ago
	C. Within the last 4 Years (or) no exterior surface requires Periodic Painting.

Comments:
....
....

8	Are there visible indications of roof leaks?
	A. Ceiling is deteriorating due to water damage and/or water falls into some areas of the facility requiring buckets for water collection.
	B. Ceiling is currently developing a few new stains due to minor leaks.
	C. No visible signs.

Comments:
....
....

9	How often are the classroom floors cleaned or vacuumed?
	A. Monthly
	B. Weekly
	C. Daily or more frequently

Comments:
....
....

10	Is graffiti commonly found on the premises? Circle Yes or No for each listed area:		
	A. Bathrooms	Yes	No
	B. Lockers	Yes	No
	C. Hallways	Yes	No
	D. Classrooms	Yes	No
	E. Exterior school walls	Yes	No
	F. Exterior walkways	Yes	No
	G. Other:		

Comments:
....
....

11	How long does the graffiti remain before it is removed?
	A. Until summer maintenance or the next painting cycle
	B. More than a week, less than a month
	C. Less than a week.

Comments:
....
....

12	What is the condition of the lockers?
	A. Most are not functional and need repair.
	B. Most of the lockers are functional and in good repair.
	C. No lockers were provided

Comments:
....
....

13	What type of material is used for interior ceilings?
	A. Wood or open beams.
	B. Plaster or acoustical tiles in at least 75% of the instructional spaces.
	C. Acoustical tiles throughout the instructional space.

Comments:
....
....

14	What type of lighting is installed in classroom areas?

	A.	Incandescent lighting
	B.	Fluorescent lighting
Comments:		
....		
....		
....		
15	What is the condition of classroom furniture?	
	A.	Most rooms have furniture that is either facially scarred or functionally damaged.
	B.	The furniture is partly damaged but still satisfies to be used
	C.	All of the classrooms have furniture which is functionally sound and facially attractive.
Comments:		
....		
....		
16	What is the condition of the school grounds?	
	A.	There is no landscaping, and sidewalks are either not present or damaged (it is unattractive to the community).
	B.	There is landscaping and the sidewalks are present and in good condition (it is acceptable to the community).
	C.	The landscaping and other outside facilities are attractive and well-maintained (it is a centre of pride for the community).
Comments:		
....		
....		
17	What colour are the walls in the teaching areas?	
	A.	Dark
	B.	White
	C.	Pastel colours (light colours)
Comments:		
....		
....		
18	Is the school located near loud noise producing environment?	
	A.	Yes, action not taken to reduce the level of noise within the school.
	B.	Yes, but measures have been taken to reduce the level of noise within the facility.
	C.	No noise in school
Comments:		
....		
....		
19	What is the cosmetic and structural condition of your facility?	
	A.	Below standard
	B.	Standard
	C.	Above standard
Comments:		
....		
....		
20	Which type of seating arrangement is usually used in classrooms?	
	A.	Row seating arrangement.
	B.	Clusters seating arrangement.
	C.	Cooperative arrangement
Comments:		
....		
....		
21	What is the maximum student number in each classroom?	
	A.	Less than 15
	B.	Between 15 and 25

	C. Over 25

Comments:
....
....

22	Do students need permission to change the arrangement of their classroom environment?
	A. No.
	B. Yes, permission is required from their teachers and administrators.
	C. Yes, permission is required from teachers, administrators and the Ministry of Education.

Comments:
....
....

23	Do you encourage students to personalise and develop their learning environment?
	A. Yes, by activities and rewards.
	B. Yes, if students express their desire to do.
	C. No at all.

Comments:
....
....

24	Are there a clear policy for the function and efficient of the school building?
	A. Yes, all school users are.
	B. Somewhat, it's included in the school policy but not circulated to students and teachers.
	C. No.

Comments:
....
....

25	Do you provide facilities for teachers to relax and spend their break time?
	A. Yes
	B. No

Comments:
....
....

26	Is the Ministry of Education aware of the importance of the quality of the physical environment in schools, and does it make periodic physical checks that apply to all public schools?
	A. Yes
	B. No

Comments:
....
....

❖ Please note your further comments in the space provided, as it is important to collect your concerns and suggestions about the school learning environment. Thank you for your time and assistance in completing this assessment.

....
....
....
....

Thanks for your cooperation

Appendix H. Interview transcript

<u>**Transcript of an interview with the official**</u>

17 & 23rd of April 2014 – 9:30 to 11:30 am

Interviewee: Eng. Abdul-Mohsen Sadeq. The Director of Design and Establishments department

Location: Ministry of Education, Kuwait.

Educational Establishment and Planning Department, Room 216

The interviewer: The Researcher (Mohammad Ali)

Transcriber: Mohammad Ali (21/10/2014)

Note: (Mohammad Ali = Ali) - (Abdul-Mohsen = <u>Mohsen</u>)

The interview was conducted in Arabic and subsequently translated to English by the researcher with expressed permission from the interviewee prior to recoding. The interview was conducted on the basis of informed consent. Importantly, this meant that the interviewee had the right to reject answering any question and the right to withdraw from the interview at any time.

Ali: Hello, I'm very pleased to have this opportunity to meet you and thank you so much for your time. As we briefly discussed on the phone, I'm collecting very important data for my PhD research in Birmingham City University about the quality of physical learning environments in our public schools. Seeing that you have 25 years' experience in this matter, can you please tell us what considerations have been taken into account in designing public schools?

<u>Mohsen:</u> Previously, the old school design used to last at least 15 years, and this was due to several reasons:

- The school building was constructed in such a way that it met the requirements. For example, schools were not equipped with air-conditioning, and the light units were not so strong.
- All studies conducted in Europe and western countries were very appropriate to the currents needs in Kuwait. For example, the natural lighting was good and sufficient in the classroom. Classrooms were additionally well-ventilated, and students' sight perspectives were well-controlled in school, with no noise and echoes. Moreover, our buildings were based on some studies from Arab countries, but the quality of those was nowhere near that of western counterparts.

Later, new school designs started to be implemented and landscaped by local architects within the Kuwaiti government. This often involved the Ministry of Works, and Ministry of Housing. So no appropriate studies and considerations were taken at the time, which started the problems with current school environments.

For instance, ten years ago, many educators and school administrators changed school buildings without any investigation and consideration from experts. An example is covering whole corridors in school; this caused a lot of negative effects on students and education. Many dark spaces were created, no natural light could enter, no natural ventilation could occur, noise reached between 60-80 db, and external noise from traffic and outside of the school grew significantly.

Ali: Yes, I felt that when I observed the classroom; the noise levels were not appropriate in the classroom environment. Can you inform us what the main reasons are for that?

Mohsen: I remember when our group was visiting some new school buildings, one of the schools was ready to open to the public. The space felt uncomfortable and loud, as the noise came from road traffic and wind. Honestly, the shape and design of the building were the main reasons for this problem.

So, we worked to create a school design that met the requirements of quality assurance. Thus, the design offered wide corridors, many open spaces for students' interactions as well as private areas that let students and teachers relax in their break time. Two main elements were taken into account to ensure compliance with the requirements for the environment in Kuwait. First students, are the "masters" of the Ministry of Education who have the topmost priority. Secondly, we had to consider teachers and staff; we have to offer them private rooms for each department with appropriate facilities like a mini-kitchen and sofa that allows them to feel relaxed in their room. Previously the teachers' rooms were big and used for many scientific sections in school without appropriate facilities. We are working to apply a new vision and consideration in our new schools and especially the school users; each individual is an important element.

Ali: Are there any standards or guidelines for designing a school?

Mohsen: Yes, we have the old guidelines that organise the learning environment's design. Classroom sizes have to be between 70 and 75 m^2, but this has been reduced to 50 m^2, which increases classroom problems currently. The standard size capacity for each student is 3.5 m, but the students has only 2 m in the small classroom size. Now all new designs are considered to provide all the facilities that are required like computers and projectors. Therefore, we need around 80 m to be enough for these facilities.

Also, the corridors have to be at least 2.5 m wide in a small school, and standards worldwide require 3.2 m. However, many school corridors in Kuwait are built such that they are less than 1.8 m, which is too small for two adults. We've heard many school administrators complain about this issue.

Ali: Are these guideline currently abided by in existing schools or will this be applied to new buildings?

Mohsen: We are always requesting for many factors to be considered, but unfortunately they (Ministry of Education) keep rejecting for different reasons unrelated to the environmental quality. We succeeded in raise their awareness of many elements, but this still needs many efforts for improvement.

Ali: Right, I'll jump a little bit deeper into these areas. Let's discuss briefly the criteria that need to be considered in the learning environment like size and corridors. Are these criteria regularly subjected to assessment and investigation in order to enhance the quality of leaning environment in each school?

Mohsen: Yes, we have some studies on each design proposal and some suggestions have been given to the official designer group, but unfortunately, we don't have an appraisal study for schools that been built and opened to the public.

Ali: Who is responsible for that? I'm sure you understand how important this issue is in relation to the quality of the learning environment.

Mohsen: Of course, it's an essential element. Due to many reasons, there are no specialist groups able to do it, and we are not prepared to conduct this kind of research. We need many tools and staff that are able to focus in this kind of research and work, and that's honestly not available here in the ministry and within our department. And even if we asked the officials, they would most likely not take it seriously as they feel this is not important.

Ali: Did you have any official claims for this kind of research from the Ministry of Education?

Mohsen: Unfortunately we haven't. We are always looking for relevant studies conducted elsewhere, like the United States of America and Europe, and then try to apply them in Kuwaiti schools. For example, in Norway, one school was complaining about the drop figures of performance and achievements for their students. The designers and architects found that the level of natural light was low, so they expanded the window size, which allowed more natural light to come in. This modification increased the students' performance dramatically in the classroom and solved the problem by design.

Also, another school was struggling with students' interaction and performance. The design group applied a blue line in whole school book pages, which support the students' performance slightly. So colours are initial elements in design. I personally love the theory of colours, which many of the educators are not aware of. In Kuwait, most schools are painted in beige colour palette. As you might know, the worst colour that affects learning experience in schools is grey, followed by beige. Grey is a colour that classified as senseless, and it's a colour that makes student not engaged in their learning. However, clear colours like blue, green, red, purple, orange and yellow are explicit colours, but many classrooms are painted blue with a grey finishing, and this does not make sense. As such, the best colours that are recommended to be used in classrooms are blue and green; these colours activate memory. Red is not recommended as it irritates the students and induces some aggressive behaviour.

Each colour has different effects. For example, in our latest school that had been built, we used light blue in classrooms with light purple on side wall. Purple helps calm people's nerves. Primary students in particular have extra energy that needs to be controlled in the classroom, and so using purple and blue is suggested in this circumstance. In the courtyard, I used many energy colours like red and yellow in order to encourage them to move and interact physically. Energy colours were also used in the canteen, as they draw out students' power that is normally calmed during class hours. So each wing and part of the school must be dealt with individually; this includes: corridors, toilets, play areas, and gathering spaces.

Painting all the school in one colour like (beige) is not recommended; it becomes like living in Sahraa (desert).

In Kuwait, the colour that is used most often everywhere is beige, and this stems from many reasons. For starters, many people are unaware of the colour power theory, so beige is usually the best choice. It is quite popular here; if you travel throughout Kuwait, you will notice most of the houses, malls, companies and lands are coloured beige. Where are the other colours? So this colour is the first choice for non-designers and architects. By the way, most professionals who choose the colour are not architects, but rather civil and space engineers. Still, we always force them to choose specific colours. Many of them prefer using beige due to the dusty condition in Kuwait, and so the dust is not clearly visible on walls if painted beige, but that does not make sense.

Natural light is also important. If for any reason electricity is cut off in at any school, natural light must be ample within whole school wings. If any space is so dark, this means that not enough natural light is accessible and obviously needs consideration.

Also echo and noises in schools must be extracted, as they exert negative effects on students.

We all have five senses: hearing, smell, sight, touch and taste. These senses must be fulfilled in the school, not just wood, concrete, bricks and paint. Many materials have a special odour, like leather. Soft touch effects are also important for learning and the quality of the environment.

Ali: The physiological modes for human understanding addressed by cognitive psychology include visual, auditory and kinetic learning. Do you think these elements are considered in our environment?

Honestly these elements are considered equally. Some of them are in account but not in the right ways.

Ali: Why are other elements not considered? Take kinetic learning, for example. In biology, the class the teacher could bring real animal bones to let students discover their texture. What is your concerns regarding this matter?

Mohsen: The visual elements exist but are not in good condition. Honestly, during our regular visits to schools in Kuwait, we always ask the school staff, students, teachers and administrators about their needs and requirements in their environment. We investigate these needs in order to provide the most appropriate facility for them. Moreover, we have regular meetings with the curriculum development team and raise our points to them.

For example, many of the schools have air conditioning units that are unsuitable for schools and users. They direct the cold air to one direction, and this has frequently increased cases of student illness. On the other hand, should the unit be shut down, the whole classroom will be hot. So the cold air must be spread evenly across the classroom without strong pressure in order to keep the classroom at a suitable temperature without affecting students.

Ali: In the context of cultural and gender differences, do these issues affect the school design features?

Mohsen: Yes, there are small differences. In girls' schools in our culture, ladies prefer to have more privacy than do boys, so we are considering providing higher school brick fences in order to give more privacy. In boys' schools, in contrast, more open fences are required, which encourages us to find different ways to let the male school boundaries connect with the outside world. That's why we built some schools with railing fences made from iron; this allows a greater view to the outside of the school, and gives a sense of openness rather than feeling imprisoned. Also, we tried to provide hedges (planted fences) a few years ago. These incur many benefits for Kuwaiti weather, but require professional maintenance and care, which are honestly difficult to ensure.

Many schools have been built from weak design elements that have encouraged the government to change their function to something else entirely. If you have heard of the Talha prisons in Al-Jaleeb town in Kuwait, you may know that it was a primary school built around 1960. Later on, it was transformed into a central prison because its design met the requirements for a prison. They covered the ceiling and closed the corridors completely to be used as prison and that become one of the best prisons in Kuwait which clearly show the corrupt design in the public schools. So I noticed many schools are currently closing and covering the corridors and ceiling in order to deal with the hot weather. It makes me wonder where the architects are who authorised such protocols in our schools. Because of this, I think these actions should be not be taken until after consulting our department, as they can potentially impair the quality of the learning environment.

Ali: So if the problems are internal to the schools, they have to consult your department? Isn't that correct?

Mohsen: Honestly, they already had consulted the deputy manager who has the authority. However, the deputy manager is not keeping us in touch with many of the ongoing construction and architectural issues, and this clearly causes a lot of trouble in schools. In the deputy management office, they've got consultants and architects, but they are not qualified and not aware of the importance of environment for learning. They always permit many changes in schools without a solid foundational study that considers factors such as vision and quality. They give the final word and permission for refurbishment proposals and school development, but we don't.

Ali: Ok. Let's jump to the students' ages in primary, intermediate and high school. What are the considerations that are taken for each of these school age categories?

Mohsen: Yes, in primary schools, the door handles, corridors, seating space and windows have to be lower in height than in intermediate and high schools. As I have seen in many contracts, detailed proposals for new schools featured window heights of 90 cm. This is acceptable in many buildings, but isn't suitable in primary schools. So I had this changed to 70 cm in order for students to feel more comfortable in their building. I have also suggested installing glass instead of wall in classroom, which gives positive influence on classroom users and enough natural light. Also, handrails must be installed at the right height, and so should whiteboards. The same applies to toilet facilities.

Ali: Let's discuss the geographical location of the schools in terms of the density, size, cultural issues and academic level of community. Do these affect the schools' design?

Mohsen: When we work on school design, the deputy manager asks us to provide more facilities to central schools compared with other schools in some districts. But I always disagree because each student has the right to the same extent of facilities. Therefore, all schools have to be at the same standard. As you know, a well-designed environment is crucial to tailor students' behaviour. In general, I think we all tend to take care of our environment if it's tidy and neat like our homes.

Ali: What about the density? As you know, many areas have a bigger population density, and this needs more schools and facilities to accommodate them. So what measures have you taken in place for this?

Mohsen: Yes, we are considering the current figures for each area, and then investigating the school capacity in these areas. By the way, each school can accommodate 750 students as a standard. This is always a crucial complaint that we receive from big schools, in that they (the school administrators) are unable to control students and the learning process. The ministry's standards dictate that each school should have a maximum of 24 classrooms at primary and intermediate levels, and 30 classrooms at secondary level. Moreover, each classroom should accommodate a maximum of 25 students only. Most schools now accommodate less than 750 students, due to some schools not having enough spaces and classrooms big enough for 24 students at most.

Ali: 750 students per school is not a huge number. In terms of traffic, school entrance, and exit, would it be better to divide the school into two schools with different managements?

Mohsen: Yes, we have a problem. Some areas do not have enough space to be used as schools due to a huge population that inhabits one region. These figures are jointly reported by Kuwait Municipality (Council) and the Ministry of Education, both of whom are the responsible for dividing spaces into schools, houses, clubs, masjids and facilities for the community. So Kuwait Municipality allocates specific spaces for schools depending on the house numbers in the area.

But it's still difficult to divide the school location into two schools. If it was big enough, it would need more investigation and studies in order to demonstrate its benefits for the area and community.

Ali: I notice many that in many schools site, less than half of the total site is used for learning and activities, whilst the other half is just a sandy area unprepared for any activity. So why are such areas not used for new schools?

Mohsen: That could be true; if we need a new school in any area, we have to allocate a space for it, but this is not our job. In Al-Dieyah area, for example, we have divided one very big school into two schools, one primary and the second intermediate. This has also been done in other areas.

Ali: The new schools that have been built recently adopt wing shapes and consist of hexagonal classrooms. I've heard they're too small compared with older school designs. What are your comments on this aspect?

Mohsen: Yes, they are smaller in size, but you have not considered other environmental qualities like echo, natural light, attracting colour and design. The school design should be based on many elements, the corridors have to be short, and the level of natural light should

be evenly distributed across all classrooms during the school time. These prototypes were developed by the architect (Jamal Al-Haji) who obtained his degree from the US. His inspiration came from the theatre in which all seats are directed to the main stage. Effectively, he transformed his inspiration to the teaching area of the classroom, where students are the audience. In a way, the classroom in this design was good in shape but small in size.

This design was created in 1998, wherein the architects built a 1:1 scale prototype for the classroom. It was computable with the requirement in that time, but many policies were left out then and only later agreed on. These include, for instance, the requirement for computers and projectors, which need more space. It's obvious that this design has many characteristics in term of functionality. For instance, the school's administrator's office is in the right position, as s/he can see the whole school segments. Also, all school administrator offices are located in first floor; this gives a sense of privacy for people to do their jobs without distraction. However, other architectural problems arise, like:

1. The corridor is exceedingly smaller than the recommended standards.
2. The shape of the school building is changed completely, which may be nice in each wing but is not equivalent.
3. The natural light was not coming from the left side of the students, but was rather emanating from behind their backs. This created glare and was not equal in all classrooms. As all classrooms were adjacent to each other, no windows could be installed on the sides of classrooms, so this needs urgent modification to allow natural light permeation.
4. This design was implemented in many new schools at the same time. They should have done so one step at a time to allow addressing any problems rather than have it applied to all schools.

On the other hand, I think the idea of privacy for school managers and administrator is not suitable. The old design shapes considered locating the manager's office in school yards or within sight of students in order to let students feel safe at school. However, the idea of separation does not support this view, as students might feel unknown at school. I believe the school management must be part of the school segments and not separated. The school management are responsible for controlling the school and students, so it's insensible to let them out of the students' sight.

Ali: Regarding the history and culture of Kuwait, these issues have to be reflected on its building and schools. In that sense, what are the measures that you have taken to ensure these elements reflect positively on Kuwait?

Mohsen: In fact, we are always considering the heritage and culture of Kuwait, including old fashion design elements, which we then improve to be compatible with current requirements and needs. I don't like to provide the same texture and decoration elements as used previously, but rather modify them into design elements that remind the students of their culture while simultaneously fulfilling a function suited to this century. In Kuwaiti culture, our ancestors lived in mud houses; the living area was either the house yard located in the middle of the house, or on the roof. When bricks and concrete became available, people started building their living rooms and balconies in order to have fresh air and light. So the culture of traditional Kuwaiti architecture emphasised the importance of open yards, living on the roof, and providing a balcony to allow circulation of natural light and fresh. Unfortunately, schools nowadays are closed up and covered completely, which impedes permeation of natural light and fresh air. So I think this is wrong, we have to provide

balconies in the schools in order to provide enough natural light without creating any glare in the boards. Most classrooms have blinds that do not function well, as they prevent natural light from spreading into the classroom and students from seeing outside the classroom. So it is a critical job for us to provide all the physical elements for the students without affecting them.

Ali: What are your concerns and guidelines for classroom design in terms of size and requirements?

Mohsen:

- The entrance of the classroom must be from the classroom side (right or left of the boards)
- Natural light must come in from the left side of students. This is because when students write, the shadow must be outside their view, so it's distracting if students' shadows reflect onto their notebooks.
- The current classroom must be around 70-80 m^2 in area.
- The classroom shape should either be rectangular with the board located in the middle of the smaller wall, or square with the board located in the middle of one wall. This ensures that the edge between students sitting at the back is reduced so as to not block their view.

Ali: One of the latest policies approved by the Ministry of Education aimed to decrease the maximum student number in each school to 25. What is your view in this regard?

Mohsen: Honestly, these points must be directed to the minister's office as he authorises such policies but in my view, I agree because reduced student density supports extra educational aids for the enhancement of their learning and progress. As we currently provide classroom layouts to accommodate slightly larger spaces, we are considering preparing extra space for projectors and computers. This way, each school will be equipped with a projector in each classroom, but we are not responsible for providing projectors unless specifically requested by the minister's office.

Ali: So if I understood you correctly, all the requirements and needs should specifically be requested by the minister's office and then translated into the design?

Mohsen: Yes, we receive all the needs from scientific departments and the minister's office, which includes curriculum, facilities, music, PE, school management… *etc*. Then we create the school design based on these elements. If we feel one of the elements is not right, we have to contact the particular party to reach an agreement between us.

Ali: Who has the final word?

Mohsen: The minister does. We just fulfil their needs in the spaces without consideration, but if they need a particular arrangement upon which we disagree, they could still do it, unfortunately.

Ali: Do you think the final word is the right of educators, or architects?

Mohsen: We always struggle with them in these issues .I remember ten years ago, I had a project to design a new school, the total size of which was 12,500 m^2. At the time, this figure was under the standards for intermediate schools. The standard sizes for school buildings are authorized after consulting the Ministry of Construction (main office in our department) and European architecture companies who undertake extensive investigation and research to specify the appropriate size for schools. These are: 14,000 m^2 for kindergarten, 17,000 m^2 for intermediate schools, and 21,000 m^2 for high schools. So the land area was less than standard by 40% approximately. This project was challenging to me, and the minister's office was unhappy to build the schools in this area, but the proposed design which I created was:

- The site included a staff car park for the school's administrators.
- Indoor sport hall enough for 630 seats (these give more privacy for girls)
- Indoor amphitheatre with 430 audience seats and all facilities.
- Swimming pool for 340 persons
- Huge library.
- Cafeteria, which no school has at that time.
- I've done ensured all facilities meet the requirements for a positive learning environment.
- There used to be a mosque hanged midway above the courtyard, partly in response to the ministry's request to cover all courtyards in an attempt to reduce the excessive heat from the sun. So we proposed to cover a quarter of the space via linking the mosque to the main building by a bridge. This represents the importance of such a space in our religion, and its architectural setting is no less significant.

We succeeded in creating an effective school design that facilitates all requirement for girls' schools within these areas. But unfortunately, the minister's office did not accept it due to its huge budget cost. Also, they suspected that the proposal may have had many problems without addressing their concerns to me. Not only that, they then changed the design specifications and elements to a way that did not suit our original plan, and actually applied it to some school site a few years ago. However, they have stopped now. The way in which ministry officials deal with many matters including school design is a major defect that affects the quality of the learning environment.

Ali: Regarding collection of data from school users, how do you obtain this information?

Mohsen: I think the Department of Research might be doing some research in this regard, but I have not received any kind of these data before. However, personally, I make sure to get the students' concerns for their environment through my children and family, by asking them about their needs and feedback about changes that happened recently. I asked my son about covering the school corridor and courtyards; he noticed that this change made him feel sleepy due to less natural light and fresh air. Students also noticed the noise coming from adjacent classrooms because the corridor is covered, and so students could hear what the next door teacher was saying. Moreover, as the classroom was located at the end of the corridor and the supervisor's room was located at its beginning, they could hear the telephone ring from there. Honestly, some school administrators covered the corridors in order to reduce the amount of dust, but that did not improve the situation as dust still seeped in as before.

Ali: The school administrators are always creating many modifications and improvements to the original school environment and the same with the newly built schools, like changing the location of the classroom, teacher's room and labs. Why?

Mohsen: I believe this problem is being addressed in our schools. Honestly, we are part of this problem (our department and mainly the ministry officials) as I mentioned earlier. Before starting to build any school, we have to research and investigate to specify the needs. So firstly, these investigations seem to be wrong or specify the needs for wrong figures. Also, we are under lots of pressure to complete school construction as soon as possible without considering the right procedures and roles. For example, when school administrators enter the new school painted totally beige, they would usually change the colour without consulting us; they are not aware of the effects colours have on students. So the school will not be under our standards. If we can get enough time and authority to work in each school, we could finish all schools at the highest standards that consider a variety of positive colours, sizes, materials... *etc*.

Concerning Om Amarah School, we had enough time to work on it, as we used a variety of colours and shapes of good quality. In corridors and the cafeteria, we used cool colours, whereas in classrooms, we considered positive colours like orange to enrich the students' memory. Strong colours were used in outdoor areas to encourage them to do physical activities, and in classrooms to help them stay calm and focus on the learning.

Ali: According to the recent case studies that I've collected from students, teachers and school administrators. They were not satisfied with their physical learning environment. Can you address your concern regarding these problems?

Ali: The colour used in schools:

Mohsen: Yes, as I mentioned, this problem arises because non-experienced people choose the paint colour in school without our consultation. If you look at the schools we designed, you would notice the difference in the colour that has a positive effect on users.

Ali: Lockers- most schools do not have storage or storage is in a bad condition:

Mohsen: There are two main points to address regarding this problem. First, the provided storage unit was not in good quality, and was unreliable because it was made from aluminium. Second, the school and ministry fail to maintain the units regularly and circulate each unit for a particular student. Moreover, individual students should assume responsibility for their personal units.

Ali: Seating arrangement in the classroom:

Mohsen: In the general educational department, there are specialist educators aware of the type of these arrangements in the classroom; they investigate the best setting for learning. In primary schools, we provide furniture in a circular arrangement and divide it into five circles directed to the teacher's space. So five groups of five students arranged in a circular shape forces us to increase classroom size to 80 m^2. This is because circular shapes occupy a greater amount of space, and this affects teacher mobility during class.

Ali: But these arrangements are permanent, which does not work every time (*e.g.* exams). So are these arrangements suggested?

Mohsen: Yes, that's right, but this arrangement was not authorised by us, but from the general education department. The company that manufactures the school's furniture has all the authority, and we are not permitted to take any part in the design of materials. In all honesty, they (the general education department) call for our opinion regarding the school's furniture as architects, and we send them the best selection depending on the design and quality. Unfortunately, at the end, they disregard our opinion.

Ali: How can you motivate students to learn and take care of their environment?

Mohsen: By providing an efficient environment that has a positive colour and natural lighting, with modern design that allows students to interact and stay motivated in the school. The ministry officials usually change the standards in the school environment in order to save time and reduce the cost. In the last seven years, the ministry authorised the decision to reduce the maximum student number in classrooms to 25. As such, we were under continuous pressure from the ministry to increase classroom numbers in each school to fulfil the needs.

Regarding school curricula, each two years the Ministry of Education authorises new curricula and new subjects. Accordingly, these changes require different arrangements for the school building, which affects the quality due to these changes needing a long time for implementation. Unfortunately, they force us to finish it in a short time. For example, the previous classroom design strategy was facelifted without computer facilities and projectors, but now each classroom needs to be equipped with these facilities. Also, a new art subject was launched in the school's curriculum, which needs more art pieces and sculpture rooms in the schools. There was only one music room in each school, but now they require several rooms for training and production. Science labs were just 70 m^2, but now they are required to be 140 m^2. As such, we have to design the labs so that half of the space is devoted to the lecture, which consist of seats and a projector, and half for lab experiments which have tabs and all facilities.

Ali: Finally, can you please briefly clarify who is authorised to design and create the school building, and what the procedure required for this is?

Mohsen: Honestly, the school design in the last ten years has been authorised by the Ministry of Works and Ministry of Housing. These two ministries are not fully aware of the learning environment. The procedures are not strictly followed due to many obstacles facing it, but briefly the procedure are:

1. Specify the requirements and needs by the ministry's deputy office.
2. Specify who will present the design proposal, either the Ministry of Works or Housing or us (the Department of Design and Establishment within the Ministry of Education):
   - If they decide to let the Ministry of Works or Housing create the design, they usually collect the data from our department.
   - If the Department of Design was asked to create the design, then the discussion and draft consulting would be between our department and the Ministry deputy office.
   - Present the design draft for us for consulting, and then we sort out the suggestion and modification.
3. Confirm the final design proposal by the Department of Design and then the Ministry deputy office through considering all data that been collected.

4. Send the final design proposal to the construction team; it is the same group who has the design scheme.
5. The responsible group is required to finish school construction within the agreed time scale, and then submit to the Ministry of Education.

As a department concerned with design, we don't have the authority to interfere in any part of the construction process. They usually change some details after agreeing on the final contract. The main problem is that these procedures are not adhered to strictly; many changes occur without our knowledge. This is because the ministry's deputy office has the authority to change any elements in the design. And of course, they do not consider all environmental and architectural aspects which may affect the quality of the school's physical environment.

Appendix I. Space and facility requirements for intermediate school building

Space and facility requirements for intermediate public schools

Department of Design and Establishment, Ministry of Education, Kuwait

First: School administration area

	Requirements	Amount	Unit space (m²)	Total space (m²)
1	Entrance and waiting hall	1	25	**25**
2	School administrators office	1	40	**40**
3	School deputy office	2	20	**40**
4	Secretarial office	2	12	**24**
5	Administrative staff room	1	16	**16**
6	Student affairs room	1	64	**64**
7	Printing room	1	32	**32**
8	Control room	1	60	**60**
9	Social services office	1	20	**20**
10	Psychological service office	2	16	**32**
11	Follow-up and reception room	1	15	**15**
12	Stationery store	1	35	**35**
13	Medical clinic (office, waiting, pharmacy, toilets)	1	35	**35**
14	School broadcasting room and store	1	30	**30**

15	Meeting room	1	50	**50**
16	Administration catering room	1	12	**12**
17	Furniture and teaching aids store	1	145	**145**
18	Administration toilets	1	15	**15**
Total area				**690**

Second: The study suites

	Requirements	Amount	Unit space (m^2)	Total space (m^2)
1	Classrooms	24	80	**1920**
2	Scientific clubs (in the classrooms sections)	4	60	**240**
3	Administrative supervision room	4	12	**48**
4	Chemistry lab	1	140	**140**
5	Physics laboratory	1	140	**140**
6	Biology lab	1	140	**140**
7	Geology lab	1	140	**140**
8	Laboratory preparation rooms	3	25	**75**
9	Science teachers room	1	40	**40**
10	Science teachers astatines room	1	15	**15**

			Amount	Unit space (m²)	Total space (m²)
11	IT lab and storage		4	75	**300**
12	Language lab		1	75	**75**
13	IT teachers room		1	25	**25**
14	Control room		1	20	**20**
15	Cinema and seminars room		1	100	**100**
16	Educational facilities tutor room		1	15	**15**
17	Educational facilities workshop with storage		1	75	**75**
18	Music room and storage		1	100	**100**
19	Arts room		3	75	**225**
20	Arts storage		3	25	**75**
21	Library / librarian		1	200	**200**
22	Library storage		1	20	**20**
Total area					**4128**

	Requirements	**Amount**	**Unit space (m²)**	**Total space (m²)**
1	Civil defence association room	1	20	**20**
2	Teachers room	5	50	**250**
3	Teaching facilities (aids) storage	5	10	**50**
4	Technical supervision rooms	2	9	**18**
5	Teachers' toilets	5	12	**60**
6	Students' toilets	4	35	**140**
Total area				**538**

Workshops

	Requirements	Amount	Unit space (m²)	Total space (m²)
1	Décor and practical studies workshop	2	75	**150**
2	Electricity workshop	2	75	**150**
3	Workshops storages	2	25	**50**
4	Practical studies teachers rooms	1	50	**50**
5	Catering room	1	8	**8**
6	Teachers' toilets	1	8	**8**
Total area				**416**

Consumer sciences lab (girls' schools only)

	Requirements	Amount	Unit space (m²)	Total space (m²)
1	Food and nutrition Labs	2	75	**150**
2	Food and nutrition storage	1	25	**25**
3	Fashion design lab	2	75	**150**
4	Fashion design storage	1	25	**25**
5	Teachers' room	1	30	**30**
6	Catering room	1	8	**8**
7	Teachers' toilets	1	8	**8**
Total area				**396**

Third: Physical education hall

	Requirements	Amount	Unit space (m²)	Total space (m²)
1	The sport hall	1	1125	**1125**
2	Sport equipment's storage	1	30	**30**
3	Changing room	1	75	**75**
4	Students' toilets and showers	1	50	**50**
5	Teachers' room	1	50	**50**
6	Teachers' toilets	1	18	**18**
7	Table tennis hall	1	112	**112**
8	Stadium accommodating 150 people	1		
9	Scouts club and tools	1	50	**50**
Total area				**1510**

Fourth: The Theatre

	Requirements	Amount	Unit space (m²)	Total space (m²)
1	The main theatre (accommodating 400 persons)	1	850	**850**
2	Theatre stage	1	100	**100**
3	Theatre storage	1	25	**25**
4	Changing room	1	25	**25**
5	Cafeteria room	1	60	**60**
6	Covered ceiling area linked to the cafeteria	1	75	**75**
7	Toilets	1	12	**12**
Total area				**1147**

Fifth: Facilities and services area

	Requirements	Amount	Unit space (m²)	Total space (m²)
1	Mosque and storage	1	200	**200**
2	Bus drivers' room	3	12	**36**
3	The school guard's room, kitchen, toilet	1	30	**30**
4	Agriculture tools room	1	15	**15**
5	Electricity room	1	15	**15**
6	Gas cylinder storage	1	15	**15**
7	Students waiting rooms	1	100	**100**
Total area				**396**

Sixth: outdoor playground

	Requirements	Amount	Unit space (m²)	Total space (m²)
1	Boys' football stadium	1	9600	**9600**
2	Running track around the football field / boys	1	6-8 lanes	
3	Handball court	1	968	**968**
4	Basketball court	1	448	**448**
5	Volleyball court	2	162	**324**
6	Tennis court	1	120	**120**

Appendix J. Letter from Birmingham City University and approval permissions from the Ministry of Education in Kuwait

BIRMINGHAM CITY
University

02, Dec. 2013

TO WHOM IT MAY CONCERN

Dear Sirs

Re: Mr Mohammad Ali

This letter is to confirm that the above named person is a PhD research student at the BCU School of Architecture. The title of his research is:

The influence of physical environment on learning behaviour: the case study of secondary schools in Kuwait

As part of his research, Mohammad is going to carryout a case study survey in Kuwait during Dec 2013 and January2014.

If would be pleased to provide further information regarding his research and his survey task if required.

With kind regards

Yours sincerely,

Professor Mohsen Aboutorabi,
Director of Research Studies,
Birmingham School of Architecture,
BCU

Birmingham Institute of Art and Design
Birmingham City University
Birmingham School of Architecture
The Parkside Building 5 Cardigan Street Birmingham B4 7BD
T: 0121 331 5130/5110 F: 0121 331 7939
www.bcu.ac.uk

الرقم: ٦٦٥

التاريخ: ٢٠١٣/١١/١٦

مدير عام منطقة حولي التعليمية

تحية طيبة وبعد ،،،

الموضوع: تسهيل مهمة

يقوم / محمد عبدالله ملا علي المسجل معيد ببعثة بالهيئة العامة للتعليم التطبيقي والتدريب بعمل دراسات على البيئة التعليمية في الكويت وجمع معلومات تتعلق بجودة البيئة التعليمية من الجانب المعماري.

فيرجى تسهيل مهمة المذكور أعلاه من خلال عمل الدراسات التالية:

- جمع معلومات عن المبنى المدرسي وجودته، مع جمع صور ورسومات للمبنى والفصول المدرسية.
- أداء استبانة للطلبة والمعلمين المختومة صفحاتها من إدارة البحوث التربوية.
- عمل ملاحظة لتفاعل الطلبة والمعلم مع الفصل المدرسي ومع جمع بعض الصور لذلك.

على مدارس المرحلة المتوسطة التابعة لمنطقتكم التعليمية خلال العام الدراسي الحالي ٢٠١٣/٢٠١٤.

مع خالص الشكر والتقدير

مدير إدارة البحوث التربوية

أ. ابتسام المطوع
مدير إدارة البحوث التربوية

- نسخة للملف
- Noura

الصادر

Ref. :

Date :

٢ ٩ DEC 2013

الرقم : ٥٩٤٤٢

المرجع:

التاريخ:

السادة المحترمون / مديرو مدارس المرحلة المتوسطة (بنين) .

تحية طيبة وبعد ،،،،

يرجى التكرم بتسهيل مهمة المعيد / **محمد عبدالله ملا علي** المسجل بالهيئة العامة للتعليم التطبيقي والتدريب باجراء بحث ميداني في مدارسكم من خلال عمل دراسات على البيئة التعليمية في الكويت وجمع معلومات تتعلق بجودة البيئة التعليمية من الجانب المعماري ، وذلك من خلال عمل الآتي :

- جمع معلومات عن المبنى المدرسي وجودته ، مع جمع صور ورسومات للمبنى والفصول المدرسية .
- تطبيق (استبانة) على الطلبة والمعلمين لديكم المختومة صفحاتها من إدارة البحوث والتطوير التربوي .
- عمل ملاحظة لتفاعل الطلبة والمعلم مع الفصل المدرسي ومع جمع بعض الصور لذلك .

وذلك خلال العام الدراسي ٢٠١٣/٢٠١٤م .

ولكم خالص التحية ،،،،،

مدير عام

الإدارة العامة لمنطقة العاصمة التعليمية

نسخة لكل من :

• مدير عام المنطقة
• قسم التخطيط والمعلومات

Ref. : المرجع:

036809

Date : 2 9 DEC 2013 التاريخ:

نشرة خاصة

لمدارس المرحلة المتوسطة (بنين – بنات)

السيدات و السادة المحترمون / مديرات ومديرو المدارس .

السلام عليكم ورحمته وبركاته ، ،،،

<u>الموضوع/ تسهيل مهمة</u>

إشارة إلى الموضوع أعلاه، وإلى كتاب إدارة البحوث والتطوير التربوي رقم ٥٩٣ بتاريخ
٢٠١٣/١٢/٢٦

نحيطكم علماً أن السيد / محمد عبد الله ملا علي – المسجل بعثة بالهيئة العامة للتعليم
التطبيقي والتدريب يقوم بإجراء دراسات على البيئة التعليمية في الكويت وجمع معلومات تتعلق
بجودة البيئة التعليمية من الجانب المعماري.

فيرجى تسهيل مهمة الطالب المذكور أعلاه من خلال الدراسات التالية:

- جمع معلومات عن المبنى المدرسي وجودته، مع جمع صور ورسومات للمبنى والفصول
المدرسية.

- تطبيق استبانة للطلبة والمعلمين المختومة صفحاتها من الإدارة المذكورة .

- عمل ملاحظة لتفاعل الطلبة والمعلم مع الفصل المدرسي مع جمع بعض الصور لذلك.

و ذلك في مدرستكم خلال الفصل الدراسي الحالي ٢٠١٣/٢٠١٤

للتفضل بالاطلاع والعلم.

مـــع خالـــص التحيـــة والتقديـــر، ،،،،

مديـــر عـــام

الإدارة العامة لمنطقة الجهراء التعليمية

طلق صقر الهيم
مديـر عـام
الإدارة العامة لمنطقة الجهراء التعليمية بالإنابة

وزارة التربية

نسخة لكل من:
- مكتب المدير العام.
- إدارة الشؤون التعليمية
- الإدارة العامة لمنطقة الجهراء التعليمية
- مراقبات التعليم (المتوسط)
- الملف: ٢٠١٣/١٢/٢٦ A / M

P.O.Box: 7 Safat - Code 13001 Kuwait   ص.ب: ٧ الصفاة – الرمز البريدي ١٣٠٠١ الكويت
www.moe.edu.kw

Appendix K. Ethics consideration for this research

All of my research materials were in accordance with the BCU Ethical Guidelines as well as those of the Kuwaiti Ministry of Education. Rights, safety and well-being were significantly considered for all research participants. The methodology did not had any associated risks, and the participants were informed of the procedures which they are going to take part of. The case studies investigation was undertaken during school time, from 7:30 am to 1:30 pm, where part of the physical survey was conducted after school time.

Moreover, the permission granting procedures in Kuwait require written letters of consent from the Director of Study describing the project and its objectives. Of note, the Kuwaiti Educational Authority was not required a CRB check. The researcher discussed with the participants the aims of his project and the particular information that was to be collected. The researcher believed that collecting consent from each student was not something which is normally required as the school has permission to do that, so gaining permission to access the schools in Kuwait was ensures the ability and right to involve students, teachers and school administrators as participants. This permission were not force any individual participant to become involved in this project - this can only happen after their personal acceptance.

However, all participants were aware of their rights during the research. For instance, they were able to withdraw at any stage during the project should they so wish. The data were handled in a secure and confidential manner, and were not to be shared or displayed to any individual or organization without express permission from the participants. The collected data was and will be kept secured and strictly managed by the researchers, and no one may be allowed to access to the data without consent from the participants.

Appendix L. Arabic formats Appendices

1. The Pilot study questionnaire

إسم المدرسة : .... الفصل : ....

الـتــاريــخ : ....

ملخص الدراسة:

هذه الدراسة تهدف الى التعرف على الجوانب المؤثرة في تصميم البيئة التعليمية في المدارس الحكومية في دولة الكويت، بالإضافة إلى تقييم مستوى أداء وتفاعل الطلبة للبيئة التعليمية في المدراس الحكومية؛ من حيث جودة التصميم وتوافر المتطلبات الأساسية للحصول على بيئة تعليمية جذابة وهادفة تحرص على تلبية متطلبات المتعلمين والمعلمين والعملية التعليمية. و يتلخص الهدف الأساسي لهذه الدراسة في إيجاد السبل والوسائل التي ترتقي بالتصميم المعماري والداخلي للمدراس الحكومية في دولة الكويت؛ مما يؤدي الى تطوير جودة التعليم ودفع عجلة التنمية والتطوير في الخدمات التعليمية في دولة الكويت.

الإرشادات:

الرجاء وضع خط أو دائرة على الخيار الأنسب لك وفقا لرؤيتك وشعورك لتصميم البيئة التعليمية في مدرستك:

1. ما هو تقييمك لجودة تصميم البيئة التعليمية في مدرستك وفصلك المدرسي؟
( )غير ملائم   ( )مرضي   ( )جيد   ( )جيد جدا

2. هل تعتقد أن البيئة التعليمية وفصلك المدرسي يحتاج إلى تطوير بشكل ملحوظ للأفضل؟
نعم ( )   لا ( )

3. هل تصميم البيئة التعليمة الحالي لمدرستك وفصلك الدراسي يشجعك على التركيز اثناء التدريس؟
نعم ( )   لا ( )

4. هل الأثاث المدرسي في فصلك الدراسي ثابت على هيئة واحدة ولا يتغيير؟
نعم ( )   لا ( )

5. هل الاثاث المدرسي في فصلك الدراسي قابل للحركة والتشكيل وفقا لمتطلبات الحصة الدراسية؟
نعم ( )   لا ( )

6. هل أنت راضٍ عن حجم فصلك الدراسي من حيث المساحة وعدد الطلبة في الفصل؟
نعم ( )   لا ( )

7. هل تعتقد أن الإضاءة المتوفرة في الفصل المدرسي مناسبة وكافية لمتطلبات الحصة الدراسية والعملية التعليمية؟
نعم ( )   لا ( )

8. هل تنسيق الألوان المستخدمة في الفصل المدرسي والبيئة المدرسية مناسبة ومشجعة للعملية التعليمية؟
نعم ( )   لا ( )

9. هل تشعر بأن درجة الحرارة الفعلية في فصلك المدرسي مناسبة طوال العام الدراسي؟
نعم ( )   لا ( )

10. هل تفضل أن تتم دراسة المواد الدراسية في فصول مختلفة ولا تكون مشتركة في فصلٍ واحد؟
نعم ( )   لا ( )

أرجو تزويدنا بأية ملاحظات او توصيات تهدف لتطوير تصميم البيئة التعليمية :

....
....
....
....

وشاكرين لكم حسن تعاونكم

2. Students questionnaire

<table>
<tr><td colspan="2" style="text-align:right">طلبة
School Building Attitude Inventory -Students ....</td><td style="text-align:right">التاريخ ....
إسم المدرسة: .... الصف: ....</td></tr>
</table>

ملخص الدراسة:

هذه الدراسة تهدف الى التعرف على الجوانب المؤثرة لتجهيز وترتيب المساحات المدرسية الشاملة للصفوف والمختبرات والممرات وغيرها في المدارس الحكومية في دولة الكويت، البيئة التعليمية تعني الظروف والتجهيزات التي تشمل حجم ولون وشكل الصف المدرسي والمساحات الاخرى ؛ بالإضافة إلى جودة التصميم وتوافر المتطلبات الأساسية للحصول على بيئة تعليمية جذابة وهادفة تحرص على تلبية متطلبات المتعلمين والمعلمين والعملية التعليمية. و يتلخص الهدف الأساسي لهذه الدراسة في إيجاد السبل والوسائل التي ترتقي بالتصميم المعماري والداخلي للمدارس الحكومية في دولة الكويت؛ مما يؤدي الى تطوير جودة التعليم ودفع عجلة التنمية والتطوير في الخدمات التعليمية في دولة الكويت.

الإرشادات:

➢ عزيزي الطالب يرجى وضع خط أو دائرة على الخيار الذي تراه الأنسب وفقًا لرأيك وشعورك في مدرستك وفصلك المدرسي:

لا	نعم		
لا	نعم	أنا أحب مدرستي.	1
لا	نعم	أنا أحب الذهاب لمدرستي كل يوم.	2
لا	نعم	حجم فصلي المدرسي جيد.	3
لا	نعم	أحب لون فصلي المدرسي.	4
لا	نعم	هناك اضاءة طبيعية (الشمسية) كافية في فصلي المدرسي.	5
لا	نعم	درجة الحرارة في الفصل المدرسي جيدة .	6
لا	نعم	هناك خزائن كافية لأغراضي الخاصة في المدرسة.	7
لا	نعم	فصلي المدرسي مريح ومشوق.	8
لا	نعم	تنسيق الطاولات والكراسي في فصلي المدرسي جيد ويشجعني على التركيز مع المعلم.	9
لا	نعم	مستوى الإضاءة جيد في فصلي المدرسي.	10
لا	نعم	لا أسمع أي أصوات مزعجة في فصلي المدرسي.	11
لا	نعم	فصلي المدرسي نظيف ومرتب.	12
لا	نعم	الكراسي مريحة في فصلي المدرسي.	13
لا	نعم	هناك هواء نقي طبيعي في فصلي المدرسي.	14
لا	نعم	فصلي المدرسي في وضع جيد ومناسب للدراسة.	15
لا	نعم	الكمبيوتر والبروجيكتر(جهاز العرض) متوفر في فصلي المدرسي.	16
لا	نعم	من الممكن الوصول لدورات المياه بسهولة في المدرسة.	17
لا	نعم	من السهل الوصول الى الساحة والمسجد والمكتبة و صالة الرياضة في المدرسة.	18
لا	نعم	يسمح لي بتغيير طريقة ترتيب الأثاث في فصلي المدرسي.	19
لا	نعم	أنا على علم بكل جزء في المدرسة وطريقة الوصول إليه.	20

أرجو تزويدنا بأية ملاحظات أو توصيات تهدف لتطوير تصميم وشكل وتجهيزات مدرستك و فصلك المدرسي :

....
....
....
....

وشاكرن لكم حسن تعاونكم

3.   Techers questionnaire

التاريخ :   ....
إسم المدرسة: ....   إستـاذ مـادة   ....

ملخص الدراسة:

هذه الدراسة تهدف إلى التعرف على الجوانب المؤثرة لتصميم البيئة التعليمية في المدارس الحكومية في دولة الكويت، بالإضافة إلى تقييم مستوى أداء وتفاعل الطلبة والمعلمين مع البيئة التعليمية في المدارس الحكومية؛ من حيث جودة تصميم البيئة البنائية و الاجتماعية والمدرسية وتفاعلها مع بعضها البعض. وأيضا توافر المتطلبات الأساسية للحصول على بيئة تعليمية جذابة و هادفة تحرص على تلبية متطلبات المتعلمين والمعلمين والعملية التعليمية. و يتلخص الهدف الأساسي لهذه الدراسة في إيجاد السبل والوسائل التي ترتقي بالتصميم المعماري والداخلي للمدارس الحكوميـة في دولـة الـكويت؛ ممـا يؤدي الى تطوير جودة التعليم ودفع عجلة التنمية والتطوير في الخدمات التعليمية في دولة الكويت. لذلك نأمل منكم التكرم بالمشاركة في هذا التقييم الذي يقيس بعض الجوانب المذكورة في تصميم البيئة التعليمية للمدارس الحكومية بدولة الكويت.

الإرشادات:

عزيزي المعلم الفاضل, يرجى وضع دائرة على الخيار الذي تره الأنسب وفقا لرأيك وشعورك في مدرستك وفصلك المدرسي وفقا للقياس التالي:

4. ممتـاز.   3. جيـد .   2. مرضى.   1. ضعيف جدا أو معدوم

ضعيف جدا	مرضى	جيد	ممتاز		
1	2	3	4	المعلم يعامل بسياسة تكافؤ الفرص مع زملائة المعلمين والإداريين في المدرسة.	1
1	2	3	4	المعلـم لديه إحاطة كاملة بالقوانين والأحكام المتعلقة بالمـدرسـة.	2
1	2	3	4	المعلم حريص على تطوير البيئة التعليمية.	3
1	2	3	4	المعلم ملم بالواجب والدور الذي يقوم بـه في المـدرسـة و العـملية التـعليمية.	4
1	2	3	4	المعلم يبلغ أولياء الامور بالإنجازات والتطورات التعليمية السلوكية التي تتعلق بأبنائهم بشكل دوري.	5
1	2	3	4	أولياء الامور يثـقـون بأن التعليم والسلوك الاخلاقي لأبنائهم في المدرسة على مستوى جيد.	6
1	2	3	4	هناك تعاون عادل و واضح بين المعلمين والإداريين لمواجهة كل الصعوبات التي تواجه المدرسة.	7
1	2	3	4	القوانين والشروط الخاصة للمعلمين والإداريين موضحة ومشروحة.	8
1	2	3	4	المعلم ملم بالهدف الأساسي للبيئة المدرسية والوظيفة المكانية والاجتماعية والتعليمية للمدرسة.	9
1	2	3	4	الممرات والسلالم في المدرسة آمنة ومراقبة.	10
1	2	3	4	المعلم والطالب يتنقل ويتحرك بسلاسة وانتظام بين أركان المدرسة.	11
1	2	3	4	توفر المدرسة نشاطات خاصة لتطوير النمو و السلوك الاجتماعي للطلاب وهواياتهم.	12
1	2	3	4	هناك قوانين ونظم فعالة لتسوية المشاكل والنزاعات التي تواجه الطلبة داخل وخارج المدرسة.	13
1	2	3	4	المعلم على إلمام كاف عن سياسة التعليم والتدريس في المدرسة.	14
1	2	3	4	الفصول المدرسية مكان جميل للتدريس.	15
1	2	3	4	الإضاءة جيدة في الفصول الدراسية ولا يوجد هناك وهج ضوئي يزعج المعلمين والطلبة.	16
1	2	3	4	الفصول المدرسية تخلو من الإزعاج الخارجي.	17
1	2	3	4	الوصول لدورات المياة الخاصة للمعلمين سهلة و متوفرة بكل أركان المدرسة .	18
1	2	3	4	هناك مساحة كافية للتحرك والمناقشة في الفصل المدرسي.	19

1

1	2	3	4	الأثاث الفصلي منظم على الطريقة المثلى لتشجع الطلبة على التركيز في الدرس.	20
1	2	3	4	الوسائل التعليمية والأجهزة الإلكترونية متوفرة ومقسمة على الفصول الدراسية ومن السهل الحصول عليها.	21
1	2	3	4	مستوى صوت المعلم والاجهزة التعليمية في الفصول الدراسية مناسبة وتساعد على التركيز.	22
1	2	3	4	المعلم لديه مساحة عمل وتخزين كافية في المدرسة.	23
1	2	3	4	المعلم يستطيع النظر ومراقبة جميع الطلبة بسهولة في الفصل المدرسي.	24
1	2	3	4	الأثاث المدرسي في حالة جيدة ونظيفة.	25
1	2	3	4	هناك خزائن كافية وصالحة للمعلمين في المدرسة.	26
1	2	3	4	يوجد في الفصول الدراسية مساحات خاصة لعرض أعمال الطلبة وإنجازاتهم.	27
1	2	3	4	المعلم لدية الصلاحية لتغيير الترتيب في الفصل المدرسي.	28
1	2	3	4	المعلم يشجع الطلبة على تطوير الفصل المدرسي ترتيبة بشكل جذاب.	29
1	2	3	4	المعلم يحرص على تغيير ترتيب الفصل المدرسي بشكل دوري.	30
1	2	3	4	تحرص وزارة التربية على التركيز على جودة البيئة التعليمية.	31
1	2	3	4	عدد الطلبة في الفصل الواحد مناسب ويساعد المعلم على السيطرة على سير العملية التعليمية.	32
1	2	3	4	المعلم راض عن درجة حرارة الفصول المدرسية.	33
1	2	3	4	مسموح للطلبة تطوير وتغيير تنسيق فصلهم الدراسي.	34
1	2	3	4	المعلم يدرك بأن تنسيق الفصل المدرسي يرتبط باستراتيجية التدريس والمنهج الدراسي .	35
1	2	3	4	جودة الديكور والصبغ في المدرسة جيدة.	36
1	2	3	4	يدرك المعلم أن لكل مادة خصوصية معينة من حيث تنسيق وترتيب الفصل المدرسي وما لها من تاثير على الطالب.	37
1	2	3	4	المعلم يرى أن المدرسة بيئة مناسبة للتعليم والتربية الاخلاقية والاجتماعية.	38
1	2	3	4	المعلم حريص على تغيير مكان التدريس بين الحين والاخر بعيدا عن الصف المدرسي.	39
1	2	3	4	هناك تشجيع ودعم من الإدارة المدرسية للإهتمام بتطوير البيئة التعليمية وجعلها جذابة.	40

أرجو تزويدنا بأية ملاحظات أو توصيات تهدف لتطوير البيئة التعليمية، وبالأخص التصميم المعماري والمكاني للمدرسة والفصول المدرسية من حيث خبرتك وتجاربك العلمية والتعليمية :

....
....
....
....
....
....
....
....

وشـاكـرين لكـم حسن تعـاونكم

4. School administrator Questionnaire

.... التاريخ :

(مدير ـ مدير مساعد) مدرسة :

ملخص الدراسة:

هذه الدراسة تهدف إلى التعرف على الجوانب المؤثرة لتصميم البيئة التعليمية في المدارس الحكومية في دولة الكويت، بالإضافة إلى تقييم مستوى أداء وتفاعل الطلبة والمعلمين مع البيئة التعليمية في المدارس الحكومية؛ من حيث جودة تصميم البيئة البنائية و الاجتماعية والمدرسية وتفاعلها مع بعضها البعض, وأيضا توافر المتطلبات الأساسية للحصول على بيئة تعليمية جذابة وهادفة تحرص على تلبية متطلبات المتعلمين والمعلمين والعملية التعليمية. و يتلخص الهدف الأساسي لهذه الدراسة في إيجاد السبل والوسائل التي ترتقي بالتصميم المعماري والداخلي للمدارس الحكومية في دولة الكويت؛ مما يؤدي إلى تطوير جودة التعليم ودفع عجلة التنمية والتطوير في الخدمات التعليمية في دولة الكويت. لذلك نأمل منكم التكرم بالمشاركة في هذا التقييم الذي يقيس بعض الجوانب المذكورة في تصميم البيئة التعليمية للمدارس الحكومية بدولة الكويت.

السيد مدير المدرسة(مدير مساعد) الفاضل ، يرجى المشاركة في هذه الاستبانة عن طريق اختيار الخيار الأنسب للأسئلة التالية ، وفقا لرأيك وخبرتك في المدرسة وجودتها , وأرجو إضافة أي معلومات تتعلق بالسؤال إن وجدت في الفراغ الموجود أسفل السؤال:

1   قبل كم عام تأسست المدرسة؟

أ- 40-49 سنة   ب – 30-39 سنة   ج- 20-29 سنة   هـ - 10-19 سنة   د – اقل من 10 سنوات

ملاحظات: ....
....

2   متى تم تجديد وترميم المدرسة؟

أ – قبل 20 سنة .   ب – قبل 15 سنة   ج – قبل 10 سنوات   هـ ـ قبل خمس سنوات   د – أقل من سنة.

ملاحظات: ....
....

3   ما هو حجم النوافذ في كل فصل دراسي؟

أ-   حجمها كبير ومناسب ، وتعطي إضاءة كافية للفصل.

ب- صغيرة الحجم وتعطي إضاءة قليلة للفصل.

ت- صغيرة جدا ولا تعطي إضاءة كافية للفصل.

ملاحظات: ....
....

4   ما هو نوع الأرضيات الموجودة في معظم أجزاء المدرسة؟

أ-   خشب (باركية)

ب- أرضيات صناعية أو طابوق.

ت- مفرش (سجاد).

ملاحظات: ....
....

5   هل يوجد في كل فصل دراسي جهاز منظم للحرارة؟

• نعم   • لا

ملاحظات: ....
....

6   هل هناك أجهزة تكييف خاصة بكل فصل دراسي ؟

• نعم   • لا

ملاحظات: ....
....

1

7   متى تم تجديد أو ترميم ديكورات الساحـات الـداخـليـة للمدرسـة والـفصـول الـدراسـية؟
    أ- أكثر من 10 سنوات.   ب- بين 5 الى 10 سنوات.   ت- أقل من خمس سنوات
ملاحظات:
....
....

8   متى تم تجديد أو ترميم ديكورات الساحات الخارجية للمدرسة ؟
    أ- أكثر من 10 سنوات.   ب- أكثر من 10 سنوات.   ث- أقل من خمس سنوات
ملاحظات:
....
....

9   كم مرة يتم تنظيف الأرضيات وكنس الفصول الـدراسـية؟
    أ- شهريا   ب- اسبوعيا   ت- يوميا
ملاحظات:
....
....

10 هل يوجد أثر للكتابة على الجدران في المدرسة من قبل الطلاب؟ حدد **نعم** أو **لا** بكل منطقة مصنفة:
    دورات المياة   نعم   لا
    الخزائن   نعم   لا
    الممرات   نعم   لا
    الفصول   نعم   لا
    الحوائط الخارجية للمدرسة   نعم   لا
    الملاعب والساحات   نعم   لا
    أخرى ....
ملاحظات:
....
....

11 ما هي المدة التي تبقى بها الكتابة على الجدران قبل إزالتها؟
    أ- حتى فترة الصيانة الدورية القادمة   ب- في حدود 4 اسابيع.   ت- أقل من اسبوع واحد
    (الصيف).
ملاحظات:
....
....

12 ما هي صلاحية الخزائن المخصصة للطلبة؟
    أ- معظم الخزائن غير صالحة للاستخدام وتحتاج إلى تصليح
    ب- فقط 50% من الخزائن صالحة للاستخدام وبحالة جيدة.
    ت- أكثرية الخزائن صالحة للاستخادم وبحالة ممتازة.
ملاحظات:
....
....

13 ما هي المادة أو الخامة المستخدمة بتغطية أسقف الفصول المدرسية؟
    أ- خشب
    ب- أسقف صناعية أو جبس.
    ت- كونكريت.
ملاحظات:
....
....

2

14   ما نوع الإضاءة المستخدمة في الفصول المدرسية ؟
     إضاءة متوهجة (سبوتلايت) Incandescent light
     إضاءات نيون(فلوريسنت). Fluorescent light
     ملاحظات:
     ....
     ....

15   ما هي جودة وحالة الأثاث الفصلي في المدرسة؟
     أ‌ـ   معظم الاثاث تالف وغير صالح للاستخدام.
     ب‌ـ معظم الاثاث به تلف جزئي ولكن صالح للاستخدام.
     ت‌ـ كل الاثاث بحالة ممتازة جدا وجذابة للطلبة.
     ملاحظات:
     ....
     ....

16   ما هي الألوان المستخدمة في الفصول والمختبرات الدراسية؟
     أ‌ـ   درجات الألوان داكنة (غامقة).
     ب‌ـ أبيض
     ت‌ـ درجات الألوان الفاتحة.
     ملاحظات:
     ....
     ....

18   هل المدرسة تقع في مكان مزدحم, أوقريبة من الطرق السريعة والمطار، أو تعاني من نسبة عالية من الازعاج الخارجي؟
     أ‌ـ   نعم ، هناك ازعاج كبير بالمدرسة ولم نتخذ أي اجراء لتقليل هذا الإزعاج.
     ب‌ـ نعم ، هناك إزعاج بالمدرسة وقد قمنا باتخاذ إجرءات لتقليل هذا الازعاج . (اذكر بعضها بالملاحظات)
     ت‌ـ لا ، ليس هناك أي إزعاج من الخارج.
     ملاحظات:
     ....
     ....

19   ما هي جودة المدرسة من حيث البناء والإنشاء من الناحية التجميلية والمعمارية؟ مع ذكر السبب بالملاحظات
     أ‌ـ   أقل من المستوى الطبيعي.
     ب‌ـ بالمستوى الطبيعي.
     ت‌ـ أعلى من المستوى الطبيعي.
     ملاحظات:
     ....
     ....

20   أي نوع من تنسيق الكراسي والطاولات في الفصول المدرسية تكون عادة وبشكل يومي؟
     أ‌ـ   نظام الصفوف التقليدية(خطوط عمودية).
     ب‌ـ نظام الدائري او المربع.
     ت‌ـ نظام المجاميع التعاونية (قروبات)
     ملاحظات:
     ....
     ....

21   ما هي استيعابية الطلاب بكل فصل دراسي؟
     أ‌ـ   أكثر من 25 طالب.
     ب‌ـ بين 15 الى 25 طالب.
     ت‌ـ أقل من 15 طالب.
     ملاحظات:
     ....
     ....

3

22 هل يجب على الطلاب الحصول على إذن قبل تغيير ترتيب فصلهم الدراسي؟
    أ-   نعم, يجب أخذ إذن من المعلم والإدارة المدرسية وبعدها من الوزارة.
    ب-   نعم , يجب أخذ إذن من المعلم والإدارة المدرسية فقط.
    ت-   لا , لهم الحرية في ترتيب فصلهم الدراسي وفق الضوابط العامة في المدرسة.
    ملاحظات:
    ....
    ....

23 هل هناك تشجيع ودعم للطلبة على تطوير فصولهم التعليمية؟
    أ-   لا , ليس هناك اي دعم وتشجيع.
    ب-   نعم ، في حالة أبدى الطلبة رغبتهم بذلك.
    ت-   نعم, هناك تشجيع وجوائز خاصة للفصول المتميزة
    ملاحظات:
    ....

24 هل هناك سياسة وأهداف واضحة للوظيفة الرئيسية للمبنى المدرسي من الناحية البنائية والإجتماعية والتربوية؟
    أ-   لا
    ب-   نعم ، هذه الأهداف موجودة بسياسة المدرسة لكن غير منشورة وموزعة لجميع الطلبة والمعلمين.
    ت-   نعم ، هذه السياسة منشورة ومعروفة للجميع.
    ملاحظات:
    ....
    ....

25 هل توفر المدرسة وسائل الراحة والترفيه للمعلمين في أوقات فراغهم؟
    •   نعم   لا
    ملاحظات:
    ....
    ....

26 هل تحرص وزارة التربية على تقييم جودة البيئة التعليمية بالمدرسة من خلال زيارات دورية تقيس بها جودة المباني المدرسية وصلاحيتها؟
    •   نعم   لا
    ملاحظات:
    ....

❖ أرجو تزويدنا باي ملاحظات أو توصيات للنقاط التي أثيرت في هذه الاستبانه وأيضا بخصوص التقييم الخاص لجودة المدارس من الناحية المعمارية والإنشائية والتربوية وبيان مدى تفاعل المعلمين والطلبة مع البيئة التعليمية وجودتها:
....
....
....
....
....
....
....
....
....
....

                    وشاكرين لكم حسن تعاونكم وجهودكم