Northumbria Research Link

WHAT ART CLASSROOM AND SOCIAL FACTORS INFLUENCE PERCEPTIONS OF CREATIVE THINKING AND PRACTICES OF ADOLESCENT GIRLS IN SAUDI ARABIA?

Abeer Abdulaziz Alawad
HND, BA (Hon's), MA

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Abstract

In the increasingly popular area of research into creativity in education; students' perceptions of creativity are an important consideration for developing a creative environment. Consequently, student's perceptions of creative thinking and practice are a key resource for educators to be innovative in creating educational excellence. The purpose of this study was to investigate students' perceptions about their art classroom environments which either stimulate or inhibit the development of creative thinking and practices, in girls' intermediate schools (12-15 years) in Jeddah, Saudi Arabia. It addresses the following research question: *Is it possible to improve perceptions of creative thinking and practices, of adolescent girls in Saudi Arabia, through control of art classroom environments?*

There were three parts to this study: firstly, the pre-intervention study to explore and identify a range of factors with potential to influence perceptions of creative thinking and practices; secondly, the main part of the study was the intervention to determine the impact of manipulating classroom variables with potential to influence perceptions of creative thinking and practices; and thirdly, follow up visits to determine whether the environmental changes, and the changes in perceptions, had continued. The samples used in the intervention study were students (n = 225) all from second year classes in nine secondary schools in Jeddah, Saudi Arabia. The research findings were obtained by observation using behaviour mapping and Likert-scale questionnaires indicated that students' perceptions of creative thinking and practices were improved through changing table and seating arrangement and wall displays.

The contribution to new knowledge in this study will inform participants working within and related to the field of education and in particular art education, proposing considerations for appropriate improvements to learning environments by:

- Developing a research process for identifying and testing environmental influences upon the perception of creative thinking and practices.
- Evidencing how table and seating arrangement, and wall display, can improve perceptions of creative thinking and practice in Jeddah, Saudi Arabia.

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Dedication

This work is dedicated proudly to my mother Monira, my mother-in-law Moudhi for their support and prayers during the period of the study. It is also dedicated to the spirit of my father Abdulaziz and, with all my respect and love, to my husband Ayman and my children Abdulaziz and Waddah, to whom I am beholden for all my success. In addition, I will not forget to dedicate this work to my friends for their continued encouragement.

Declaration

I declare that the work contained in this thesis has not been submitted for any other award and that it is all my own work.

Name: Abeer Abdulaziz Alawad

Signature:

Date:

Chapter One: Introduction

1.1 Introduction

In the increasingly popular research area of creativity in education (Fleith, 2000) a student's perception are the key to develop an effective learning environment (Mayya and Roff, 2004). Consequently, I propose that student's perceptions of creative thinking and practice are then an important resource for educators to be innovative in creating educational excellence. Art education is one of the most important subjects that can help to develop a student's creativity (Alhilah, 2002).

The Kingdom of Saudi Arabia covers more than three-quarters of the Arabian Peninsula, approximately 2,240,000 square kilometres, with a population of approximately twenty eight million people. This doctoral programme of research investigating the possibility of improving perceptions of creative thinking and practices, through control of art classroom environments, was carried out in the city of Jeddah. The Kingdom of Saudi Arabia uses the same educational system in all its cities as used in Jeddah, but my research can only claim findings relating to its investigation of Art education in intermediate girls schools in Jeddah.

Art education is taught in primary schools, in conjunction with home economy, and at the intermediate level as an independent and compulsory subject with two sessions per fortnight and evaluated at the end of the academic year. At the secondary level, it is an optional subject (MoE, 2006).

Art is taught in specific classrooms (Department of Art Education, 2003), chosen by the head teacher, and often these are general teaching rooms, which may not have adequate facilities for art activities. Nevertheless, it was reported during the field studies that it was the teacher's responsibility to create and maintain the art classroom environment for effective learning experiences.

Art education in Saudi Arabia is focused on drawing and craft. The Art curriculum includes drawing, painting, and decoration of two-dimensional works of art, and three-dimensional production such as handiwork. Each year stage has different topics and a set curriculum. The curricula are issued by the Ministry of Education (MoE) and taught in all public and private schools. Each topic is comprised of three components: drawing, painting and producing

artistic work. At the end of the term, exhibitions are held by specific schools and sometimes by a group of schools. Artworks are returned to the students following evaluation or after a period of display at the student's school (Department of Art Education, 2003).

The resourcing of art classroom facilities for learning and display is covered by overheads, but the consumables are provided through a separate more limited budget. The budget for art education in the MoE is sent to the head of school and she will give it to the art teacher to buy appropriate equipment to assist in delivering the subject (MoE, 2006). This budget is usually just for tools or materials and not enough to make a major change, for example with the furniture. It was reported during the field study that it is the student's responsibility to provide materials, but teachers often provide some materials as well. Motivation to buy materials and enable opportunities for creative development can be influenced by perceptions of the value of art practices. For example, if parents do not encourage their children to do art work, and instead suggest that subjects such as mathematics are more important than art, such social influences may negatively affect children's perceptions of creative thinking and practices.

The Government provides support and additional funds to private schools, so with tuition fees for each student being high, this enables the classrooms and buildings to be kept in a better quality condition. The private schools can choose the staff they want and are not bound by regulations unlike the public schools (MoE, 2006). It was also reported during the field study that private schools can sack or hire teachers whenever needed. They have to ensure the students are satisfied with the facilities or they may lose the students. Here education is treated as a business.

From the perspective of 13 years experience of teaching art in Saudi Arabia I can report that some school officials underestimate art education and view it as a minor subject. This can have negative consequences on the value of art education, the ways it is taught for teacher training courses and even the way it is taught in schools (Al-Sonbol et al, 1998). When I taught at an intermediate school in Jeddah, I observed that art teachers were less valued compared to teachers from other subjects. In some schools they use art classrooms for events such as parents' day or art training which means the art teacher has to teach in a standard classroom. In addition, the art class is normally selected to be the last subject of the day, a time of day that is more likely to suffer cancellation if there is a problem. Therefore, some art

teachers have complained to the school administrators that they do not treat art education as being equal to other subjects.

Nevertheless, art carries the same credits as Math or Science, and this is an important consideration for motivating student learning behaviours. The assessment of art education in intermediate schools, taken from the MoE states that assessments for artwork are as follows: for pencil drawing (up to 12 marks); for painting (up to 12 marks); for class engagement including interaction, behaviour (up to 6 marks); and completion of whole project (up to 20 marks), this amounts to around 10% of marks per semester (Department of Art Education, 2003). So in terms of marks art may be considered equal, however it may be considered by some as less equal in terms of what professional opportunities it may open up for these students however, the future opportunities for those students who enjoy art may include possible futures in teaching and interior design. Such ambitions can motivate development of creative thinking and practices within the learning environment.

1.2 Statement of the Problem

The MoE is making a special effort to improve education in the Kingdom, including art education. Therefore, this study will provide impetus for the MoE to further explore the importance of art classroom environment, and factors that may influence perceptions of creative thinking and practices of intermediate girls' schools.

A key objective of this study is to identify art classroom and social factors that influence perceptions of creative thinking and practices of intermediate (12-15 years) girls' schools in Jeddah, Saudi Arabia. The outcome of this research will be based on evidence from my observations, interviews, and questionnaires. As part of this study some practical guidance is given for art teachers to develop more effective art classroom environments in order to improve students' perceptions of facilitating the creative thinking and practices.

1.3 Author Background and Motivation

To contextualise my interest in this topic, I am an art teacher with a Saudi Arabian Diploma in 'Art and Design'. I taught art for thirteen years in girls' intermediate schools in Jeddah, Saudi Arabia, and I have a BA and an MA in Design Management. As a teacher, I worked with different schools at the same level teaching art and observed that students held different perceptions of their art classroom environment. I have used this experience to inform my

research process. Experience has shown me that there are special requirements distinguishing the art classroom from the general classroom and these include: size, ventilation, lighting, layout and display factors, which may influence perceptions of facilitating the creative thinking and practices.

There were three parts to this study: firstly, the pre-intervention study to explore and identify a range of factors with potential to influence perceptions of creative thinking and practices, as the independent variables; secondly, the main part of the study was the intervention to indicate the impact of manipulating classroom variables with potential to influence the dependent variable of perceptions of creative thinking and practices; and thirdly, follow up visits to determine whether the environmental changes, and the changes in perceptions, had continued. It was important to ensure that this research had clear value to the art educator.

1.4 Importance of the Study

This study will help inform the MoE's considerations of further exploration of factors of influence on art classroom environments that may improve perceptions of creative thinking and practices of intermediate girls' schools.

This doctoral project is an initial investigation within this area, with a limited timeframe that has influenced the choice of appropriate methods used. Whereas future post-doctoral research may have time for further reaching in-depth investigation, using quantitative methods, this programme of research has used a qualitative approach.

Although it is recognised that some aspects of this qualitative research will not have replicability because of the specific context, this study's findings will be useful for the following groups of people in the education field in Saudi Arabia:

- *Educational Authorities:* This study seeks to support engagement from the MoE planners in the art department in Riyadh city as the MoE centre, by specifying the research process developed for identifying environmental influences on perceptions of creative thinking and practices. In addition, it aims to empower them to enrich the environment, making better use of existing spaces within whatever constraints exist, and consider it in their future expansions; as well as, to facilitate and encourage a constructive interplay between teachers, designers and regulators.

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- *Teacher Training Institutions:* When teacher training institutions are equipped with information on the art classroom environment, trainee teachers will be well placed to create stimulating art environments.
- *School Management:* Administrators in school management can use the results of this study to consider more broadly the development of art environments conducive for teachers to support student learning experiences of creative thinking and practices.
- *Teachers:* By providing guidance concerning elements that can influence art classroom environments, teachers may be better able to manage the art classroom environment.

1.5 Research Questions

The research question for this study provided a basis for planning the work and the methods to be applied:

Is it possible to improve perceptions of creative thinking and practices, of adolescent girls in Saudi Arabia, through control of art classroom environments?

This main question led to several secondary questions:

1. What are the classroom environmental factors that need to be considered?
2. How are classroom environmental factors rated in order of perceived importance of influence upon creative thinking and practices by students?
3. In what ways do the students perceive that the Art classroom helps them in performing their tasks?

Questions associated with the classroom's set features:

1. Who is responsible for designing art classrooms, windows, doors, room shape and size, and additional facilities?
2. How important is the design of art classrooms to the influence of students' perceptions of creative thinking and practices?

Questions associated with the classroom's modifiable features:

1. What guidance do teachers receive to arrange and organise their classroom environment?

2. Are there any limitations on what teachers may do to control and manage the art classroom?

3. What do the students and teachers need from the art classroom environment to improve their creative thinking and practices?

These questions, led to the development of research instruments that will be described in the following chapters. The focus of this study was mainly on the students and their relationship within the art classroom environment, as supported by the context of the literature review. Data were gathered through lesson observations in art classroom environments, interviews with students and teachers, and questionnaires in the pre-intervention study. This investigation informed the further understanding of 'environmental factor influences' on perceptions of creative thinking and practices.

1.6 General Aims and Objectives

The aim of this programme of research was to use a pre-intervention, intervention, and follow-up visit method of study to explore and identify a range of factors with potential to influence perceptions of creative thinking and practices of intermediate (12-15 years) girls' schools in Jeddah, Saudi Arabia.

In pursuit of this aim, there were seven objectives:

1. To carry out a contextual review of classroom and workplace environments.
2. To evaluate the current situation in art classrooms in Saudi Arabian girls' intermediate schools.
3. Explore what significant factors within the art classroom could influence perceptions of creative thinking and practices.
4. To choose appropriate factors that could potentially influence perceptions of creative thinking and practices.
5. To select and manipulate selected factors and test their influence on perceptions of creative thinking and practices.
6. To analyse all data and draw conclusions concerning the significance of the art classroom environment in influencing perceptions of creative thinking and practices.
7. To make recommendations for future research in this field.

1.7 Definition of Terms

The definitions I offer are not considered to be the only way to understand these concepts, but nevertheless serve to clarify what I mean by the terms, to aid reader's comprehension.

- **Learning environments:** The term learning environment in this research includes all surroundings in the art classroom environment that may affect students' behaviour. Hiemstra, (1991, p.8) defines the learning environment as 'all of the physical surroundings, psychological or emotional conditions, and social or cultural influences affecting the growth and development of [a person] engaged in an educational enterprise'. This definition was chosen as it is all encompassing and acknowledges the many factors within the learning environment.

- **Creativity:** There are many definitions of creativity discussed later in this thesis. However, Santrock (2004, p.294) defined creativity as 'the ability to think about something in novel and unusual ways and come up with unique solutions to problems'. This is closest to my own understanding and use of the term, and this thesis argues that creativity involves discovery of new and valuable ideas, concepts or links of the creative mind between existing ideas or concepts.

- **Perceptions:** The act of perception involves conscious mental awareness. When you perceive something you receive information by your senses or intellect. Perception also means the representation of what is perceived and it is a way of conceiving something (Kostek, 2005). In this study perception refers to what the pupils believe and understand about their art classroom environment as a creative space.

1.8 Limitations of the Study

Saudi schools are separated by gender for cultural reasons, and therefore this research was limited to girls' intermediate schools and so does not address boys' intermediate schools.

While I studied for my PhD at Northumbria University in the United Kingdom, my field studies took place back home in Jeddah, in the Kingdom of Saudi Arabia. The timing of the field trips was limited by the term times of the intermediate schools, and also in duration of the active research period of my programme, which was around 18 months.

There were financial constraints to consider for my active research, in terms of the facilitation of the interventions. For example, the schools could not all afford to buy new furniture.

There were also issues around access to the schools in Jeddah. It was not simply a case of getting government permission, the Heads of Schools, and teachers also had to give consent for the visits and interventions. In addition, there were the challenges of distance between collaborating schools.

Some schools were over forty miles apart, which could take over two hours to cover depending on traffic conditions, and in Saudi Arabia women are not allowed to drive, so there is a dependency on drivers who often have busy schedules.

1.9 Organisation of the Thesis

The research is organised into eight chapters.

Chapter Two is a contextual review that presents a definition and discussion of aspects of creativity. It considers also the influence of perceptions of creativity, and goes on to provide an overview of research into environmental psychology and the learning environment. The issue of developing creativity in education is also described, including a brief exploration of art education in Saudi Arabia as well as a focus on issues related to adolescent girls studying in this country. Finally, the classroom design elements are systematically reviewed and the chapter identifies the need for research in this area.

Chapter Three reviews methods from related areas of research, and then describes the research design with the mix of approaches that were chosen in developing the appropriate tools for this research. This chapter also presents the reasons behind methodological decisions made.

Chapter Four describes the pre-intervention study through observations, interviews, questionnaire, and the analysis of the data collected to inform the main intervention study. It starts with a general overview of the observations then analyses each classroom in detail focusing on classroom design elements. Then the chapter considers the interviews involving art teachers and students. The chapter concludes with the ranking of classroom elements, providing an awareness of perceived importance of design elements.

Chapter Five describes the intervention method. This chapter begins with the selection process of the schools involved in each group, the criteria used to test the changes, and also the follow-up visits.

Chapter Six presents the data analysis and discussion using visual presentations to aid comprehension of the findings. It discusses the meaning of these findings in terms of how they can inform and direct educators and researchers to improve perceptions of creative thinking and practices, through environmental factor manipulation.

Chapter Seven considers remaining gaps in knowledge and the future opportunities in this area of research and makes recommendations for further research.

Chapter Eight concludes this thesis, describing the benefits of this study and its contributions to new knowledge.

Chapter Two: Contextual Review

2.1 Introduction

The purpose of a review of context is to provide the reader with an understanding from both literature and practise as a strong and clear foundation of support to the argument in defence of the thesis. The contextual review, like the study of methods in the next chapter, is organised somewhat like a funnel of knowledge, establishing a focus. In this chapter this requires a discussion of: definitions and aspects of creativity; the influence of perceptions of creativity; the influence of the learning environment; cultural issues specific to Jeddah in the Kingdom of Saudi Arabia; and a summary of needs as identified gaps in knowledge in this subject.

2.2 Definitions and Aspects of Creativity

Creativity is fundamental to society and is one of the most complex human behaviours: Creativity consists of at least four inter-related elements. Firstly, the creative process, secondly, the creative product, thirdly, the creative person, and finally, the creative situation (MacKinnon, 1970; Mooney, 1963).

Creativity has been viewed as an aspect of intelligence and an unconscious process. Vernon (1989) suggests the following general definition of creativity:

> 'Creativity means a person's capacity to produce new or original ideas, insights, restructurings, inventions, or artistic objects, which are accepted by experts as being of scientific, aesthetic, social or technological value. In addition to novelty as our major criterion, we must incorporate in our definition the acceptability or appropriateness of the creative product, even though this valuation may change with the passage of time' (Vernon, 1989, p. 94).

Torrance's work is internationally recognised for contributions to understanding of testing creative capacities, especially with children in artistic activities like drawing (Cropley, 2000). Torrance made an important point that creativity is important to mental well-being saying that 'creativity is our most important weapon in coping with life's daily stresses, its emergencies and crises' (Torrance, 1995, p. 15). This suggests that our creative capacities and expression may be part of how we experience both the physical and social environments that we work in.

Within the field of creativity, there are numerous approaches that focus on different aspects of its practice. Most definitions of creativity focus on the mental ideation and/or physical exploration prior to the critical testing and selection of concepts or solutions, as a separate function:

> 'Creative thinking is expansive, innovative, inventive, unconstrained thinking. It is associated with exploration and idea generation. It is daring, uninhibited, fanciful, imaginative, free-spirited, unpredictable and revolutionary' (Nickerson, 1999, p.397).

Another important researcher contributing to our understanding of educational creativity is Balkin, who is a professor of education, a composer, and the coordinator of the Integrated Creative Arts Program in the College of Education at Western Michigan University, Kalamazoo. According to Balkin (1990), creativity can also be defined as both the art and the science of thinking and behaving with both subjectivity and objectivity. It is a mixture of feelings, of what we sense and what we already know. Creativity is a conscious act with at least one motive or purpose, whether it is to express feelings to self or others, or to provide solutions for self or others. Santrock (2004,p.294) defined creative thinking as 'the ability to think about something in novel and unusual ways and come up with unique solutions to problems'. There is particular interest in the development of creative abilities in children, where development has been observed to be influenced by both the needs of the individual and the demands of their society. As a result, each individual should have the opportunity to realise his or her full potential as early in life as possible (Pankove, 1966).

Creative thinking requires imagination and may lead to many possible answers or ideas to a problem or opportunity. Creativity does not take place in a vacuum, it requires stimulus (Fisher, 2005). These stimuli will be external in terms of the local environment and experiences; and/or internal in terms of past experiences and intuition.

Creativity is 'the process of finding and implementing new and appropriate ways of doing things' (Best and Thomas, 2007,p.27). It can also be defined as the production of new and useful ideas in any field, while innovation can be defined as the successful implementation of those ideas creating change within an organisation, and opportunity for economic benefit. Therefore, creativity by individuals and groups is a starting point for innovation (Amabile *et al.*, 1996).

Brin Best, an education consultant, writer and trainer, and has co authored work on creativity with Will Thomas, who is a training consultant and performance coach. Best and Thomas (2007) argued that creativity is related to every facet of human study and learning, and presented some benefits of the importance of creativity to:

- Individuals: a human trait that defines the human species and provides a sense of completeness and purpose.
- Society: encourages diversity, connection and energy in human culture.
- Economy: provides the competitive edge in generating wealth, improving standards and quality of life.
- Environment: preserving and improving the natural and built environment, in addition to seeking the balance when conflicts of interest arise.
- Education: allowing a person to find solutions to solve problems and develop the imagination that will be required throughout their changeable lives.

(Best and Thomas, 2007,p 35)

The creative process starts with a concept; this requires a completely open mind and the ability to think laterally (De Bono, 1973). For some people, exercise and fresh air will help the process. For others, inspiration might come while drinking a glass of fresh juice and listening to the gentle strains of classical music. Inspiration can come from a variety of sources. Taste, smell, sounds and vision can all play a part in concept development (Gibbs, 2005). Therefore, our lives may be filled with the creative moments, as long as we are flexible and open to new possibilities and willing to push beyond the routine (Goleman *et al.*, 1993).

Internal origination can involve conscious, semi-conscious, and sub-conscious creative thinking (Csikszentmihalyi and Sawyer, 1996). The individual may be aware of mentally constructing ideas or solutions, or experiencing the moment an insight/solution pops into their mind. Creative externalisation can also be a conscious, semi-conscious, and sub-conscious practice. The individual may make what they have originated in their mind; or may gain insights through explorative play experience via their hands as a direct line from their sub-conscious intuition. Both these internal and external experiences facilitate the development of individual and social perceptions of creative thinking and practice, through self-reflection and observation of others.

In support of this research and summary of the above, creativity is defined as: a consciously or sub-consciously originated experience, of individuals or groups, as novel thinking which may be observed in forms of creative practice involving trying new things, to meet the needs of the individual or society in providing appropriate new ideas or solutions to problems. The development of this openness to new experiences, perceptions, ways of thinking, and forms of expression is influenced by the quality of experiences in the formative years of a child's education. However, it should also be acknowledged that this definition, used to frame this research, may not be held by everyone, as individuals may hold different perceptions of what creativity is and how it is influenced.

Creative thinking may also be described as the willingness to take risks (Starko, 2005). People who are afraid to make mistakes may fail to learn (Goleman *et al.,* 1993). Hull (2007) and Anarella (1999) agreed that risk-taking is important when developing creativity, while others refer to it as an indicator that creative behaviour is occurring (Meador, 1999; Sternberg, 1999; Starko, 2005).

In review of the literature and other researcher's perspectives and definitions I considered that the most appropriate working definition in the context of this programme of research into perceptions of creativity and practice is Santrock's (2004, p. 294) 'the ability to think about something in novel and unusual ways and come up with unique solutions to problems'. This is because my working definition of problem solving includes creative expression.

2.3 The Influence of Perceptions of Creativity

While perception is used mainly with reference to the reception and interpretation of information from the body's senses, enabling the development of insights about environmental and social surroundings; perception as a cognitive function is also acknowledged to involve moods and motives as part of our sense-making processes (Gruber, 1996). Perception involves mental awareness that can be objective in terms of reception of information from the senses about the individual's experiences; and subjective in terms of belief as a form of personal or cultural filter of perception in the interpretation of information from the senses, however:

> 'Perception is a precondition to enjoyment, to learning, to growth, to freedom – hence to the qualities of experience that transform people from totally determined entities into open systems of self cultivating energy. It gives value to life by making each act

of perception a unique, objective experience' (Csikszentmihalyi and Rochberg-Halton, 1981, p. 246).

Perception, as a representation of what is perceived (Kostek, 2005) enables a means of conceiving not just what is but what could be, creatively facilitating the learning process beyond rote learning. Educational researchers are beginning to realise the importance of using students' perceptions in research and the relative ease of this method. Mayya and Roff stated that students' perceptions are a basis for modifying or improving the quality of the educational environment (Mayya and Roff, 2004). Frazer said that 'students are at a good vantage point to make judgements about classrooms because they have encountered many different learning environments and have enough time in a class to form accurate impression' (Frazer, 2000,p.139). So perception is understood to be a psychological aspect of the classroom environment and has a significant effect on students' learning (Fraser, 1986; Nair and Fisher, 2000; She and Fisher, 2002). Some researchers looked at the students' perceptions of teachers' behaviour and classroom dynamics which can affect the academic results and effectiveness of lessons. There is a lack of research into the perception of creative thinking. Creativity and people's perception of their own creativity is important because creativity can affect a person's overall achievement, self-esteem and sense of self-worth.

Gender can affect perception as was noted by Walberg and Anderson (1968). In their study they discovered that a good social climate is particularly important for females of high academic ability. Classroom characteristics do appear to affect learning but this will be dependent on a number of factors such as gender and/or personality (Walberg and Anderson, 1968). In my study the participants were female students attending intermediate schools.

Furthermore, there have been various investigations into perception such as differences between female and male science teachers' perceptions of their school environments in Taiwan (Huang and Fraser, 2009). Other research has revealed interesting relationships between the nature of the learning environment and grade level (Welch, 1979), class size in United States of America (Walberg, 1969b), gender difference in India (Mayya and Roff, 2004), subject matter in Israel (Khalil and Saar, 2009), type of school in USA (Trickett, 1978), and characteristics of the school-level environment in Australia (Fraser & Rentoul, 1980). This research demonstrates the importance of considering students' perceptions of creative thinking and practice in the art classroom. Art subjects enable students to feel free and be more creative, therefore the design and organisation of the environment should aim to

be conducive to this work. Student's perceptions of their environment are extremely important to their creative performance, and so observation and recording of these perceptions and behaviours would provide valuable insight into the requirements of effective learning environments.

In summary, the perceptions of creative thinking and practices are seen to be influenced by a range of psychological and physiological environmental factors, each of which may contribute to either the inhibition or encouragement of creative thought and expression. The key influencing factors from this review would appear to be: communication functions; objectivity in terms of working conditions; subjectivity in terms of individual opinions; gender; culture; and subject. This informed the development of the method for intervention discussed later.

2.4 The Influence of the Learning Environment

It is important to have a broad understanding of learning environments to help determine a classroom's climate and student perceptions. Perceptions are crucial especially with regards to key members of the school community such as parents, staff and local neighbourhood. It is particularly critical to record perceptions during the transition from one school grade to another. Especially when moving from elementary school to high school or from intermediate school to secondary school. This can be a scary proposition for many pupils and their own perceptions can affect school climate and pave the way for future generations to progress (Freiberg & Stein, 1998).

Feedback is crucial as it enables schools to invest wisely in the right teachers, textbooks and equipment. It also tells the school whether the students are responding to the learning environment and if it is having an impact in their lives. Further, even making minor changes in schools and classrooms environment can lead to significant improvements in experience (Freiberg 1998).

Viewing the classroom environment from the student's perspective is extremely beneficial for understanding the educational process (LaRocque, 2008; Mayya and Roff, 2004). More departments and schools now use the student voice as a way of getting a real view of the different factors that affect a student's school experience (Flutter and Rudduck, 2004). Due to their nature, affective factors like perception are very difficult to quantify. Fisher and Fraser

(1983) acknowledged that there was no real measurement of affective factors. They also noted that there may be a gap between how a student perceives their classroom to be and how they would like it to be (Fisher and Fraser, 1983). An individual pupil's interaction with their teacher and peers within the environment is important to their process of learning.

A number of studies including She and Fisher (2002) indicate that students do perform better when there is a strong match between the classroom environment perceived, and the environment preferred by the students. Therefore, it appears that students' perceptions of social and psychological aspects of the classroom are positively related to achievement. However, perception is an elusive concept and perceptions will vary from student to student. A student will not find their learning successful unless the perceived classroom environment matches the expected classroom environment (She and Fisher, 2002).

Interestingly, Fraser and Treagust's research used the CUCEI (College and University Classroom Environment Inventory) and this was given to 372 students in 34 classes and to 20 teachers. The research focused on seven psychosocial components: involvement, satisfaction, personalization, student cohesiveness, innovation, task orientation and individualisation. Findings showed that students seemed to prefer a more favourable classroom environment than the one they actually had (Fraser and Treagust, 1986).

Of particular relevance to this research is that studies in both primary and secondary science classrooms indicate that males and females perceive their classroom environment differently (Johnson and Johnson, 1991 and Nair and Fisher, 2000). Nair and Fisher study into higher education found that students prefer their classes to be more personalised, cohesive, task oriented and innovative than what they usually experienced in the classroom. They also found that girls perceive the classroom environment more positively than boys (Nair and Fisher, 2000). Johnson and Johnson (1991) showed that boys preferred competitive and individualised learning whereas girls prefer learning which involves group cohesiveness and cooperation. Girls' interests seem to be people based whereas boys like things and ideas.

A study conducted by Mayya and Roff, (2004), compared academic achievers and under-achieving students' perceptions in respect to their educational environment at Kasturba Medical College, India. It revealed that academic achievers had significantly more positive perceptions regarding teachers, environment and social self-perceptions compared to under-achievers. This indicated a type of self-fulfilling prophecy that once an expectation has been

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set and we will tend to act in ways that are consistent with that expectation. They suggested that more attention is needed to be given to the perceptions of students to improve their educational environment.

Fleith (2000) researched teacher and student perceptions of creativity in the classroom environment. The results were extremely interesting and relevant to my research as both the teachers and the students believed that a classroom environment that enhances creativity is one that gives students choices, is accepting of novel and different ideas, is a place to take risks, raises self-confidence and self-esteem and views the students' strengths and interests as important. Therefore an environment which inhibits creativity may be overly structured with controlling teachers who may ignore or punish ideas.

As this literature review indicates, recent classroom research into the area of perception has been focused on subjects such as science or computing. There is a lack of research into art education. Therefore, this present study has sought to focus on students' perceptions in the art classroom environment. Also, most of the studies on classroom environments have been carried out in Western learning contexts. There is a lack of research into art classroom learning environments in Saudi Arabia. Consequently this research aims to consider what art classroom and social factors influence perceptions of the creative thinking and practices of adolescent girls in Saudi Arabia?

2.5 Studies of the Learning Environment

Before undertaking a study of any environment, it is important to contextually define the term 'environment'. According to McMullan, (2002,p.94), the general definition of environment is very broad, as it means 'the global surroundings that affect our lives'. Conversely, Hiemstra (1991, p.8) contextually defines the learning environment as 'all of the physical surroundings, psychological or emotional conditions, and social or cultural influences affecting the growth and development of [a person] engaged in an educational enterprise'. An environment, its form and use, clearly have a significant impact on its occupants. The environment affects people's experiences, the way they learn or don't learn. It can also impinge on their feelings and how people integrate, communicate and relate to each other within their surroundings.

Rutter's (1979) study of London schools has been influential in this area of research. This early study claimed that effective schools were characterised by a number of factors. One of

these factors was the environment. There should be a good environment available for the pupils and this environment must be conducive to growth. The value of contributing new knowledge in this area is that the environment has a direct impact on learning; students learn better in a well-designed classroom and they can be distracted by a poorly designed space (Gifford, 1976). In addition, a well-designed environment reduces behavioural problems (Birren, 1988). A classroom considered to be attractive and comfortable by its students can stimulate learning and enhance the classroom community (O'Hare, 1998).

Wollin and Montagne (1981) found that achievement was related to the aesthetic appearance of a college classroom in USA. Student achievement and teacher performance were found to improve in a well-decorated and colourful environment, compared with students in a plain and monochromatic classroom (Wollin and Montagne, 1981). Previous studies in USA (Woodman *et al.*, 1993; Amabile *et al.*, 1996; Oldham and Cummings, 1996) have found that perceptions of work environments can also influence creative performance.

Coleman and Colbert (2001) cite two types of environments that may influence creativity: the physical and the emotional. In terms of emotion and particularly the atmosphere of trust, feeling secure and unafraid to express ideas can encourage creativity (Shallcross, 1981). Physical settings that encourage creativity include rooms with views containing a variety of objects and pictures that may stimulate creative thinking (Ward, 1969). One of the strategies that children use in tasks requiring creativity is that of scanning their physical environment (LaGreca, 1980). Therefore, displaying students' work in the classroom is also important, for reasons of both environment-scanning and self-esteem (Coleman and Colbert, 2001).

The physical environment of the school consists mainly of the buildings and other architectural features. The aspects that teachers can rearrange within this framework are items such as furniture and decor. Students' interaction with environmental factors can contribute positively or negatively to their learning experience. Each aspect has its own essential influence on their behaviour, and its own active and responsive characteristics and functions (Loughlin and Suina, 1982). The physical arrangement can affect the behaviour of learners in two ways: directly, by the behaviour that the setting allows; and indirectly, by the messages the setting conveys about what behaviours are permitted, how important learning is and what the roles of the learner and the teacher should be (Weinstein, 1992).

It has been stated that the classroom is the true heart of a school (Cooper, 1944). A classroom is not a single homogenous space. Rather, it is a network of interconnected and varied micro-environments (Sommer, 1977). The classroom as a system is much more than a place to house books, desks and materials (Martin, 2002).

Building Schools for the Future (BSF) was a massive programme (2004-2010) funded by the previous British Government who aimed to overhaul the country's education facilities by investing heavily in school building stock. The relationship between physical design and education has been relatively neglected. There is a need for congruence between architecture and education. BSF was particularly significant for areas of education such as art as this needs specialist spaces and equipment to provide the best experience for learners. There is a tendency for teachers of practical subjects to be more in control and aware of environmental factors. Woolf's 2007 booklet aimed to make more young people aware of art and using art as a means of creative self-expression. BSF realised the importance of the location of the art department within the whole school design. This is necessary for the art teaching rooms so they receive the best possible quality of daylight. Also, to enable a wide range of activities, for example 2D and 3D work require different spaces, equipment and layouts of furniture (Woolf, 2007). This scheme, which has sadly now been abolished, was created in response to OFSTED reports which stated as many as one in five schools had accommodation so unsatisfactory that the successful teaching of the curriculum was affected (OFSTED, 1993). The British government realised the importance of providing the best possible environments in which to teach and learn successfully. However, lack of funds and the recession in Britain meant that the BSF initiative was scrapped on the 5th July 2010 meaning that over 700 school reinvestment programmes did not happen (Partnerships for schools, 2011). Achieving the right school environment is crucial but sometimes lack of finance may hinder these idealistic plans.

Through attending Making Space 2010 (International Conference) located in Edinburgh I became aware of the key issues identified by architects, planners, educators and psychologists in improving learning environments for the future. The international award credits the most successful building or space (indoor or outdoor) that is a conducive learning environment for children and young people 0-18 inclusive. Factors consider how these young people relate to their environment and the impact this has on their development. For example, does the environment encourage and engage their five senses? Also, some structures have tried to

incorporate the natural world and relating and responding to the local environment. For example, in a West African country they have developed a revolutionary 'transportable classroom'. This is an innovative approach which has transformed learning as it means that schooling can take place anywhere and the school can travel to needy pupils (International Architecture Award, 2010).

'Imagine', a school design website, provides a critical analysis of over 150 worldwide schools focusing on excellence in design in relation to different themes. For example, the area of environmental design and flexibility to enhance space and learning is considered. This website provides a rich summary of contemporary school design which is not restricted to a single country. There are innovative and imaginative approaches being pioneered in classrooms around the world from Colombia to Australia and Bangladesh to the U.S.A. All the schools recognise the importance of an appropriate design for schooling environments to facilitate learning (Imagine, 2010).

Projects such as BSF and 'Making a Space' have stated that any architectural planning should involve as many members of the learning community as possible. This will enable all users to share their experiences of classroom design elements and what works best for them. Additionally, the best environments need not be the most expensive. 'Learning from Landscapes' was established in 1985 to try to explore the possibilities of using outside classroom spaces in primary school education. An outside space can facilitate activities such as painting, music, drama and dance. There is a great potential for outside space to be used as an aid to teaching activities in schools (Hodgson and Leicester, 2002).

School environments should consider the importance of collective space and utilising every single feature of the environment. 'Space for Art' recommends the following questions when considering location such as: activities on offer; opportunities for display; the quality and level of light available; views outside the space; access to an outside space for work; the number and age range of potential users; ready access to basic services; the level of external noise and opportunities for flexibility, adaptability and expansion. In addition, in art classrooms it is crucial that each user shares a sense of ownership and belonging in that environment. This sense of ownership is seen as an important element in facilitating creativity and enabling pupils to take risks and feel free (Space for Art, 2003).

This makes clear the importance of effective design considerations and commitment to the management of educational environments, in order to enable the improvement of learning experiences. However, while the preferred situation is opportunities for new buildings, the majority of schools need to consider informed guidance on modification of what exists.

2.6 Developing Creativity in Education

Seeking to develop an outstanding educational system Singapore created the 'Thinking Schools' framework which highlighted the importance of teacher's roles in facilitating creative thinking, and a national UK organisation called Creativity, Culture and Education (CCE) is aiming to transform the lives of children by harnessing the potential of creative learning to enhance their aspirations and skills. They believe that fostering creativity is important as creativity brings with it the ability to innovate, problem solve, ask questions, make connections and to think critically. These skills are fundamental for contemporary employers (Fleming, 2010).

There are also a wide range of independent schools throughout the world which view creativity as one of the most important skills a child can develop and therefore tailor their curriculum to facilitate creativity. Maria Montessori schools were pioneers in developing and nurturing individual creativity. One of the main principles of these schools is that: each child is unique and has creative potential. Students have an innate desire to learn, create discover and also the inherent right to be treated with respect. Within a Montessori school, there is a learning triangle composed of the teacher, student and the environment. The teacher prepares and organises the environment; the student chooses what they want to learn from the environment whilst interacting with the teacher.

Another type of school which pays close attention to the importance of developing and maintaining creativity is the Waldorf-Steiner school. The Waldorf-Steiner school system, and its tailored curriculum, is extremely popular and there are now numerous Waldorf- Steiner schools scattered across the globe. This is a curriculum that, although first established in 1919, is increasingly valued for its innovative approach with current research frequently validating what has long been the practice in Steiner schools throughout the world. The Steiner Waldorf curriculum is essentially holistic and spans the age range from $3^{1/2}$-18 years. It places strong emphasis on integrating art, crafts, drama and music, with science also taught using a creative approach (SWSF, 2009). All lessons in this unique curriculum have a

mixture of artistic, practical and intellectual content. This system views artistic activity, creativity and the development of the imagination as integral to learning.

During my research The Edinburgh Rudolf Steiner School was visited. This school offers the internationally recognized Steiner Waldorf curriculum. My intention was to observe the art classroom environment and note the differences between this school and regular schools. What type of classroom environment would best stimulate creative and critical thinking?

This school has its critics though and a controversial aspect of this school's philosophy is that too much early learning can affect spiritual development of children. Therefore, reading and writing is not introduced until the child is 8 years old

In Italy the Reggio Emilia approach was developed from their own cultural view of children as being the collective responsibility of the state. This programme is focused on infant/toddler and pre-primary and is generously supported financially by the government. The Reggio Emilia method has theoretical links with Piaget, Bruner and Vygotsky. This is a constructivist approach to education. The physical environment and its organisation play an important part in this early-childhood programme. The environment is actually referred to as the child's 'third teacher'.

These pre-schools are full of indoor plants. There is an abundance of natural light. The entryways are captivating with the use of mirrors on every available space such as walls, floors and ceilings. The physical environment clearly engages, informs and stimulates both adult and child. A high value is placed on displays and children's work and photographs are shown alongside transcriptions of their discussions. In each classroom displays of current project work are generously placed around the room. Each classroom has a studio space and designated areas for large and small group activities. The environment is organised to encourage community and to create opportunities for the children to interact and engage with each other.

The curriculum is focused on real-life problem solving and there is plenty of time for creative thinking and exploration. Reggio teachers value their ability to improvise and respond to the children's needs as this provokes creative thinking and critical thinking (Reggio Emilia, 2011).

Beghetto's (2007) research into creative thinking recognised that creative thinking is an essential skill to possess for the 21st century. Classroom discussions are a suitable arena for students to hone and develop their creative thinking skills and techniques. A way in which teachers can support the creative thinking of their students is to acknowledge, encourage and reward students' unique ideas and creative thinking (Sternberg & Grigorenko, 2004). In observations of classroom discussions, teachers would often dismiss or punish unexpected student ideas and suggestions (Kennedy, 2005, Beghetto, 2007). An important aspect of creativity enhancement involves giving students constructive feedback so they can develop their own ability to self-regulate their creative expression during classroom discussion (Beghetto, 2007). Beghetto suggests that teacher training must deal with this situation and stress to prospective teachers the importance of encouraging creativity (Beghetto, 2007). Teaching itself requires so much creative thinking, risk-taking and problem solving, though often teachers are not told to think for themselves but are handed a curriculum, and a fixed environment unamenable to change and new policies and guidelines which restrains creative thinking.

If teachers focus too much on avoiding mistakes and relevance, it may inhibit students to share their ideas with others. Students should be able to use classroom discussions as appropriate opportunities to take intellectual risks necessary for creative thinking (Beghetto, 2007). Other researchers suggest that teachers must try to establish a safe classroom environment in which students can take risks (Tighe *et al*., 2003).

Does creativity need a unique environment to be fostered? The handbook 'Space for Art' resulted from a two-year research project to answer that question, was run in partnership with Arts Council England, DfES, the Qualifications and Curriculum Authority (QCA) amongst others. The project's aim was to make sure that art education spaces and creative learning environments realise their full potential for users. The key was providing flexibility which should enable creativity and exploration. The spaces should enable a vast range of opportunities such as watching films or engaging in large-scale 3-D work.

The findings of a series of focus groups with art teachers, architects, artists, pupils and art gallery staff culminated in an informative and inspiring handbook. Alongside the focus groups a questionnaire was sent to 2000 art teachers and also 845 galleries and museums. There were also individual case studies of art education spaces. The handbook discusses the

complex variables that reside in a learning environment and the need for guidance as to how to provide effective spaces which will empower teachers and develop creative capacity.

More schools now realise the importance of providing more facilities and opportunities for the wider local community and they acknowledge wider learning environments: 'The visual arts have a unique role to play in the lives of children and young people' (Space for Art, 2003, p.10). This project was developed as a response to the fact that pupils are denied opportunities to realise their true creative capacity due to a number of factors such as lack of resources, lack of expertise, time and space given to art in schools.

The research highlighted the fact that 'Art and design requires dedicated physical space in school that is [designed specifically for the subject's requirements], well resourced, and well maintained' (Space for Art, 2003, p.11). If the learning environment is limited and cramped this may impinge upon and inhibit the creativity and exploration of those who work within the space. Classroom design elements need to be aesthetically suitable to facilitate learning and encourage collective relationships enabling social harmony.

In review of the literature that has described and discussed a range of educational approaches and environments, there would seem to be worth and potential for impact, if the investigation and its interventions involved a selection of common elements. In addition, if the forms of manipulation used in the interventions, as the contribution to new knowledge, was relatively easy to manage, then this would suggest that its ease of replication would enable greater uptake and benefit,

2.7 Art Education in Saudi Arabia.

It is important to understand something of the Saudi Arabian culture and its education system in order to appreciate more recent changes in its approaches to teaching, and its openness to new ideas for improving educational experiences, but also to acknowledge certain constraints that persist, and make education here different from the West.

In the past, in Saudi Arabia, education was restricted to a limited number of male individuals, and instruction took place at religious schools in mosques in urban areas. These schools taught Islamic law and basic literacy skills. Today, the education system has become comprehensive; it welcomes everyone to gain an education from pre-school through to

university. Issues specific to adolescent girls living in Saudi Arabia are described in this section to provide insight into what became the focus of this programme of research.

The Kingdom of Saudi Arabia is located in the southwestern part of Asia and constitutes more than three-fourths of the Arabian Peninsula. It is bordered on the west by the Red Sea; on the north by Jordan, Iraq, and Kuwait; on the east by the Arabian Gulf, Qatar, the United Arab Emirates, Bahrain and Oman; and on the south by Yemen and Oman. The country covers an area of approximately 2,240,000 square kilometres. The population of approximately twenty eight million people are all followers of the Islamic faith. The first language is Arabic. The majority of the people live in cities, towns, and villages that are located around commercial, industrial, or agricultural centres. The capital is Riyadh; but the largest city is Jeddah; the most important city in the major oil producing area Dammam, as a major city in the oil industry region with much socio-economic influence; and the top two holy cities are Mecca and Medina which have social and cultural influences to varying degrees (Saudi Arabian Central Department of Statistics & Information, 2010).

The early education model in Saudi Arabia was founded on cultural teaching, this is teaching based on the Saudi Arabian culture and religion; however, the modern Saudi Arabian educational system provides quality instruction in the diverse fields of modern and traditional arts and sciences. This helps to meet the growing need for highly-educated people to build on its rapid social and economic progress (Nawwab *et al.*, 1995).

King Abdulaziz Ibn Saud established the first formally organised educational centre in 1926, a place called 'the Directorate of Education' (Alhamid *et al.* 2004, p.31). The objectives of Saudi Arabian educational policy have since become more focused to ensure that education becomes more efficient, to meet the economic and social requirements of the nation and to eliminate illiteracy among Saudi Arabian adults (MoE, 2006).

Education is free at all levels. While it is not compulsory, the government does encourage all Saudi's to attend school. Girls are separated from boys in the school buildings. In addition, the pupils, teachers and administrative staff are female in girls' schools and all male in boys' schools (Al-Hariri, 1987). General education for both boys and girls, managed by the MoE, the General Presidency of Girls' Education (GPGE) and other specialised agencies. General public education in Saudi Arabia consists of three stages: elementary, intermediate and

secondary. The pre-school stage is optional and available to children between the ages of three and six years.

The school year at all three levels consists of two semesters, which are usually fifteen weeks long. Classes per week vary from 28 to 35 according to the level. The length of each class is 45 minutes with a five-minute break between two consecutive classes. There are two main breaks during the school day: the first is 40 minutes long and follows the third lesson, while the second coincides with the midday prayers and lasts fifteen minutes (Alghamdi and Abduljawad, 2002).

Until 2003, responsibility for girls' education rested with the GPGE: 'Before 1960, nobody appeared to care for the education of females and there were no schools to educate females. In 1960, the need for girls' education was acknowledged by the government and public elementary schools for girls were established. Since then, continuous support from government for the education of girls has resulted in the opening of intermediate colleges for girls and has also extended to graduate level education' (Isa, 1982, p.42).

Improvements in educational standards have been achieved by raising the quality of teacher training programmes, improving the standards of evaluation for students and increasing the use of educational technology such as computers. The administration of the educational system has also been enhanced by delegating greater authority to the regional boards.

The research in Saudi Arabia focused on the theoretical aspects such as curriculum, teacher training, teaching method, and assessment (Al Sulaiman, 1994). Also, some research has focused on materials, costs, and future needs involved in educational environmental design (Al Megren, 2000). Al Megren, an assistant professor at King Saud University, Riyadh highlighted the need for short-term and long-term plans, involving planner, architects, engineers, and educators to work together to develop appropriate plans and standards for effective school buildings (Al Megren, 2000). Al Megren reported that the quality of present school buildings in Saudi Arabia is not effective for education with the dramatic increase in population. Some school buildings were clearly built too quickly to cope with the increased numbers, and this problem was exacerbated by lack of national experience and lack of cultural experience of those brought in to support development from outside Saudi Arabia (Al Megren, 1992).

Today's Saudi Arabian public educational system consists of more than 25 modern public and private universities, more than 33,000 schools, and a large number of colleges and other educational and training institutions in different regions of the country. Students receive free education, schoolbooks and health services. Over 25 per cent of the annual state budget is allocated to education, including professional training (MoE, 2006; MoE Stat. Report, 2009). None of the public schools will turn students away, and because it is now free teaching there are many students coming to school, this makes for very crowded classrooms (Al Megren, 1992). King Abdullah bin Abdulaziz, the current king of Saudi Arabia, has often stressed that the young people of Saudi Arabia are the country's most valuable resource. Education is seen by the state authorities as an essential aspect of family and community life (MoE, 2006).

Saudi Arabian schools aim to develop a social and academic atmosphere to give students a strong awareness of belonging to the school. In addition, a sense of pride and a feeling that they are wanted and nurtured by their place of education. The MoE encourages teachers, staff and parents to work together as teams to provide the best environment for students and give them high morale, confidence and self-worth (MoE, 2006).

The non-profit organisation 'King Abdulaziz and his companions Foundation for Giftedness and Creativity (Mawhiba)' was established in 1999 and is based in Riyadh, Saudi Arabia. The aim of this strategic plan is to encourage giftedness, stimulate creativity and support innovation. Mawhiba (1999) strives to find young creative talents and then support them by providing enriched educational activity. One of the goals of the organization is to support educational and professional institutions across Saudi Arabia in creating a competitive and challenging program for the gifted and talented students. It is believed that this will in turn support the sustained growth and prosperity of Saudi Arabia. While gifted children are supported in school by providing separate facilities to develop their creativity, such facilities really need to be available to students generally.

The Saudi Arabian national education policy states that the aim of education is the understanding of Islam and the inculcation and dissemination of the Islamic creed; the imbuing of the student with Islamic values, doctrines and ideals; and the imparting of various types of knowledge and skills. Saudi Arabian education also aims to further the social, economic and cultural development of society, and to prepare the individual to be a useful participant in the building of society (Al-Hariri, 1987). The Islamic faith requires people to be

kind, helping one another and exchanging ideas, but sometimes it is found that the class environments are cramped and do not support this.

This study focused on intermediate schools (12-15 years old), and this age range was chosen as it is an important developmental stage, lasting three years and bridging the elementary and secondary levels. Students must have finished elementary school before entering this stage. Upon completion of this stage, students can select one of three options:

- Regular secondary school.
- Vocational education.
- Qur'anic schools (Alghamdi and Abduljawad, 2002).

In addition to Islamic and Arabic courses, students at this level also take more general courses. These are listed in Table 2.1.

Table 2. 1: Curriculum for Intermediate Schools in Saudi Arabia

Subjects	Hours/Week		
	1st Grade (7)	2nd Grade (8)	3rd Grade (9)
Islamic studies	8	8	8
Arabic studies	6	6	6
Social studies	4	4	4
Mathematics	4	4	4
Science	4	4	4
English language	4	4	4
Art education	2	2	2
Physical education/ home economy	1	1	1
National education	1	1	1
Total hours	34	34	34

(Alhamid *et al.,* 2004).

Objectives of the Intermediate Stage:

1. Giving young people a comprehensive Islamic education.
2. Instilling the Islamic faith in the student in order to facilitate control of their attitude and behaviour.

3. Supplying students with the skills and knowledge suitable for their age and level so that they can grasp the basic principles of science and culture.
4. Developing students' intellectual ability.
5. Teaching students to participate in Islamic social life, community service and national development in a spirit of sincerity.
6. Preparing students for the next stage of education.

(Alhamid *et al.,* 2004)

These goals cater to the individual student in their teenage years, particularly in terms of instilling the Islamic faith within them, while simultaneously looking after their mental, social, psychological and social growth. Table 2.2 highlights the objectives from each level and how these gradually develop.

Table 2. 2: Educational stages of development of creative thinking and practice.

Stage	Creative Thinking and Practice
Kindergarten	Nurturing the child's creative instincts and looking after their physical, mental and moral growth in a natural environment that complies with Islamic requirements. Providing the child with an abundance of idioms, fundamentals and information that they can relate to and absorb within a year. Encouraging the child's imaginative thinking, developing literacy and giving them opportunities to blossom under guidance.
Elementary	Teaching students the value of innovation, as well as developing their ability to make handicrafts.
Intermediate	Giving young people a comprehensive Islamic education, which limits time committed to creative learning opportunities.
Secondary	Ensuring the graduation of a number of qualified and technically able students who are able to meet the country's needs and carry out religious and artistic works.

It should be noted that creativity at the Kindergarten stage is specifically promulgated as part of general childhood skills and the need for encouragement of imagination recognised. This creative aspect continues throughout student development in both elementary and intermediate levels although it must be emphasised that by the latter two stages the need for creativity is more implied rather than required.

The major turning point was when the Ministry of Education decided to make art education a school activity. According to Shawqi, 'art activities were not introduced into the Saudi school system until the year 1954, 28 years after the public schools opened' (2007, p. 37). This was the start of the formal involvement of art education in schools. At this time art education was simply known as 'drawing'. Alhila (2002) and Shawqi (2007) state that art education plays an important role in forming an individual's personality. Alhila and Shawqi affirm that art is an interesting subject and plays a significant role in a well-rounded education. Students who study art change their behaviour and manner, and become able to understand the meaning and value of things. They add that art education enriches the individual emotionally and spiritually and rounds out their practical and intellectual interests. It completes their personality by developing art appreciation and the correct standards of enjoyment with all the senses. It is clear that art education is an integral part of education. Children find in art an outlet for their feelings and reactions, adolescents find in art an expression for imaginary wishes and hopes, and adults find in art the best way of expressing ideas and forming their future personalities (Alhila, 2002; Shawqi, 2007). In our contemporary life, the development scale for any society is portrayed by the capabilities of its creators to satisfy the artistic needs of that society (Alnazawi, 1989). This is why art education should be practiced according to the latest psychological and educational research (Jody, 1997). According to Epaid (1995) an individual cannot develop a complete personality unless they are taught all the subjects. The educational system in developing countries aims to teach scientific and literary subjects and views them as being superior to art education and other artistic subjects. This tends to ignore the role of art education, which is amongst the most important of all subjects. Art does not follow objective standards, as is the case with science subjects, it provides value to society through its subjectivity, creating opportunities which objectivity may otherwise miss.

2.7.1 Value of Art Education

Art education is a tool that an individual uses to express ideas, feelings, emotions and reactions about the apparent and unseen things in the environment. It is the main outlet for one's imagination (Jody, 1997; Alhila, 2002). As with other educational subjects, art shapes an individual's life and helps them to procure a post in society and be successful in life. It enhances the artistic, mental and spiritual aspects of life and helps to integrate the personality. It is the essence of sentiment, which is spiritual food for the soul (Jody, 1997; Shawqi, 2007). Art education aims to explore the creative abilities and to provide an artistic atmosphere for the learning of fine arts and handicrafts. It allows students to relax, set aside their worries and practice their activities freely (Jody, 1997; Alhila, 2002). Art education in Saudi Arabia is just focused on art there are no music, dance or drama lessons. Islam encourages the study of Art but nevertheless imposes certain ground rules. Sarwar states that the aspects of art which involve human images and iconography are prohibited (Sarwar, 1994). The Iqra Trust focused on the fact that Muslim students are limited in the content of their drawing for example, animals and humans. However, there is a wide variety of artistic expression still available using calligraphic and geometric forms which will allow the full development of artistic skills (The Iqra Trust; 1991). Even though there are no actual punishments involved in producing these human images Muslim children and teachers will respect the rules. If a child draws a prohibited picture they will be told in a friendly way that this is not acceptable.

Art education is taught in schools at all levels. As both an artistic and mental activity, it develops the creative abilities of the student and helps them to organise their ideas and to produce beautiful, rare, interesting and useful things. It is not a luxury, as some might think, and is linked with acquiring artistic skills connected with visual appearances. Attention in schools now seems to be steered towards strict rules within the curriculum for the art education, while natural creative motivation, and the distinct, tangible understanding of art that a child possesses still needs to be developed. These limitations of the curriculum and/or environment that are placed on talented children divert their thoughts from the production of creative, inventive images to that of traditional images (Jody, 1997). Art education in the middle-east encompasses a variety of artistic activities, such as drawing, sculpture, tailoring, fashion design, advertising, ornamental and hand design and applied arts with its

various manifestations in the media of glass, wood, textiles and more (Alnazawi, 1989; Jody, 1997; Shawqi, 2007). These artistic practices are based around project briefs, which for example may involve the drawing of traditional architecture and crafts, where these drawings are then painted over, and finally used as a guide to modelling out or different materials.

Art education needs a deeper awareness of the secrets of teaching, which depends on feelings and emotions, and often its results exceed the prescriptive nature of the textbook. Teachers of art have diverse responsibilities in adjusting the behaviour, appreciating the aesthetic of art and growing the creative aspects, by giving a freedom of expression. The teacher has to be aware of these creative aspects and develop them and if they fail to do that, then they will gain a graduate generation with obliterated abilities who are unable to develop and be creative. There are essential differences between preparing an art teacher and an artist or designer. The art teacher emphasises behavioural creative thinking and being active for aesthetic appreciation while the artist/designer emphasises the basics of the profession and its secrets in a professional way (Alnazawi, 1989).

One of the intermediate girl's schools in Jeddah, Saudi Arabia had participated in a new project which increased Art Education from one to two lessons per week. This trial project began in 2007 and was intended to run for three years. The art teacher in this school was interviewed about the progress that had been achieved during this period. It was noted that the changes applied to the art curriculum, including the increase in the number of art lessons, did not include improvement of the art classroom environment.

The general aims of art education are:

- Showing pupils the artistic beauty of handicrafts and the environment, and helping them develop greater awareness of this beauty through the implementation of innovative ideas.
- Introducing different materials and methods used in the fine arts, and teaching students how to use them.
- Developing students' ability to appreciate art and beauty, and allowing them to express their views.

- Refining students' emotions and feelings through the practice of art as an implementation of the authentic approach, and helping them adapt to the surrounding environment.

- Training their senses for limitless usage and moving them towards creation and innovation.

- Teaching them to reap the benefits of work.

- Making students aware of the value of observation, distinction and perfection.

- Imparting to students knowledge of various cultures by teaching them the international work of fine art. [There are limitations regarding the content of the work and what is acceptable to culture. For example, natural drawing].

- Identifying talented students and developing their skills.

- Teaching students to beautify the environment and society.

- Giving students the opportunity to work with various materials, especially materials making use of the natural environment so that students can connect them with their home and country.

- Helping students to make use of their free time by producing various artistic works.   (MoE, 2006)

Experience of the arts can also increase children's spiritual awareness, because of the nature of the art exercises and assignments. The arts can provide opportunities for engagement with the senses and emotions, which can remind the child of a feeling or feelings that transcend the routine of everyday life. Art education is fundamental in enabling children to develop aesthetic and affective responses to their inner and outer worlds. In the same way that the inner and outer world of a story takes young children on a journey art also helps them to understand and relate with their own environment and the entire world (Broadbent, 2004).

The theory of drawing development in children, described below, helps to explain the progression a child will follow in their typical art education. The concepts of trying new things through, creative thinking and practice are integral to moving through the art education stages:

- *Scribbling stage*: starts from 2-4 years old. Where the child starts drawing random and different types of lines.

- *Pre-schematic stage*: starts from 4-7 years old and the child at this stage mentally, physically and socially has grown up from the previous stage. The child continually searches for new concepts so symbols constantly change.

- *The schematic stage*: from 7-9 years old. At this stage the child's character is being formed. He/she is mentally and socially mature. This will reflect through his/her art expression, where we can see the drawing at this stage is more spontaneous and free. It represents the child's active knowledge of the subject.

- *The drawing realism stage*: from 9-11 years old. This is a transitional period for a child from self direction which depends on knowledgeable facts into objective direction that depends on visual facts, whereas the symbols become more realistic.

- *The realistic expression stage*: from 11-13 years old. The child goes through comprehensive changes in all of his/her life aspects, mentally, physically, emotionally and socially. These changes have a great influence in his/her artistic expression (Alnazawi, 1989; Shawqi, 2007).

In summary, while there are cultural differences between Saudi Arabia and the West there is a clear sense of value in the art subjects, and developing both the teachers and their teaching environment in support of developing the student experience. This has been facilitated by the work of a number of researchers into the quality of the learning environment, and this has highlighted the need for more research in this area, including an openness to design experience from outside of Saudi Arabia.

2.8 Adolescence

While it can be acknowledged that each developmental stage for a child can be critical for experience for different reasons, the adolescent phase of intermediate schooling is particularly relevant to art education in Saudi Arabia. This is because this period in their education is when attending art lessons is not an option, and therefore every effort should be taken to provide an effective learning environment. The research samples were taken from girls' intermediate schools (12-15) in Jeddah, Saudi Arabia. I investigated adolescence to gain more insight and to understand the characteristics of this age group. Adolescents in Saudi Arabia are similar to

adolescents around the world. Many experiences of adolescent girls can be considered universal. This period is a time of great transition; it is unique and significant in human development. It is a transition from an individual's childhood years to the beginning of young adulthood. The children at this stage (puberty) are changing physically, biologically, emotionally, socially and intellectually.

In adolescence, 'individuals more intensely pursue independence and seek their own identity. Their thought becomes more abstract, logical, and idealistic' (Santrock, 2004, p.36). In early adolescence, emotional and social development involves relating in new ways to both peers and adults. Adolescents begin to experiment with new behaviours as they move from childhood to adulthood. They develop emotionally, establishing a new sense of who they are and who they want to become. Emotional characteristics developed by early adolescents include:

a) Moodiness is the most obvious outward expression of unstable emotional activity. Adolescent's moods tend to change more regularly over the course of a day compared to an adult's moods which tend to be more constant (Wolfe and Mash, 2006). Various traditional classroom management strategies, including the use of punishment, may worsen an already complicated instructional situation. Rather than teaching a student certain skills, the use of punishment can have a bad affect on adult-student relationships, causing students to shy away from future interactions and, in turn, reduce the number of opportunities for teachers to demonstrate and highlight appropriate behaviours. Furthermore, the use of punishment as a disciplinary tool can trigger in students feelings of anger, defiance, or a desire for revenge (Hester *et al.*, 2003). In art education in Saudi Arabia teachers can punish students by telling them off and/or reducing their mark, e.g. if they disturb the class. Intermediate teachers have a number of tasks which involve establishing a suitable learning environment that provides the physical and psychological components necessary for student growth and development.

b) Anger is often expressed in sudden, furious outbursts. Appropriate reactions are often determined by observing what adults do in similar circumstances, as

well as how characters on media and television react in similar situations (Caissy, 1994).

c) Fears, worries, and anxiety: adolescents have numerous worries and fears about issues such as physical appearance and social standing. During adolescence physical appearance commonly assumes paramount importance. Girls and boys both spend hours concerned about their appearance, particularly in order to fit in socially (Woolfolk *et al.*, 2008).

d) Adolescence involves transformation of the mind and body which will lead the adolescent to experience feelings of instability. This instability may apply to their emotional state and to their goals and interests, which may always be changing. For example, they may begin an activity with enthusiasm and anticipation only to then abandon it (Wolfe and Mash, 2006).

e) Extremes: they use a vocabulary with extreme meanings when they describe things or events, particularly those that are important to them. Examples include words such as 'hate', 'excellent' or 'horrible'(Caissy, 1994).

f) Self-esteem is important, and the children who have positive self-esteem are more confident, successful, and less subject to peer pressure. They are more proficient in their ability to solve their problems and manage with their stress, and be happy with themselves. They have a strong sense of belonging within their families, peer groups, and their society. Friendship becomes increasingly significant for children between ten to fourteen years of age. Friendships and peer interaction is more important than anything else in their lives. In this period they need social interaction (Caissy, 1994). This links into creative thinking and practices of adolescent girls. Creative thinking can be enhanced by social interaction.

Intellectual development, throughout adolescence, involves changes in the brain that increase learners' computational skills as well as their ability to control behaviour in any level of stress or condition. However, until the early 20s, these abilities are not fully realised because brains are not fully developed (Woolfolk *et al.*, 2008). Adolescence involves major cognitive development as the adolescent's developing brains enable new cognitive skills to emerge such as hypothetical and abstract thinking. Young children are concrete thinkers who can organise information about concepts and categories. As a child progresses through early adolescence, they begin

to make the transition from concrete thinking to abstract thinking at different times and rates (Wolfe and Mash, 2006).

Adolescents cannot concentrate for long periods of time and need to break up learning situations into smaller chunks of time. They prefer to be involved in the mental activities rather than participate as observers and sit and listen to a lecture, because they are curious individuals. They enjoy learning that is related to their current interests and goals. They will work hard to achieve goals that they see as worthwhile (Caissy, 1994). Some teachers in Saudi Arabia try to adapt the curriculum from the MoE by adopting some elements that will be more relevant and interesting for this age group. For example, when palms are not available, for weaving projects for instance, such projects would need modifying, so paper might be used instead. Not all teachers have the experience and commitment to do this.

A number of middle school research articles highlight the benefits of a positive school environment on young adolescents' academic achievement and positive socialisation (Carnegie Council on Adolescent Development, 1989; National Middle School Association Columbuse, 1995; Hester *et al.*, 2003). Middle school educators should consider young adolescents' developmental characteristics in order to create the most appropriate learning environment. This environment should be one that contributes to positive behaviour and supports young adolescents' social, emotional, and academic achievement and the most effective classroom management practices (Hester *et al.*, 2003).

There is evidence that indicates the behaviour of young adolescents is affected by changes in experiences designed to support positive feelings toward themselves and others, as well as toward living in a diverse society, peer approval, and general social interaction (Manning, 1999/2000). In Saudi Arabia the school environment is an important place for social interaction and exchange of experiences between students. This is due to the fact that in this country not all families allow girls to go out and visit friends outside of school hours. School is the only way that the girls can meet and socialise together therefore it is important that teachers create a friendly environment to allow students to share ideas and ways of thinking.

In the learning environment, adults and children are different in their visual and spatial experiences. They are distinct in their size, role, and movement patterns. Children and adults have totally different views in the same room as they occupy different space, see different surroundings, and have a different impression of the environment they live in. In order to predict the behaviours that are likely to occur as children operate in the learning environment, the teacher must remove him or herself from the adult environment. A way must be found to enter the child's environment, to perceive the space, the materials, and the information in it. This can only be done by placing him or herself in the areas where children will work and move, and by analysing the environment from the child's point of view (Loughlin, 1977).

With regard to the physical growth of adolescence, it is therefore necessary to consider the furniture in the middle-level classroom. A variety of different sized desks and chairs are required to accommodate students of all sizes highlighted the importance of choosing classroom furniture that suits students of all body sizes (Caissy, 1994; Loughlin and Suina, 1982).

Increased experimentation and exploration are other characteristics of the early adolescent intellect. They have vivid imaginations; therefore, they can be very creative, generating innovative projects and work as a result. However, adolescents require encouragement in this area because there are many elements that can hold them back, such as their tendency for heightened self-consciousness and a lack of self-confidence (Caissy, 1994). Teachers can enhance students' creative thinking by appropriate feedback, which can also improve the relationship between teacher and student, and encourage a student to improve their work (Burnett, 2002). However, the capacity for appropriate feedback may be influenced by the layout of a room and the ease of access to students to view and discuss examples of good work.

This section has described the characteristics and needs of adolescent development, and determined that there are particular issues these children face which require greater understanding by teachers to support their learning needs. For example, the learning environment needs to support social learning whilst also providing space for individuality.

2.9 Classroom Design Elements

The classroom environment can be a powerful teaching tool; it can influence the behaviour of teachers and their students. The awareness of the relationship between physical surroundings and behaviour is important for planning, organising, and adjusting a learning environment. Environmental concepts enable teachers to predict behaviour in certain settings (Loughlin, 1977). Even relatively minor design modifications introduced into already functioning classrooms have been shown to produce changes in students' behaviour (Weinstein, 1979).

Spaces can be adjusted in order to encourage useful language interaction between children, to shelter an individual working child, to foster and extend group inquiry, or to encourage cooperative interaction. The classroom environment can support and extend the teachers' purposes and behaviour expectations (Loughlin, 1977; Muijs and Reynolds, 2005).

The teacher can shape the classroom environment by considering crucial questions, such as the number of students in the classroom, their position, task, movement and equipment. Cassidy (1997, p.9) described the environmental influence on social interaction by seating arrangement, where sociopetal layouts, seating in a circle, enhanced interaction, while sociofugal layouts, seating in lines, restricted interaction.

Observation of children's actions inform the arranging of effective leaning environments (Loughlin, 1977). Some teachers develop the intellectual atmosphere of their classroom by arranging a special thinking area, which may for example display questions related to the national issues or local environment issues (Fisher, 1990; Muijs and Reynolds, 2005). The benefit of a carefully planned physical environment is that it may enhance student opportunities and support them to be able to manage their own behaviour (McLeod *et al.,* 2003).

Some design elements such as space, texture, colour and furnishings influence people to act in certain ways. Knowledgeable use of these elements can lead to the creation of environments that cause emotional responses such as feeling cool, happy, warm or relaxed (Nielson and Taylor, 2002). In order to cultivate a positive learning environment, it should be softened by adding such furnishings as cushioned chairs,

cabinets for books, adjustable lighting, colourful carpets, live plants, pictures or a bulletin board. These can make the room less sterile, more soft and appealing to students, improve the learning experience, raising the level of student satisfaction and interaction in the classroom (Sommer and Olsen, 1980).

The nature of the educational environment is extremely complex, with many interrelated variables that have an influence on experiences and outcomes. There is a hierarchy of modifiability involved with regards to the control that teachers have over the physical elements of the classroom setting. Architectural elements have been classified in terms of hard (fixed features) and soft architecture elements which are fairly flexible to move and adapt (Martin, 2002). Art space is different from a general classroom environment and the research project 'Space for Art' indicates the spatial requirements of an art space as suggested by the department for education and skills: 'The DfES suggests that, for a group of 30 children of secondary school age, an art space should range from 79 to 103m squared for mainly 2D activities, 103 to 115m squared for textiles-based activities, and 103 to 120m squared for mainly 3D work, depending on the number and age of the pupils' (Space for Art, 2003,p.18). When considering personal space there are different types such as private, social or public. Different cultures have different implicit guidelines for example in USA personal space is viewed as between one and a half feet to four feet. People will feel uncomfortable if someone breaches this space. Whilst in Japan private and public space is crowded due to the large population and generations of families that share homes. In Arab countries personal space is closer and more intimate due to the culture (Lindh *et al.,* 2009).

In the next section I considered a number of factors in the physical environment that could potentially facilitate creative thinking and practices of adolescent girls in Saudi Arabia. The factors considered are: ventilation and temperature, noise, lighting, colour, nature and space management. Some of these factors the teacher has control over and others are factors they have to contend or cope with. This distinction informs my study and the variables that I can manipulate. It is important to have an overview of the different factors within the learning environment as some of these impinge on mood, productivity, absenteeism and creativity. Some of these factors haven't been researched in relation to creativity but there is still an expected link to

creative thinking and practices. These factors have also been chosen due to their importance in Saudi Arabian culture and there is a need for this investigation.

2.9.1 Ventilation and Temperature

According to McMullan (2002,p.94), 'ventilation is the process of changing the air in a room or in some other internal space. This process should be continuous with new air taken from a clean source'. The typical ventilation rate in classrooms is three to four air changes per hour. Other experts consider indoor air pollution as one of the major threats to health (Wolverton, 1996).

Saudi Arabian classrooms use a simple door and window design with air conditioning units controlling the ventilation. An innovative architectural project in Hanoi uses the 'space block' design. Space block design involves strips in each roof which allow light, shade and ventilation to flow through the building. This is an architectural method that eliminates the need for conventional air-conditioning by using 'louvered openings' and 'three-dimensional patios' (Fernandez Per *et al.*, 2007,p.341).

There is growing evidence that a school's physical condition, especially the lighting and indoor air quality, may have a direct influence on students' task performance (Wilson, 2002). Students spend most of their school time inside classrooms. The quality of air inside their school may be more polluted than the air outside. Poor indoor air quality can increase the chances of both long-term and short-term health problems for students and staff by reducing teacher productivity, degrading the student learning environment and comfort level, and affecting student performance on mental tasks involving concentration (Haverinen-Shaughnessy *et al*, 2011; Clements-Croome *et al.,* 2008; EPA, 2003; Lee and Chang, 2000; Caissy, 1994). Poor indoor air quality may also increase allergies and cause respiratory diseases such as asthma and infections (EPA, 2003; Kennedy, 2001; Fisk, 2000). In Saudi Arabia students spend ninety minutes inside their art classroom during each session; therefore, ventilation is required in art classrooms because students are using different materials to complete their art projects. Hagaman (1986) warned that the manipulation and inhalation of powders, dusts and vapours from solvents of some materials used in art could cause health problems and allergic reactions. These

factors could result in a higher possibility of occurrence of short-term and/or long-term health problems for students and teachers. From my experience a potential reduction of teacher effort and ability due to health problems caused by poor ventilation may be reflected in student outcomes.

A study by Norback and Nordstrom investigated the effects of ventilation on student perception in a Swedish university. They found that the women in the study were more sensitive to the changes in indoor air quality compared to the men. In this study the female students were less satisfied with the indoor air quality and this affected their overall perceptions of the learning environment (Norback and Nordstrom, 2008). Fisher (2005) identifies the importance of air circulation, as he points out that the brain needs plentiful supplies of oxygen to function well. We understand from this point the importance of good ventilation in classrooms which could contribute to more effective creative thinking.

2.9.2 Noise

Noise is a psychological concept defined as unwanted sound. Excessive noise can cause various health problems, such as hearing loss and high blood pressure. It can negatively affect psychosocial relationships and working performance (Lebo and Oliphant, 1968). It is one of the many issues that affect the classroom climate and the children's mood (Lundquist *et al.,* 2002). Stansfeld and Matheson (2003,p.253) concluded that 'the evidence for effects of environmental noise on health is strongest for annoyance, sleep and cognitive performance in adults and children'. Good acoustics are fundamental for learning. Open plan areas can be successful but it depends on the type of activities that are being carried out (Hodgson and Leicester, 2002).

Too much silence (i.e. low noise level) also fails to create an optimal working environment. Background sound effects (such as music) with a level of about 35 decibels can maximise alertness, allow relaxation, improve classroom atmosphere, aid learning, and improve academic performance (Knirk, 1992). Background music can be useful in creating a positive learning environment that assists students' task persistence and productivity (Savage and Savage, 2009). Different types of music affect brain wave patterns, resulting in a speeding up or slowing down of brain

activity. Some teachers find that playing music such as *Handel's Water Music Suite* calms the students, while other type of music such as *marches* have an opposite, energising effect (Wolfe, 2001). The problem with music is that not everybody enjoys the same type. Students have differing musical preferences, therefore it is important for the teacher to use the appropriate type of music (Savage and Savage, 2009). However, Hilton *et al.*, (2004) found that, at best, music enabled only minor positive benefit on creative and critical thinking tasks, and only when individuals listened to their preferred music played at a low volume. It should be noted, for cultural reasons however, it is not acceptable to play music in the schools, while natural sounds e.g. bird song recordings is acceptable and may be appropriate.

There are many factors in schools that cause noise: playgrounds; corridors; ventilation systems; scraping of chairs; doors slamming; children themselves; and passing traffic (Day, 1999). The main source of background noise in classrooms [in Saudi Arabia] is usually the air conditioning and ventilation systems. A centralised system is usually much quieter than window or room units, which are very loud and difficult to treat with sound absorbing materials (Schools of the 21st Century, 2007).

2.9.3 Lighting

Lighting has always been a significant factor in designing and operating schools (James, 2001). Lighting is one of the most important physical characteristics of the classroom and it has a direct effect on teaching and learning (Schneider, 2003). Lighting has a powerful effect on the atmosphere of a space (Hodgson and Leicester, 2002). Light can make a space appear large or small, friendly or cold; it can also change the apparent identity of colour (Nielson and Taylor, 2002). From my experience daylight and artificial light can also have different effects on students' artwork. The same colour can look slightly different when exposed to daylight compared to how it looks under artificial light. Therefore, the art teacher needs to assess students' art work under the same consistent conditions.

The most commonly used forms of classroom lighting are daylight fluorescent and cool white light (Rosenfeld, 1977). An appropriate level of lighting enhances productivity, quality, morale, and energy conservation. Bright light can reduce seasonal depression; however, overly intense sunlight can create a painful glare for

both teachers and students, especially during the summer (Lewy *et al.*, 1982). Some white light is irritating and causes headaches, eyestrain and fatigue because it contains ultraviolet rays (Karpen, 1993). Daylight may improve performance by aiding improved long-term health (Heschong, 1999). When students in classrooms work without daylight, this may disturb their basic hormone pattern, and this in turn may influence the students' ability to concentrate or co-operate in their classroom (Kuller and Lindsten, 1992).

One of the projects mentioned by Mozas (2007) emphasised the importance of the direct relationship between inside and outside areas. This project in Barcelona won a competition in 2001 due to its innovative architectural design of a primary school and kindergarten, where one of the features is a playground on the roof, to maximise the educational areas and benefit from the effects of the sunlight which is constantly filtered into each of the classrooms (Fernandez Per *et al.,* 2007).

However good the natural lighting, an electric lighting system is needed for inclement days, the winter season and evening classes. Providing a lighting system that is energy efficient, has a long life, and requires minimal maintenance is one of the main objectives during classroom lighting design (James, 2001). According to O'Connor *et al.,* (1997, p.6), 'lighting and its associated cooling [...] constitute 30 to 40% of a commercial building's total energy use'. Therefore, windows can still be designed to give views and to control glare. Windows on two sides often deliver better daylight, maximising comfort, satisfaction and productivity (O'Connor *et al.*, 1997). If a student feels uncomfortable and dissatisfied with their environment they will be more focused on trying to relieve their discomfort than on their task, creative or otherwise.

2.9.4 Colour

Colours are perceived differently in different cultures, so that people do not have equivalent responses to the colour spectrum and the corresponding languages do not reference colours in exactly the same way. Furthermore, the symbolic reading of colour varies widely. For example, Americans view the colour red as suggesting anger, but red is viewed as a lucky colour for the Chinese. White is a traditional wedding gown colour in the USA but in India and Hong Kong it is a colour

associated with mourning. In Africa yellow is associated with disease (Onkvisit and Shaw, 2008). Colour has different meanings and aesthetic appeal in different places.

Colour is an important element of design, as it can elicit emotional responses. Colour has a significant effect on mood and atmosphere (Hodgson and Leicester, 2002). Humans have individual preferences and prejudices regarding colours (Nielson and Taylor, 2002; Engelbrecht, 2003). However, in general, people within various cultures respond similarly to colour combinations (Nielson and Taylor, 2002). The colours used in schools should be chosen not only for charm and beauty, but for its function (Birren, 1988). Rossbach and Yun (1994) state that colour is important and that when a school is designed, special attention should be given to classroom colour.

Previous studies have revealed that the colours in a classroom can affect how students behave and perform. Therefore, during the selection of safe, comfortable, flexible and durable furniture, schools should consider how the colours of the furnishings can enhance the learning environment (Kennedy, 2005).

The advantage of an effective choice of classroom wall colour is that it can relax the students' eyes, aid good visibility for the teacher, provide a good view of the materials displayed on the wall and give the classroom a different appearance from different directions. Ceilings should be white or off-white to reflect light and reduce shadows (Birren, 1988). Grangaard (1995) studied a small group of eleven six-year old elementary school students. He was investigating the effects of colour and light on the students' learning ability. This was a repeated measures experiment. The students were video recorded in two different classrooms and the number of off-task behaviours they performed was recorded. The first classroom was a standard classroom with white walls and cool-white fluorescent lights. The second classroom was modified and had full-spectrum lights and light blue walls. In addition to off-task behaviours being recorded the students also had their blood pressure measured in both rooms. Grangaard's results found that the students accumulated 390 off-task behaviours in the standard classroom environment. In the modified classroom off-task behaviour decreased to 310 which is a decrease of 22 percent. Other findings were that the students' mean blood pressure readings were also lower (9%) in the modified classroom compared to their readings in the standard classroom. Grangaard's study recognizes that changing the colour of a classroom can have a

significant effect on the attention of pupils and also their physical health and comfort.

2.9.5 Nature

Plants have many positive impacts on the overall classroom environment. Plants can clean the air of toxins and when well cared for, they also enhance the visual environment (Nielson and Taylor, 2002). A number of studies show that indoor and outdoor plants may enhance mental and physical well being (Wolverton, 1996). BBC News (2002) research suggests that students would perform better in their exams and coursework if potted plants were placed in classrooms. In addition, high levels of carbon dioxide (CO_2) in classrooms may negatively affect a child's capacity to learn, according to academics at Reading University. The benefit of plants in crowded classrooms is their ability to turn CO_2 into oxygen (O_2), by removal and use of the carbon, thereby improving the air quality. However, it is important to remember that plants are a treatment, not a solution. Sick Classroom Syndrome needs to be prevented rather than having its symptoms treated.

Wolverton (1996) provides information about 50 houseplants that have been tested for their ecological benefits. The text categorises them according to ease of growth and maintenance, resistance to pests, efficiency at removing chemical vapours and transpiration rates. The author pointed out some plants may be used in homes and offices such as 'Syngoniums' because of its ease of growth and maintenance. In addition, there are widely used plants like 'Ellen Danika' that may be used in public buildings.

Plants make the environment friendly, inviting, calming, and a spiritual place. In the business environment plants are used to enhance employee productivity and reduce absenteeism (Wolverton, 1996). Kaplan *et al.*, (1988) found that an outside window view to nature elements such as trees and flowers in the workplace was related to an increase in the satisfaction level of workers and reduced levels of job stresses in comparison to those who could see built elements or had no access to outside views. A teacher has no power to change the architecture of the school. However, they can deal with what already exists by the inclusion of plants to substitute the lack of view.

2.9.6 Space Management

This section is divided into three sections dealing with the overarching topic of space management. It will look at the layout of a classroom, the role of displays within the classroom and additional facilities. The various architectural features of the classroom can affect the learning environment both directly and indirectly. Mobile walls in classrooms facilitate innovation (Moos, 1979). Ground-breaking new research by Randall Fielding, the architect of Fielding Nair International (FNI), argues whether a classroom should even have four walls. FNI facilities have been built in 32 countries and Fielding has innovative ideas about using space effectively. In a modern school environment flexible spaces will mean the group size can vary enabling multiple learning modalities. Many walls in FNI buildings are mobile and often transparent. Fielding believes that the changing use of space management in school architecture tells the story of evolution in pedagogy. Space management can also impinge on organizational characteristics, teacher characteristics and student's behaviour and creative output (Design share, 2011).

Classroom management is a multipart task including the active designing of learning environments and activities to facilitate better teaching and learning experiences. There are four major components which may affect classroom management such as: managing the physical environment, management of learning, managing discipline, and managing classroom procedures. Traditionally, classroom management was viewed as a matter of exerting control over the learners but nowadays it has been perceived as the art of creating a good climate of learning environment and managing instruction effectively (Ming-Tak and Wai-Shing, 2008).

Savage and Savage (2009,p.66) defined classroom management as 'those actions to create an environment [which make] it possible for the teacher to teach and the student to learn. This means creating a supportive, inclusive, and nonthreatening environment. Well managed classrooms promote learning and prevent many disruptions. Poorly managed classrooms create uncertainty and conflict and reduce student opportunities to learn'.

Effective management is a major factor in contributing to a positive classroom environment. While extensive focus has been put on the development of teachers'

instructional roles, less importance has been placed on the knowledge and skills required for management and discipline. This is somewhat associated to teachers' perception of what 'classroom management' means. Their first course of action in defining the concept is their personal experience of schooling and individual growth, and especially the culture that nurtured them. The culture in which they grew up supplies the foundation for their social and moral values. These can be shared and communicated and thus, contribute to the cultivation of a common language related to management and discipline (Ming-Tak and Wai-Shing, 2008).

2.9.6.1 Classroom layout

The classroom layout and the use of furniture is a major issue of space management. Flexibility is really important when considering spatial arrangements. However, it must be considered that organisation is also significant. A classroom should be well organised to allow students to easily locate items at any time (Caissy, 1994). According to Sorrell and Sorrell (2005), filling any large space with badly selected furniture, will give the feeling of crowding. For example, furniture which is suitable for lab work not art, or wrongly positioned furniture, for instance in the full glare of the sunlight, or inappropriate sized furniture, that is not suitable for the age or height of the pupils. Proper selection of furniture can make any space feel attractive and comfortable. It is important to consider the need for furniture and the function of each piece. When the shapes, sizes, colours and textures are linked across the space, the chosen furniture becomes a seamless whole, rather than a disparate, jarring variety of styles.

Storage is important in any building, marking the difference between an ordered, calm and spacious room and one that seems crowded, messy and uncomfortable. Putting everything in its proper place reduces stress and maximises space for enjoyable and relaxed living (Sorrell and Sorrell, 2005). Storage is especially important for art classrooms to store the tools and dangerous materials in a safe place (Hagaman, 1986). Arrangements of materials can help students to extend and integrate their ongoing work, or develop new interests and projects. In addition, the teacher can choose to position the students into groups, as well as arranging the position of materials, in order to extend the students' attention spans and add to the depth of their studies (Loughlin, 1977).

The layout of tables communicates the intensity of interaction between teacher and students and among learners (Sommer, 1977). The seating arrangement is dependent on the furniture type, available space, classroom dimensions, number of students, type of task and teaching style (McLeod *et al.*, 2003; Savage and Savage, 2009). Different seating arrangements have different effects on communication in the classroom. Santrock (2004) describes a number of classroom arrangement styles as follows (see Figure 2.1).

Traditional auditorium style

- All students face the teacher (Sociofugal).
- Difficult for students to interact with each other.
- Easy movement for the teacher around the classroom.
- This arrangement is often used in lectures.

Face-to-face style

- Students face each other (Sociopetal).
- Level of distraction from other students higher than the auditorium style.

*Off-set styl*e

- Often three or four students at a table but do not sit directly across from one another.
- Effective for cooperative activity and less distraction than face-to-face.

Cluster style

- Small numbers of students, often four to eight, work as group.
- Especially useful for collaborative learning activities.
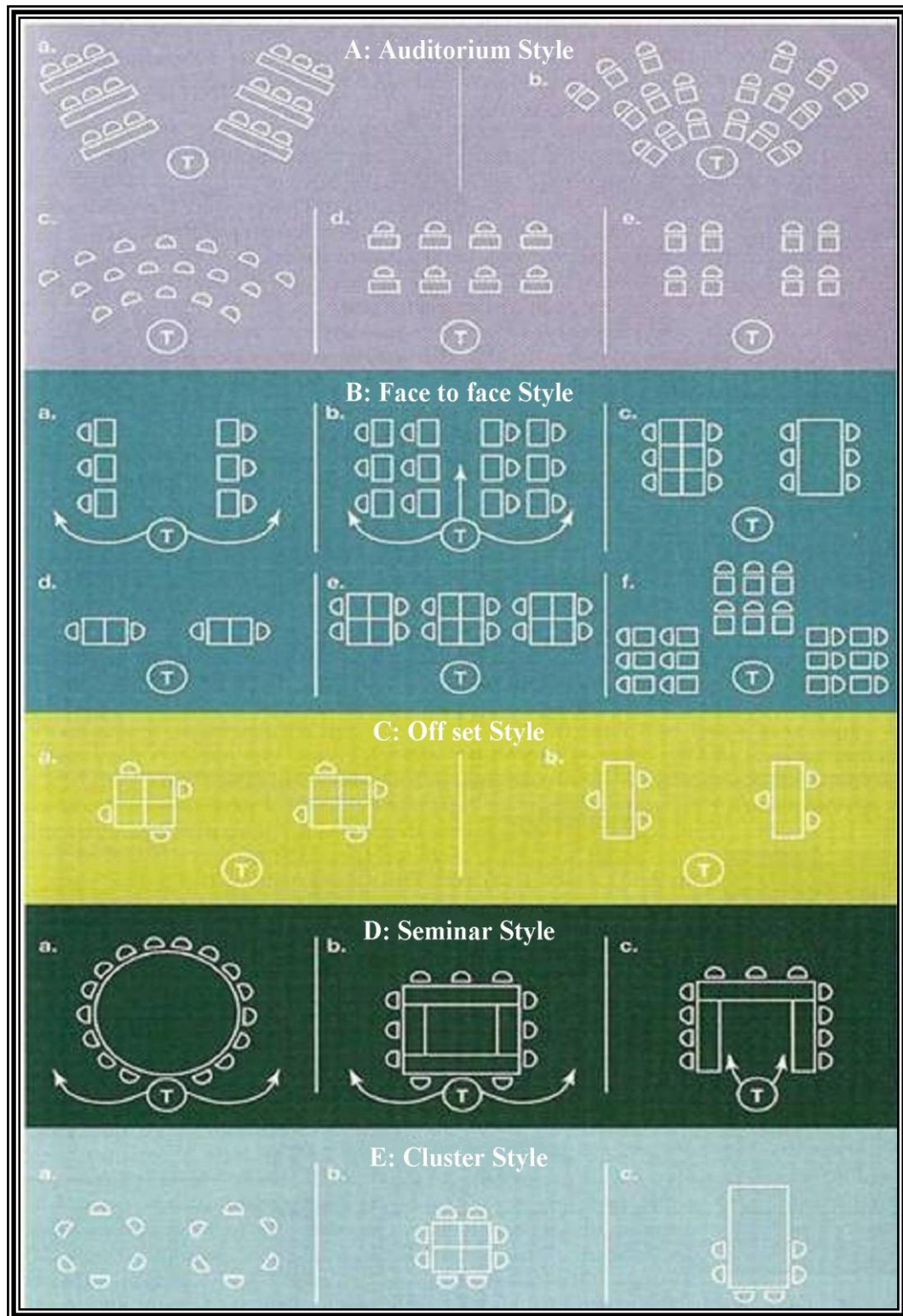
Figure 2. 1: Variation of Classroom Seating Arrangement (Santrock, 2004,p.55)

According to McCorskey and McVetta (1978), there are three common ways to arrange classroom seating:

- Traditional
- Horseshoe
- Modular

A study of secondary school classrooms in south-west Poland revealed that a horseshoe arrangement is best for classroom discussions, while modular arrangement is useful for group interaction (Sztejnberg and Finch, 2006). This suggests that grouped seating arrangements may increase student participation (McCorskey and McVetta, 1978). This approach could now be applied in Saudi Arabia to observe if it is appropriate for the art classroom environment.

Reid *et al.*, (1990) point out that small group work enables students to get the best use of the learning time in the classroom. Therefore, students can generate more ideas, exchanging experiences, helping each other, and recognising the value of their own work. It also produces a co-operative learning environment that supports students' efforts by developing self-confidence, and involving more students in discussions. This type of seating arrangement produces a beneficial teacher-student relationship by enabling the teacher to provide more assistance for students, listening carefully to small group discussion, and the teacher will have more time for personal contact. Previous studies revealed that co-operation in learning can efficiently facilitate students' development of their independent thinking, imagination and creativity (Esquivel, 1995; Fleith, 2000; Simplicio, 2000).

Sitting students sociopetally, in a circle encourages them to work in groups, and helps social interaction and communication, whereas sitting them sociofugally, in rows encourages students to work individually (Susi, 1989; Cassidy, 1997; Edwards, 2000; Muijs and Reynolds, 2005). Communication with others and encouragement of open discussion between individuals increases the number of creative ideas (Horng *et al*., 2005). While rows arrangement can limit student interaction but listening is enhanced. In addition, many teachers find the row arrangement makes it easier to monitor students and helps them to establish and maintain the control in classroom (Savage and Savage, 2009). The students who sit within the action zone usually have

a better attitude, possess higher achievement levels, and receive more feedback (Edwards, 2000; Savage and Savage, 2009). Savage and Savage (2009) define the action zone as usually consisting 'of those seats nearest the basic teaching position' if the teacher position is in the front, the action zone will be the front and down the centre like 'T' (Savage and Savage, 2009,p.72). The students in the front and centre of the row arrangement style are more likely to interact with the teacher, ask questions and start the discussion compared to students in other positions in the classroom (Santrock, 2004). Walberg (1969a) studied the relationship between seating position and personality. He demonstrated that high school students, who preferred to sit in the front of the classroom, liked school and placed a high positive value on learning, while students who preferred to sit near friends revealed a need for affiliation but apparently this is inconsistent with a desire for academic success. Those students in the back of the room or near the windows indicated that they were unhappy with school. They had negative attitudes toward learning and their own ability to achieve success.

Regardless of the type of arrangement, it is important to consider thoroughfares when planning the classroom arrangement because this allows the teacher to move easily around the classroom and check student progress during class (McLeod *et al.*, 2003; Muijs and Reynolds, 2005; Savage and Savage, 2009). It is important to establish the traffic patterns to ensure that movement in, out and around the classroom is efficient for the teacher and students, and that fire exits are clear in case of an emergency (McLeod *et al.*, 2003). It is important for art classrooms to consider safety because of the different types of tools and materials used during lessons. Araca (1986,p.14) states that flexibility and mobility in the classroom offers easy movement, changeability and 'commends the use of more compact objects'.

The position of the teacher's desk depends on the subject, students' ages and available space. There are different functions of the placement of the teacher's desk, in the front, back, centre, and side, such as to control or monitor students at work, or have private conversations with students. In elementary school, teachers position their desk depending on their personal philosophy of instruction and the seating arrangement. In general, the teachers place their desks in an out-of-the-way place to maximum space to allow for students to sit in a large circle on the floor. In middle

and high school classrooms teachers place their desk off to the side in the front of the classroom to allow easy access to the material that lies on the desk and monitor students (McLeod *et al.*, 2003).

It is clear that the way in which the classroom is structured can facilitate or hinder learning and thinking. Recent developments in learning space and furniture design acknowledge this. Holder references Oldborough Learning Plaza in her essay entitled 'Furniture for schools'. This Plaza utilises 'propeller' shaped tables which enable different sized group collaborations and discussions. The Plaza, a feature, from a new school in Kent shows how furniture design and spatial layout support recent and new pedagogies. The layout of desks enables different work spaces for individual quiet work and noisier discussion is allowed to flourish in central areas (Holder, 2011). Therefore the design element of classroom layout warrants further exploration in relation to its impact on creative thinking and practice.

2.9.6.2 Classroom display

Learning is a sensory experience. The major channels used to gather information from the environment are the eyes, ears, and fingers. The visual display in a classroom is a powerful learning tool (McLeod *et al.*, 2003). Humans eyes 'contain nearly 70 per cent of the body's sensory receptors and send millions of signals every second along the optic nerves to the visual processing centres of the brain' (Wolfe, 2001,p.152). Students remember visual information longer than they remember information present verbally (Wolfe, 2001). McLeod *et al*. (2003) state that some important elements of visual display are: a variety of ways used to present the information; updated information; and related to the subject curriculum. In addition, display of information related to the safe use of art materials and tools was of great importance for students to know the possible hazards in their art classroom (Hagaman, 1986).

The 'Space for Art' research project acknowledged that 'dedicated areas for display purposes are important in any art education space, since exhibiting work is a major reason for making art' (Space for Art, 2003,p.37) There are many ways to display pictures and prints; they do not necessarily need to be hung on a wall. Displaying groups of small pictures on shelves is also very effective (Wheeler, 2000). The

display of students' work can improve classroom atmosphere. It is important to display all student work, even if not the best, to encourage students to take pride in their work and this can motivate them (Muijs and Reynolds, 2005). A balance of stimulation and organisation in an art classroom environment is required for students to create their artwork. Ruscoe (2008) stated that a classroom with plenty of stimulus, artwork of artists as well as students and bright colours will broaden students' ideas. The environment that is efficiently presented with stimulating displays is most effective. A well presented workspace will support students to take pride in their personal work area. A crowded art classroom may negatively influence students' thinking and limit the development of their own ideas

Decoration plays a significant role in ensuring a comfortable classroom environment (Sommer and Olsen, 1980). Curtains can be one of the most eye-catching features in the room and can themselves be works of art by using traditional as well as unusual materials, such as flowing metal strips. A mirror with a decorative frame can transform a wall and act as a focal point in a room as well as create an impression of more space (Wheeler, 2000).

Ofsted acknowledge the importance of good quality wall displays in classrooms which can encourage pupils and also congratulate them on their achievements. This should lead to an increase in self-confidence and provide a stimulating learning environment (Ofsted, 1993). This indicates that displays may be a powerful facilitator of creative thinking and practice. The physical environment can convey what is expected and what is acceptable. This can influence an individual's own sense of self-esteem and confidence. The type of art displays and how they are used within the perimeter of the art classroom may be another design element worth investigating.

2.9.6.3 Additional classroom facilities

The goal of classroom design is to provide more intimate surroundings, to be suitable for a mixture of teaching methods and for smaller groups of students (Kirby, 1999). Schools have always made efforts to give students realistic experiences of technology through field trips, labs and various extracurricular activities. These activities have remained in the form of academic instruction and it has been difficult

to integrate these activities into schools due to numerous problems. Technology has helped to offer tools to solve these problems. It helps to create new opportunities for learning environments by bringing problems from the real world into classrooms for students to investigate and solve (Sahin and Turan, 2009). Many teachers encourage creativity by taking students on field trips to locations where creativity is valued (Santrock, 2004). Furthermore, technology not only helps students to create an active environment to solve problems, but also helps them to develop the necessary skills to live and solve their own problems (Heise and Grandgenett, 1996; Sahin and Turan, 2009).

The use of the internet is possibly more important to art subjects than some other subjects, because it enables students to find information about a variety of topics, using different search methods. Technology in the classroom allows the user to communicate with others and to access the most up-to-date information available. For art education, the internet provides a real opportunity to view or learn about art in different cultures. An art educator can find many resources, such as curriculum ideas that may reform the way art is taught by incorporating visual resources and contextual information from many different cultures. In addition, schools with fewer opportunities to offer field trips can use the internet to access information on museums and galleries. Students can create and send art images to other classrooms around the world. This allows a mutual sharing of ideas and inspiration, and the use of the internet can provide students with valuable artistic experience and can open new opportunities of creativity. The students can become more active as they explore new areas of learning. The internet can benefit the art teacher by assisting the teacher to find information about artists or periods in art history, allowing contact with other artists, and aiding awareness of new tools for the art classroom (Heise and Grandgenett, 1996).

Some art teachers don't feel comfortable using electronic media because they fear the danger of prioritising form over content, and a loss of the spirituality connected with art. The problem also lies in traditional attitudes, which come across with the view that computers are for sharing information, favourable only to academic subjects like science and math, but not for the study of aesthetics. Art teachers rely on images in order for them to communicate effectively about the subject of imagery.

Many teachers use slides, videos, or reproductions in books, and have their own sets of lessons and activities. Since art teachers characteristically have restricted budgets, they often do not have sufficient visual resources (Heise and Grandgenett, 1996).

Some teachers who support creativity often rely on students' natural curiosity. They offer exercises and activities that encourage students to find insightful solutions to problems, rather than asking many questions. An important teaching goal is to help students to become more creative. Plans that can encourage students' creativity include brainstorming, providing an appropriate learning environment, not over-controlling students, fostering flexible and playful thinking, encouraging students internal motivation, and invite some creative people to the class (Santrock, 2004).

An interesting case study from the designing business excellence website provides a brief entitled 'dear architect'. This brief describes the vision of teachers and students about their new school building at Walker Arts and Technology College. Asking the teachers and students to be involved in design and architecture is an excellent idea and one that should be utilised more in future school buildings. The teachers and students use this building every day and are aware of its problems and how it best could be improved. This can then be relayed to the professional architect. For example, one of the requirements of the new building was to improve natural light flow into key subject areas such as art and technology which will ultimately enhance pupil performance and enjoyment. They also stipulated that learning opportunities should be possible in any location around the school. This will give students a broader learning experience (Design Council, 2010).

2.10 Summary

This contextual review has enabled me to consider a wider context of influences upon perceptions of creative thinking and practice and to identify gaps in knowledge and needs for further research specifically regarding the art classroom. It also serves to inform the initial investigation in terms of the broader discussion of observed and recorded influences. This approach began by considering definitions and aspects of creativity. These definitions and literature references provided a detailed insight into the topic and its key influences. The influences of learning environment on perceptions of creative thinking and practice were considered important enough for

researchers to investigate in a number of countries, internationally, but none in Saudi Arabia. For example research into perceptions of classroom environment, none of which were art classrooms, were carried out in Taiwan (She and Fisher, 2002; Huang and Fraser, 2009), Israel (Khalil and Saar, 2009), USA (Walberg, 1969b), India (Mayya and Roff, 2004) and Australia (Fraser and Rentoul, 1980).

The main focus of this contextual review became adolescent girls in intermediate schools, because in this period of education art is not an optional subject, in addition to which it was found that art classrooms were not previously investigated in Saudi Arabia in terms of influencing factors, and therefore this review identified a Saudi Arabian gap in knowledge. The issues facing adolescent girls in Saudi Arabia were then explored, including the theory of adolescent psychology and creative thinking which helped the researcher to understand some important psychological characteristics with regard to students and how to effectively manage and interact with them. The most important characteristics were found to involve moodiness, anger, anxiety, and self-esteem.

The chapter then considered a number of specific factors of the learning environment, involving a systematic review of classroom design elements and their effect on students and on their creativity and behaviour. Factors of the physical classroom environment were considered such as ventilation (Wilson, 2002), temperature (Kolleeny, 2003) and noise (Lundquist *et al*., 2002). Given the nature of the subject being studied (art), the appropriate lighting (James, 2001) and the colour of the wall (Birren, 1988) were discussed in some detail, while the general considerations of space management were found (Savage and Savage, 2009) to be applicable in the art classroom as in any classroom.

The literature review showed that there are a number of research projects that would be of value to carry out in Saudi Arabia, to qualify whether the influence and impact of such interventions was comparable within this culture. The outcome of this review then determined that a review of methods should investigate the possibilities for interventions involving modifiable elements within art classrooms.

It can be noted that an extended review of environmental influencing factors was written as a booklet guide for Saudi Arabia, in the Arabic language (Appendix 1),

translating key knowledge from western publications about the content and importance of the art classroom environment to be distributed to schools in Saudi Arabia. The aim of this booklet was to point out the impact of the art classroom environment on student's creativity, from a broad contextual review. This booklet was first sent to the Ministry of Education, to get official approval and to be distributed officially by them to schools. This process usually takes a long time to progress from different department to department.

Chapter Three: Research Methodology

3.1 Introduction

This chapter reviews research methods for investigating educational environments, with a particular focus on methods for studying perceptions of creative learning experiences in terms of student thinking and practices, including methods used by researchers discussed in the contextual review. The aim is to determine an effective method to investigate the research question: *Is it possible to improve perceptions of creative thinking and practices, of adolescent girls in Saudi Arabia, through control of art classroom environments?*

The chapter begins by covering basic considerations which informed the methodology, before a critical review of specific approaches in terms of the needs of this investigation, leading to the selection of methods for this programme of research.

3.2 Qualitative and Quantitative Research

Qualitative data is descriptive data that provides depth and detail, whereas quantitative data involves the collection of numerical data. Gilbert (2001) argued that qualitative research is concerned with social processes and utilises techniques such as non-participant observations and participant and unstructured interviews as a way of getting close to the data and studying social interaction in its natural surroundings. In other words, 'the methods used by qualitative researchers exemplify a common belief that they can provide a "deeper" understanding of social phenomena than would be obtained from a purely quantitative methodology' (Silverman, 2006,p.56). Therefore, the use of such methods is 'useful in supplementing and illustrating the quantitative data obtained from an experiment or survey' (Robson, 1993:456).

Qualitative designs are naturalistic to the extent that the research takes place in real world settings (Patton, 2002:39). Qualitative research, broadly defined, means 'any kind of research that produces findings not arrived at by means of statistical procedures or other means of quantification' (Strauss and Corbin, 1990:17). 'Where quantitative researchers seek causal determination, prediction, and generalisation of findings, qualitative researchers seek instead illumination, understanding, and extrapolation to similar situations' (Hoepfl, 1997,p.12).

Quantitative research is concerned with objective measurement and aims to quantify and describe behaviour. This type of research is easy to analyse as it involves numerical data, but this analysis often oversimplifies reality. Often it is found that a mixed methods approach can build on the strengths of both.

A previous study by Martin looked at the classroom environment and its effects on the practice of teachers, used a mixture of qualitative and quantitative methods to gather data from students and teachers in their working environment, by means of lesson observations and interviews (Martin, 2002). A visual analysis study by Collier also demonstrated the effectiveness of using both qualitative and quantitative methods. Collier achieved a large amount of qualitative data and also quantitative data which was then analysed statistically for correlations between the different variables (Collier, 2001). Both studies took place in the classroom environment and considered the relationship between the teachers and students.

In addition to observation and interview techniques for qualitative and quantitative research, there is intervention. Interventions are manipulations of situations, as opposed to simulations of scripted situations. Following an intervention, participants may be observed and/or interviewed. The focus with an intervention study is to determine the degree of influence on participants or environment, of specific variable components of the intervention. A variable can be defined as a class or category of objects, an event or situation. Leedy and Ormrod defined the Independent variable as the available variable 'that the researcher directly manipulates' and the dependent variable as 'a variable that is potentially influenced by the independent variable' (Leedy and Ormrod, 2010,p.224). An extraneous variable is 'any variable, other than the independent variable, that might affect the dependent measure in a study' (Graziano and Raulin, 2010,p.56). Weinstein, in her research, 'the physical environment of the school: a review of the research' stated that the classroom is a system with many inter-linking and conjoined variables. In undertaking research in any classroom environment the problems of control are going to be an issue. Weinstein realised the complexity of studying environment-behaviour relationships and suggested that in designing and interpreting these results we need to reflect this complexity (Weinstein, 1979). It should be noted that in any qualitative or quantitative investigation of people and their behavioural environment the researcher

can create the Hawthorne effect (Robson, 1993) where their mere presence can have an impact upon perceptions of, and responses to, observed conditions.

3.3 Contextual Review of Methods

Methods need to be well considered and designed, to appropriately investigate a research question. Some researchers use a single method while others use a combination of research tools for example, a triangulation approach. According to Cohen *et al*., (2007) and Zeisel's (1984) suggestion it is possible to improve research quality by using several methods to tackle one problem. According to Zeisel, 'the appropriate mix of methods will be the one that enables you to achieve your ends with the greatest control over side effects' (1984,p.229). This section considers observations, interviews and questionnaires.

3.3.1 Observation

Observing behaviour means systematically watching people's interactions with their environments, recording these interactions in different ways, and describing, analysing and interpreting what was observed (Robson, 1993). This research method of observation provided data on the ways in which the physical environment supports or interferes with the behaviour of groups and individuals (Zeisel, 2006). According to Zeisel (2006), observing behaviour in physical settings will produce data about regularities of behaviour, uses and misuses of a place, people's activities and the relationships required to support them and the behavioural opportunities and constraints that environments afford.

3.3.1.1 Behavioural Mapping

Behavioural mapping is 'a very general technique for studying environmental influences on behaviour' (Ittelson *et al*.,1976). The technique of behavioural mapping has been used by environment-behaviour researchers such as Proshansky. This is an observational research technique for tracking the behaviour of individuals and their activities across time and space. It focuses on people's movement and various activities in existing spaces, and observes the type of behaviour that occurs in relation to these settings. It then attempts to identify the use of space as a cause of behaviour (Ittelson *et al*., 1974; Edwards, 2005). 'It is empirical, describing observed

behaviour both quantitatively and qualitatively. There are two components to this: the description of the environmental setting; the description of the subject; characteristics and description of the behaviour' (Edwards, 2005). Rivlin and Rothenberg used behavioural mapping to study the complex relationship between the physical structure and arrangement of the room, teacher, students and the distribution of space. Their study looked at eight open education elementary classes, gathering data on the locations and activities of students and teachers. Their findings were that in seven out of the eight classrooms the teacher's prime location was in the front of the room (Rivlin and Rothenberg, 1976).

Mapping is a method of studying behaviour in its functional relation to a particular environment by collecting accurate records of a person's activities at a particular time in a specific area. Often, people's behaviour will vary according to the opportunities or limitations of the site in which they are located. This observational study describes the connection between individual behaviour and the environment. Having been performed without the individuals' knowledge, it allowed the individual to react and behave normally. The technique is a reliable one and rigorous enough that behavioural categories can be used as dependent variables within an experimental framework (Ittelson *et al.*, 1974).

The standard procedures for behavioural mapping are as follows:

1. Identification of observational categories. This is done by observing the area to be mapped and recording observed behaviour in a narrative style. These narratives are then analysed for major behavioural categories relevant to the study that is being conducted. The emphasis is on overt, easily identifiable behaviours requiring a minimum of inference.
2. Identification of the mapping area. This may be the room, street or playground that is under observation.
3. Preparing instructions and observation forms for the observer. This permits them to record who is exhibiting which of the behavioural categories in what locations.
4. Preparation of an observation schedule. In most schedules, the entire physical space to be mapped on a time sampling basis is covered typically

every fifteen minutes. Variations include continuous observation of smaller areas and sampling of spaces as well as times (Ittelson *et al*., 1974).

Behavioural maps can be used in four ways. Firstly, they can be used to describe what behaviours actually occurred in a particular place. Secondly, they can be used to contrast behaviours. For example, they can be used to compare behaviours between men and women, or variations in the behaviour of a single individual, depending on whether they are alone or in a group. Thirdly, mapping is also a research tool; the information collected will influence the development of general principles about the use of space in different settings. Finally, maps enable the prediction of behaviour in the context of certain kinds of space, thus making it possible to design specific facilities more effectively in advance of occupancy (Ittelson *et al*., 1974).

Behavioural maps are both qualitative and quantitative; they record types and degrees of behaviour in a systematic and reliable manner. It is essential that the information collected for such maps is reliable. Behaviour always arises in some particular space without any limits; this technique explores the relationship between behaviour and space. The architects' floor plan, which is the prototype of all behavioural mapping, involves a drawing of the site on which people's activities are indicated, with each area marked to match the actions seen from a particular angle (Ittelson *et al*., 1974).

According to Ittelson *et al*. (1976), behavioural mapping is a technique that gives a reliable and exact description of the environment and the behaviours that occur in a specific setting. Before any study is carried out, decisions have to be made, as to whether the subject of tracking is one individual or a group of people, whether the observational study is periodic or continuous and what kinds of behaviours are relevant to the problem studied. Potentially, any type of behaviour can be recorded on a behavioural map.

An example of behavioural mapping would be the work of Martin (2002) who investigated the design of classroom environments and the impact of these environments on the practice of teachers. Martin investigated primary and secondary schools, using lesson observations and teacher interviews. This enabled examination

of behaviour alongside statements of attitudes and beliefs about the role of the classroom environment. Behavioural mapping example Figure: 3.1. The example is a multiple activities centre classroom organised in groups with the teacher's mobility tracked.
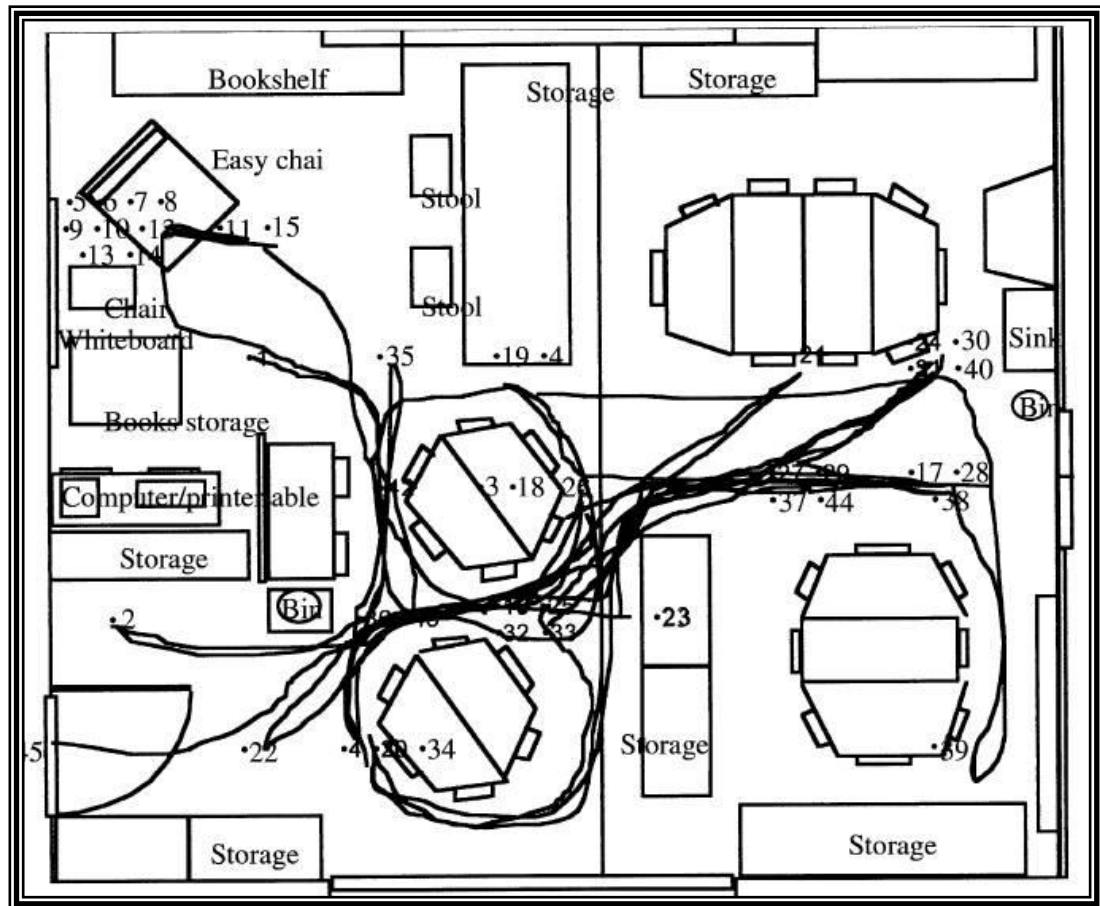
Figure 3. 1: Behavioural mapping example. (Martin, 2002, p. 145)

3.3.1.2 Visual analysis

Even though no text specifically considering visual analysis of interior spaces was identified, Van Leeuwen's work has provided a suitable method for the process of visual analysis. Working with Kress, Van Leeuwen developed three different ways to structure a visual analysis: 'Like linguistic structures, visual structures point to particular interpretations of experience and forms of social interaction' (Kress and Van Leeuwen, 1996,p.2). They used the basis of linguistic analysis and the work of Roland Barthes to produce their three factors. These factors are representational, interactional and compositional. Each factor needs to be systematically considered in a visual analysis. Representational factors involve the extent to which an image

represents the world (abstract or concrete). Interactional factors involve the way that an image creates particular relations between the viewers and the visual arrangement. Finally, the compositional factor involves the layout, placement, point of view and relative salience of the picture. Spaces are visual arrangements which can be analysed in terms of layout, 2D and 3D features, use, form and structure. Van Leeuwen's research has suggested that interpreting these features of an interior space through visual analysis is practical and valid.

One of the most valuable architectural books called 'DBook' details the visual analysis of sixty-four collective projects for example houses, schools and universities. These projects vary in worldwide location, and architects were often working with limited spaces and extremely dense urban areas. For each project the authors analysed a number of features including collective space, floor area, population density and a map of the location of the city in its context. They interpreted various visual analysis features such as the use of 2D and 3D spaces and other elements of construction as mentioned in chapter two. All of these projects acknowledged and incorporated the natural environment in their building and tried to integrate the outside into their structure. A number of these projects focused on regenerating old industrial sites or wasteland (Fernandez Per *et al*., 2007).

Another technique to visually analyse space as mentioned by Collier (2001), is 'a basic model for analysis'. In the first stage the researcher should look at the space as a whole, then write down an inventory of what they want to research, the third stage involves structuring the analysis and the final stage draws conclusions based on significant findings (Collier, 2001, p.39). Collier's own study demonstrated his use of the basic model for visual analysis. He used a very controlled and time-consuming process involving a number of variables within a school in San Francisco. The 'Cantonese Bi-lingual study' investigated non-verbal factors that affected student response and behaviour in Cantonese bilingual classes. Within this study he considered precise proxemic relationships, tracking of behaviour, details of gesture, posture and other visible variables: 'The fieldwork phase created a huge collection of film, video and still photographs of classes from pre-school to fifth grade'. His observations revealed that there were significant differences between the students' behaviours when Cantonese was spoken compared to when only English was used

(Collier, 2001). Collier's study demonstrated the very structured nature of performing a visual analysis.

3.3.2 Interviews

According to Robson (1993), interviewing has become a very popular method of data collection in many fields. It is a highly efficient technique for the collection of qualitative data, as it allows the researcher to gather information from several people at the same time, thus maximising the amount of material collected. It is particularly useful when the aim is to allow people to discuss their opinions or experiences in a relaxed and spontaneous setting, to help them reflect and open up about the subject of interest.

There are many different ways of interviewing, which can be performed one-to-one or in a group; the individual interview is commonly conducted by telephone because this saves time. According to Robson (1993), different interview types and styles are as follows:

- Fully structured interviews use standardised questions with fixed wording, usually in a pre-set order.
- Semi-structured interviews use fixed questions, but both the order and the wording can be changed and explanations given, depending on the interviewer's perceptions.
- Unstructured interviews are informal conversations on a general area of interest and concern, and are allowed to develop freely as they take place.

There are advantages and disadvantages to interviews as a method of data collection. Among the generally recognised advantages of interviews are:

- The questions can be set in advance.
- They provide a flexible and adaptable way to explore points of interest.
- One-to-one contact offers the researcher the possibility of modifying their line of enquiry, which other ways of data collection, such as postal contact, do not allow.
- Results are obtained immediately.

However, there are also some disadvantages to the interview method:

- It is a time-consuming process.
- Much planning is required before an interview can be conducted.
- Undertaking an interview requires advanced interpersonal skills.

(Robson, 1993)

Related research which used interview techniques to investigate aspects of education included the following studies:

Freiberg described how using student interviews and finding out about the student's perceptions of their learning experiences can be a superb way of measuring the effectiveness of a school learning environment. He used interviews with a random sample of students who were graduating from high school. Each student was provided with just four questions which would enable Freiberg to elicit information about the school climate:

1. 'What do you like about your school?
2. What was your most memorable experience in high school?
3. What area would you like to have improved in your school?
4. What is the one message you would like to give your teachers?'

Freiberg (1998)

In another study investigating teacher and student perceptions of creativity in the classroom environment Fleith (2000) used a number of interviews with 31 students (Grades 3 and 4) and 7 teachers from Connecticut public school. The purpose of the study was to research different characteristics in the classroom environment which may either increase or inhibit creativity development (Fleith, 2000). In her interviews with both teachers and students she chose to employ a semi-structured interview with open-ended questions. Interviews were used as she was very keen to collect rich descriptive data in the subjects' own words that would help her study of perceptions and individual experiences.

The individual teacher interviews were carried out in various school rooms, library or conference room. Fleith's interview questions consisted of a range of topics such as a description of the classroom, the teacher's opinion of the activities students liked most; a description of a environment that enhances/inhibits creativity and a definition of creativity.

The students were interviewed in focus groups and the questions considered the same topics such as what is creativity, three things the student would like to change in their classroom and materials they used in the classroom. Fleith had chosen the focus group method as she believed it would enable young students to provide verbal input (nine groups of three students and one group of four students). All interviews conducted in this study were tape recorded and then subsequently transcribed. Fleith recommended that there should be alternative ways to assess the classroom environment in future studies into creativity such as the use of observation, behaviour mapping and questionnaires.

3.3.3 Questionnaires

The questionnaire is a widely used and effective instrument for collecting survey information. This is because it offers structured, often numerical data, which can be administrated without the presence of the researcher and is often comparatively straightforward to analyse (Wilson and McClean, 1994).

There are two basic goals of questionnaire design:

- To obtain information related to the purpose of the survey.
- To collect this information with maximal validity and reliability.

These goals are called relevance and accuracy. To ensure relevance, the researcher should be clear about the exact kinds of data required in the study, the reason each question is asked and what will be done with the information collected. Accuracy is improved when the wording and sequence of the questions are designed to motivate the respondent and to facilitate recall.

It should also be noted that a questionnaire should not include questions merely because they are interesting. The questions must be designed to help accomplish the

goals of the research and, in particular, to answer the research questions (Robson, 1993).

When investigating perceptions and attitudes, a useful questionnaire format is the Likert scale, (Robson, 1993, p.257), which uses questions or statements to measure how much people agree/disagree. These can be set as odd or even numbered scales. The odd options allow a midpoint, whereas the even options force a decision from participants to get clearer findings. Nevertheless, results can be stronger and more honest if odd number scales are used when participants do not choose the midpoint. A three to seven point scale may be used, but the most practical has been found to be a five point scale: 'It is easy to respond to, straightforward to analyze, and sufficient for most needs' (Anderson, 1998, p. 174).

Related research which used a questionnaire approach to investigate aspects of education included development and use of the WIHIC tool, (What Is Happening In this Class). This tool is used for measuring affective factors and students' perceptions of their classroom learning environment. This questionnaire measures psychosocial aspects of the classroom learning environment. WIHIC consists of 7 scales and 56 items and was validated by a sample of 3980 high school students from Australia. It is now widely regarded worldwide and has been used with various subjects, different age groups and in 12 different countries. Students have to rate each item based on their perception of the learning environment. The seven scales are Student Cohesiveness, Teacher Support, Involvement, Investigation, Task Orientation, Cooperation and Equity. WIHIC can be used to gather information from students for improving teaching and learning in different classroom contexts. Although it is clear that perception is influenced by a wide number of factors and students' perceptions may differ considerably from teacher's perceptions (Aldridge & Fraser, 2000; Fraser, 1998).

Another questionnaire that has been used to measure students and teacher's perceptions is the teacher communication behaviour questionnaire (TCBQ). This was developed by She and Fisher, (2002), and used with secondary science students in Taiwan. These researchers found many advantages for using student perceptions as students are directly interacting and affected by the environment. This type of method saves money and time as you do not have to rely on trained observers.

Finally, it eliminates the Hawthorne Effect as observers in the classroom environment may alter the dynamics of the classroom.

The DREEM (Dundee Ready Educational Environment Measure) questionnaire (Mayya and Roff, 2004) was designed for a particular type of learning environment focused on students training in medicine and other health-related courses. The questionnaire consists of 50 items which look at students' perceptions of 5 separate components of the educational environment. These components are: perceptions of learning (PoL), perceptions of teachers (PoT), Academic self-perception (ASP), perceptions of atmosphere (PoA) and social self-perceptions (SSP). Maya and Roff compared the perceptions of academic achievers and under-achievers in the Medical College in India. The finding was that the educational environment was rated as average. The mean score of DREEM was significantly higher for the academic achievers with regards to perceptions about teachers, social self-perceptions and academic atmosphere, compared to under-achievers (Mayya and Roff, 2004) This questionnaire has now been applied to a number of undergraduate courses worldwide (Roff, 2005). Although this questionnaire provides information about problem areas for students they don't give any insight into reasons for the responses.

In review of these questionnaire formats it was decided that while they informed considerations of benefits of questionnaires, none were appropriate to the needs of this investigation. For example, the questionnaire length and the style of questioning were often inappropriate. The DREEM questionnaire was designed for a specific type of learning environment focused on students training in medicine and other health-related courses, (Mayya and Roff, 2004), and so in the end questionnaires were created especially for this investigation.

3.3.4 Tests

Regarding the measurement of creativity, Torrance is best known for his development of the Torrance Test of Creative Thinking (TTCT) in 1966. There are two forms (A and B) of the TTCT-Verbal and two forms (A and B) of the TTCT-Figural. However, in this technique there are six verbal activities such as Asking, Guessing Causes, Guessing Consequences, Product Improvement, Unusual Uses, Unusual Questions and Just Suppose. As well as three activities for the figural such

as Picture Construction, Picture Completion, and Lines/Circles (Cropley, 2000). The TTCT has been translated into more than 35 languages (Millar, 2002). It is the most referenced of all tests of creativity (Lissitz and Willhoft, 1985). This is an influential test used throughout the world.

According to Cramond *et al.,* (2005), the TTCT can provide some information about students that other assessments do not readily measure, whether for curriculum development, identification, or both. The presence of open-ended items in this test enables students to express their interests, fears, hopes, and knowledge about various topics, and emotional states. This then provides teachers with further information about how their students think through an activity that most children enjoy.

The TTCT consists of some relatively simple verbal and figural tasks that include divergent thinking as well as other problem solving skills. The tests can be scored as follows:

- Fluency
- Flexibility
- Originality
- Elaboration

Verbal subtests include issues such as asking questions, guessing causes, guessing consequences, product improvement, unusual uses, and unusual questions based on just suppose. The figural subtest covers issues such as picture construction, picture completion, circles, or parallel lines (Crockenberg, 1972).

For an assessment item in 'unusual uses' approach, the researcher asks for unusual uses for everyday objects: 'how many uses can you think of for a tin can or book? The tin cans (or book) could be of any size and you can change them in any way they can be changed'. The answers are scored for fluency, flexibility and originality. The following categories and/or responses have been eliminated from the tin can task:

- Container (unless the container use is really surprising, unheard of, etc.).
- Dipper or water glass
- Destruction or waste

- Growing plants

- Noise maker

- Recreation (unless it is something really surprising or unusual). Such recreational uses as "kick the can" and "stilts" are eliminated'.

(Torrance, 1962,p.239)

Torrance's non-verbal assessment items include such things as the 'incomplete tasks'. Figure 3.2 demonstrates exercise samples of incomplete task and the one calling for improvement (Torrance, 1970, p.11).
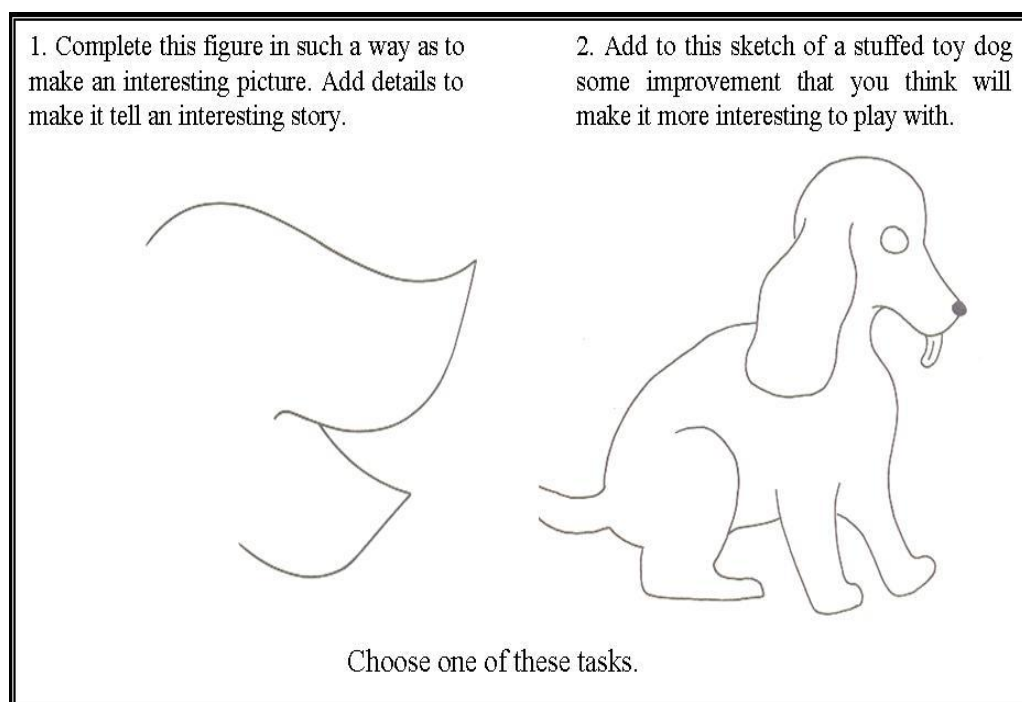
Figure 3. 2: Exercise samples of incomplete task and the one calling for improvement (Torrance, 1970,p.11)

'One of the criticisms of the unusual-uses approach had been its heavy reliance on verbal ability. By using incomplete drawings, the nonverbal aspects of creativity could be called into the assessment process. There is no single 'correct' procedure for the assessment of divergent thinking' (Sprinthall and Sprinthall, 1977,p.511).

Wallach's and Kogan's are also measures of ideational fluency and uniqueness, assessed through five tasks: Alternate Uses, Similarities, Pattern Meanings, and Line Meaning. The pattern and line meaning tests use other techniques involving visual

rather than verbal stimulus materials. They can be introduced as a game to the child. The pattern meaning procedures consists of eight items. For example, different drawings appear on a separate card, and the child is requested to consider each drawing as a complete entity for producing his responses. The original procedures were probably those that were derived from the work of Tagiuri (1960). Wallach and Kogan created the line-meaning test when the child is confronted with a type of line and is asked to generate meanings or interpretations relevant to the form of the line in question. In addition , the child can turn it any way he or she wants (Wallach and Kogan, 1965, p.33-36). Figure 3.3 shows three examples of stimulus materials for the pattern and line meaning procedures expounded by Wallach and Kogan, 1965.
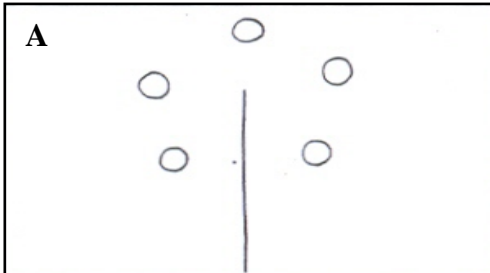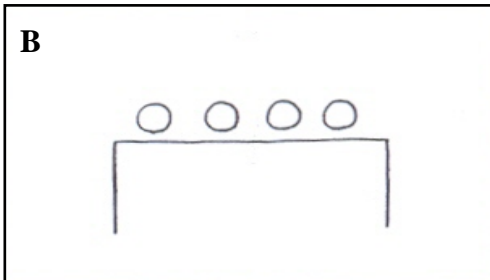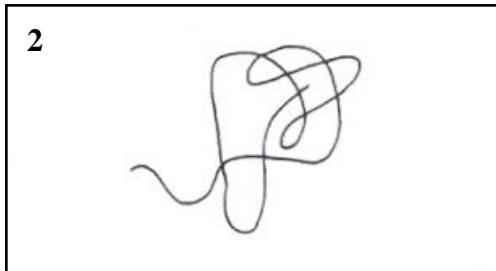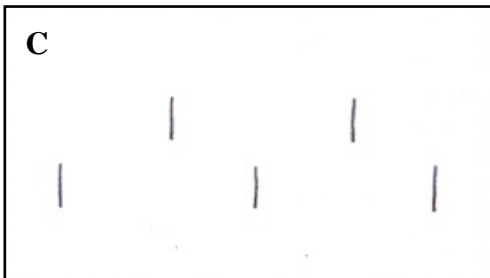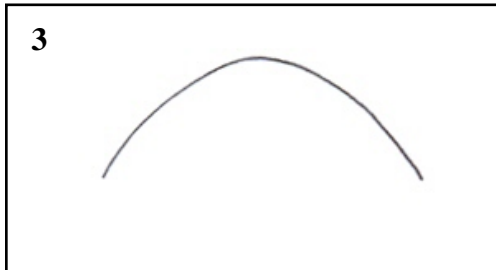
No	Unique Response	Common Response
Stimulus materials for the pattern meanings procedure		
A	Lollipop bursting into pieces	Flower
B	Foot and toes	Table with things on top
C	Five worms hanging	Raindrops
Stimulus materials for the line meanings procedure		
1	A squished piece of paper	Mountains
2	Squeezing paint out of a tube	A piece of string
3	Fishing rod banding	Rising sun

Figure 3. 3: Three examples of stimulus materials for the pattern and line meaning procedures (original cards, 4 in. x 6 in.) (Wallach and Kogan, 1965,p. 34 and 36).

There is another creativity test called the Remote Associates Test (RAT) that was developed by Mednick and Mednick (1962). In the 40-item RAT, the student is offered three words and is asked to give a fourth word that is related to the other three words. The three words are considered to be from remote associative clusters and the fourth word is to provide a mediating link between them, such as: base snow dance … (the required word is ball) (Backman and Tuckman, 1972).

Even though the classification of creativity is a work in progress, Sternberg and Lubart (1999, p.7) suggested some positive and negative effects of psychometric testing on the field of measuring creativity. Positively, research is facilitated by straightforward and objective assessment devices. Negatively, the value of non-'significant productions' i.e. paper-and-pencil tests are often criticised as being inconsequential. It is also argued that 'fluency, flexibility, originality, and elaboration scores failed to capture the concept of creativity' (Amabile, 1983). Other researchers reject 'the assumption that non-eminent samples could shed light on eminent levels of creativity, which was the ultimate goal of many studies of creativity' (Sternberg, 1999, p.7).

Torrance (1979) noted that the psychometric study of creativity was essentially dichotomous:

> Creativity tests tend to be of two types - those that involve cognitive-affective skills such as the Torrance tests of creative thinking [...] and those that attempt to tap a personality syndrome such as the Alpha biological inventory [...] Some educators and psychologists have tried to make an issue of whether creativity is essentially a personality syndrome that includes openness to experience, adventuresomeness, and self-confidence and whether the cognitive processes of rational and logical thinking in creative thinking are precisely the same as those used by high-IQ children (Torrance 1979:360, from Handbook of Creativity Sternberg, 1999, p.36).

3.3.5 Validity and Reliability

The validity and reliability of the research techniques, namely the observations, interviews and questionnaire, must be examined before they are selected for application. McMillan and Schumacher (1997, p.404) defined the validity of qualitative designs as 'the degree to which the explanations of phenomena match the realities of the world'. Cohen *et al* defined the qualitative data 'the subjectivity of respondents, their opinions, attitudes and perspectives together contribute to a degree

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of bias'. They suggested that 'reliability is a necessary but insufficient condition for validity in research; and validity may be a sufficient but not necessary condition for reliability' (Cohen *et al*., 2007, p. 133).

According to Kumar, (2005), there are three types of validity including:

- Face and content validity
- Concurrent and predictive validity
- Construct validity

Face validity is one of the most common types of validity and it refers to whether a measure appears on the surface to have measured what it is supposed to measure. Kumar pointed out that each item on a scale should have a logical link with the objectives. In this case, face validity is the establishment of this link. Content validity is the assessment of the items or questions statements to ensure that they represent and cover the full range of the issues they are supposed to measure, as judged by the researcher and experts in the field (Kumar, 2005). Concurrent validity is how an instrument compares to an already validated measure. Predictive validity is how an instrument can predict a particular outcome. Construct validity should demonstrate an association between the results obtained and the theories that underpinned the research. This type of validity is more sophisticated and involves using statistical tests (Kumar, 2005).

Reliability of a given research method, 'means that two or more researchers studying the same phenomenon with similar purposes should reach approximately the same results' (Gummesson, 2000, p.91). 'For the research to be carried out on a similar group of respondents in a similar context, then similar results would be found' (Cohen et al., 2007,p.17). Reliability is more often achievable with forms of quantitative research, which involves methods that require control and manipulation of phenomena. In qualitative research, reliability can be regarded as a fit between the data that is recorded and the events that actually occur in the natural setting that is being researched, which means that a degree of accuracy and comprehensiveness of coverage is required (Bogdan and Biklen, 1992, p.48).

Due to their anonymity, questionnaires tend to be a more reliable measure of respondents' attitudes than interviews. However, the reliability of an interview can be improved through the careful piloting of interview schedules, training of interviewers and use of closed questions (Silverman, 2006).

The two main aspects of reliability are stability, which is consistency over time, and internal consistency. The stability of any given research instrument is measured through its test-retest reliability: its ability to produce the same results when administered to the same subjects under the same circumstances, but at two different points in time. The variation in the scores thus obtained reflects the research instrument's degree of reliability; therefore, if the score can be repeated, the instrument is reliable. Conversely, internal consistency concerns itself with whether an instrument's items are congruous with each other and working towards the same direction (Punch, 2006). Evaluation of this aspect requires the application of Cronbach's alpha reliability coefficient, a statistical procedure that correlates every test item with each other, with little error. Cronbach's alpha reliability coefficient normally ranges between zero and one. Using this coefficient, a score over 0.7 is acceptable while a score great than 0.9 is excellent (George and Mallery, 2003).

3.3.6 Pilot Study

Piloting of methods is crucial for identifying weaknesses or errors with the process, ensuring a tested method is used in the main study. Buckingham and Saunders (2004), recommend that a draft questionnaire should be tested before it is used because mistakes in questionnaire design cannot be rectified once fieldwork has begun. The easiest way to test a questionnaire is by administering it to friends and colleagues. This helps the researcher evaluate the amount of time it takes to complete, and reveals any obvious problems in the wording of questions.

The purpose of a pilot study is to find out if the questionnaire works, and to make sure that the collected data can be analysed in the way the researchers wish (Buckingham and Saunders, 2004). Another reason for piloting the questionnaire is to test its clarity and layout (Cohen *et al*., 2007).

A pilot study is not to be confused with a preliminary study, for example a pre-interventions study, which serves to inform the researcher of appropriate variables for manipulation by intervention, and qualifies choice of method(s).

3.3.7 Learning Environment Indicators.

As described in the previous chapter there are a number of researchers who have already made some headway in investigating interrelationships and influences within learning environments. One approach has been to develop tools as indicators of change in learning experience. Environment assessment instruments which have been used extensively include the Classroom Environment Scale (CES) developed by Trickett and Moss (1973) and the Learning Environment Inventory (LEI) developed by Walberg (1969). However, these scales were very time-consuming and lengthy.

Therefore, Fisher and Fraser developed a unique and more manageable perceptual technique to measure students' perceptions of their classroom environment. They compiled two sets of the same inventories based on the ICEQ (Individualised Classroom Environment Questionnaire) and the CES. They are termed the 'Actual Version' and the 'Preferred Version' of classroom environment inventory. The inventories are used to study the degree of similarity between the perceived environment of their classroom and the ideal classroom environment. The study took place in Australia in a junior high school. The sample was 2175 students in 166 science classes. The findings were that students preferred a better classroom environment than was actually in use and teachers thought that their classroom was more preferable than the students (Fisher and Fraser, 1983). Their technique has been found to be representative and the inventories have been accepted by contemporary researchers. Furthermore, they have since developed these inventories to assess a variety of different grade levels and different learning contexts. There have been worldwide studies in countries such as Taiwan, Thailand and Brunei, using these perceptual measurement tools. These cross-cultural studies demonstrate the effectiveness, reliability and validity of these perceptual inventories.

The 'Actual-Preferred Version' can also be developed to investigate the match between students' perceptions of classroom environment and their academic achievement. Will students perform better when they are in their preferred

environment? This is termed the person-environment fit and has stimulated further research into the match between learners and their environment. It is hoped that this information will be able to help learners to be more successful in their studies and reaching their true potential.

Research by Tan Ai-Girl investigated student teachers' perceptions of teacher roles in enhancing students' creativity in the classrooms. 140 student teachers studying at the National Institute of Education in Singapore participated in a paper-and-pencil survey rating teacher characteristics that were important for fostering creativity of primary school students and secondary school students on a 9 point Likert scale (Ai-Girl, 1999).

Indicators and inventories do take time to develop and to test for reliability, and tend to be for specific aspects of experience, which means they are not always appropriate to apply as an off-the-shelf solution to data gathering unless there is a match with purpose. Also, in the same way that using an indicator format with different questions would need testing for reliability, so would translation into a different language.

3.4 Related Studies of Learning Environment Factors

Grangaard (1995) investigated colour and light and their effects on learning ability. His sample was a small group of eleven elementary school students. This was a repeated measures experiment. The first classroom was a standard classroom with white walls and cool-white fluorescent lights. The second classroom was modified and had full-spectrum lights and light blue walls. Methods used in this study were videotaping students 15 minutes in the morning at the same time each day and 15 minutes in the afternoon. The students were recorded over a period of ten days. Their blood pressure was also taken morning and afternoon over the same time period. The students were recorded in two different classrooms and the researcher was investigating the number of off-task behaviours the students performed and whether this was due to the colour and/or light of the classroom. The findings revealed that the students in modified classroom with blue walls performed less off-task behaviours compared to when they were taught in the standard classroom. Even their blood pressure was reduced in this new classroom. The conclusion was that changing

the colour and lighting of the classrooms had an effect on the attention span of the pupils and their health.

Lundquist *et al.,* (2002) studied the effect of noise in the classroom environment. They developed a questionnaire as no existing instrument was directly appropriate for their target group. The mood-rating questionnaire they developed consisted of 12 items and they distributed this to students taken from 7th, 8th and 9th grades (13-16 years old). The sample was a mixed group of boys and girls. They used a range of classrooms and lessons to capture a more detailed overview of classroom situations and moods (Lundquist *et al.,* 2002).

Kuller and Lindsten, (1992) used the method of behaviour observation to study 90 school children in their learning environment. In addition, to observing various behaviours they also analysed morning urine looking for the stress hormone cortisol. It was found that working in windowless environments or with inadequate lighting disturbed the production of hormones and affected the immune system. The lack of light also had a major effect on the students' concentration and co-operation within the classroom. The researchers recommended that working in this type of environment should be avoided due to these results.

A study by Norback and Nordstrom investigated the effects of ventilation on student perception in a Swedish university. 355 university students were involved in the study and 31% were women. There were four computer classrooms that were used. During the first week two of the classrooms had increased airflow and two had a lower air exchange. The experiment was repeated a week later and the students remained in the same classrooms. However, the classrooms switched their airflow so each student experienced the different conditions. A questionnaire was given to students immediately after this second condition and they were asked about their immediate perception of the environment. They had to rate the perceived indoor air quality and also different aspects of the environment. Increased air exchange was associated with lower perceived temperature and better air quality. This also affected the perception of thermal comfort and overall indoor air quality (Norback and Nordstrom, 2008).

3.5 Critical Review of Methods and Limitations

While there have been a variety of interesting and effective approaches to gathering data, described above, not all of them are appropriate for use in Saudi Arabian educational environments. It has to be acknowledged as part of the critical review and selection process, to decide upon a research design, that there are a number of limitations involved:

1. Saudi Arabian schools are almost all gender segregated.
2. No photography or video recording is allowed in Girls Schools, for cultural and regulatory reasons.
3. There is no financial support available to pay for major changes like refurnishing or redecorating classrooms.
4. It will not be acceptable to modify the lesson delivery.
5. Teachers and students have little time to spare, so interviews and questionnaires would need to be short.
6. Questions will have to be given in Saudi Arabian, so any interview questionnaire selected or designed that is not in Saudi Arabian will need translation, and therefore have to be pilot tested for reliability first.
7. The content, format, and distribution of the questionnaires will have to be officially reviewed and approved by MoE, and with co-operation from the Head of School.
8. If any major modifications to the classroom are required they will have to be carried out by men, who will not be able to access these classrooms till after school hours, when the women and school girls have left.
9. The studies will need to be conducted during term times in Saudi Arabia, and these studies will need to be planned well in advance to deal with all the channels of approval.
10. Some art lessons can be cancelled at short notice, which can wreck scheduling of the studies.
11. Schools in Saudi Arabia are dispersed across large distances which can mean a lot of travel time in taxis, because women are not allowed to drive and there is no public transport.

As a result of these limitations it reduced many of the options which are available for studies in the west, and resulted in the research design outlined in the next section, which included, interview, questionnaire, and behavioural mapping approaches.

3.6 The Research Design Methods

From the review of methods for studying learning environments, it would appear that observations, case studies, and interviews of student/teacher perceptions are appropriate methods for data gathering. However, the constraints upon such investigations, regarding limits on changing lessons plans meant that it was not permissible to carry out creativity tests, so the creativity tests did not support the requirements of this research design.

It was decided to run this investigation in two stages. Pre-intervention was a study of typical art classroom learning environments and experiences in Saudi Arabia, including the perceptions of environmental factors and their influence upon learning experience in those art classrooms. This would identify which factors would make the most appropriate and informative to focus the main study on; the intervention study would take this selection of factors, identified in the pre-intervention study, manipulate them, and study the impact on student and staff perceptions of creative thinking and practices.

There were 50 schools considered for the sample group for this study, and the following criteria were used to identify comparable schools to investigate:

- A school applying the curriculum provided by MoE: International schools usually apply a bespoke curriculum dependent on its origin.
- Include both Private and Public schools: to include a wider range of art classroom environment and facilities.
- School size: number of students and classes. The class size needed to be 15 pupils in Private schools and 30 pupils in Public schools, to give sample consistency, as the majority of schools have classes of this size.
- Age of building (old and modern): this will allow me to assess the type of buildings and building styles that are currently in use in Saudi Arabia.

- Availability and continuity of art teacher: the teacher needed to provide a continuous presence and not be likely to be involved in long training sessions or on maternity leave. If the teacher changed during the study this could act as an additional extraneous variable potentially confounding the results.

- The co-operation of a school's administration and art teacher as well as their interest in the research into the learning environment: this will support the goals of research during all stages.

- Art subject schedule: to ensure that it fits with the research time schedule for fieldwork.

- Location of the schools: to select schools in various parts of the city that cover different cultures and socio-economic backgrounds, whilst being within accessible travel distances.

Once the schools were selected the study was ready to begin with the observations, interviews and questionnaires, using the following techniques.

3.6.1 Observations

Using the observations enabled a detailed examination of the classroom environment; the various design elements and the participants' interactions with their space. The interviews and questionnaires (self-report techniques) enabled the participant to discuss their own experiences of the space. This study used a qualitative approach to explore art classroom environments and identify factors that improve students' perceptions of creative thinking and practices.

The observations thus obtained arguably captured student-student interaction, student-teacher interaction as well as the interaction of students within their environment. Proshansky and Wolfe stated that little attention has been given to space planning within the classroom environment (Proshansky and Wolfe, 1975). Therefore, observations also considered the teacher's use of space in the classroom. These observations provided a source of additional information about the classroom and behaviour and these were recorded in detail. The resulting field notes contained two types of information: descriptions of teacher and student behaviour and

interactions, and my thoughts and ideas about the descriptions. All field notes were made during normal school hours (Appendix 2).

In this study, the art teacher presented me to students as a student researcher in art classroom environments, minimising the effect I could have on student behaviours thus enabling them to react and behave in as normal a manner as possible.

In this study, behavioural mapping was used as an observation tool. Art sessions at all three year group levels in each school were attended, and sketch-drawings were made of students' behaviour during these classes. The aim was to select a position that enabled a clear view without interrupting either the students or the teacher, and make a scheduled observation of the entire physical space every fifteen minutes, with notes continuously recorded.

Visual analysis was another important component of the study and the basic model of analysis was implemented during lesson observations. This was done with little intervention with students and no disruption of the lessons. It was then possible to evaluate performance driven factors that may impact perceptions of creative thinking and practices. This was then triangulated with lesson observations.

Visual analysis involved taking photographs of the art classrooms and undertaking a visual analysis of this data to determine 'connecting contrasting patterns' and possibly any other factors not identified. This followed the four stages of the 'basic model for analysis' (Collier, 2001, p.39).

The first stage involved taking photographs of each individual art classroom in the selected schools. These were then analysed as a whole, to record any question or issues that the photos elicited from me. The second stage then required photos to be categorised into themes, or by factors. The third stage involved the analysis of the photos to answer specific questions regarding: room size or number of tables, to be supported by descriptions. Lastly, the photos were reviewed again as a whole to draw up conclusions.

In this research visual analysis and the three factors outlined by Van Leeuwen proved relevant. The factor that was the most useful and salient to the study was the compositional factor. This helped me to analyse the classroom environment by

looking at the real classroom setting and the photographs. Barthes commented on the fleeting aspect of the image captured by a camera. A photograph can only provide a brief glimpse of one moment (Barthes, 1984). In my study I used photographs and real-life observations to analyse space and student behaviour in the classroom. It is not possible to take a picture of the students in Saudi classrooms due to cultural restrictions, so the photographs are ultimately limited and only provide a view of the classroom structure and displays. Real-life observations were crucial in the investigation as they provided us with rich details and showed interactions and relationships at work.

The variables and research methods listed below were used to identify the relationships between students, learning activities and use of space, and to show how these factors affect students' perceptions and practice. It was intended that the results of the study would form a useful resource for future research and development, and would be used to inform and improve the practice of art education in schools.

The following factors would be recorded and mapped during lesson observations:

- Classroom size (Shapson *et al*., 1980).
- The distribution and design of windows (Farley and Veitch, 2001).
- Classroom temperature (Schneider, 2002).
- Ventilation system (Fisk, 2000).
- Colour of walls (Birren, 1988).
- Floor covering and materials (Sommer and Olsen, 1980).
- Natural and artificial lighting (Kuller and Lindsten, 1992; Heschong, 1999; Benya, 2001).
- Noise and its sources (Day, 1999; Scott, 1999).
- Room design, including display materials and layout (Leung and Fung, 2005).
- Furniture (Sommer and Olsen, 1980).

3.6.2. Interviews

I chose to use interviews in my pre-implementation study as they can reveal richly detailed data which has high validity. Interviews were conducted with both art

teachers and students. This arguably allowed me to explore and identify factors that stimulate or inhibit students' creativity and trying of new things. Additionally, the interviews considered a secondary research question looking at in what ways do the students think the art classroom helps them in performing their tasks?

Two types of interviews were conducted with art teachers and students during the school visits. Firstly, unstructured interviews were conducted outside of class time and secondly, fully structured interviews were arranged according to a fixed schedule.

3.6.2.1 Teacher Interviews

Personal interviews were conducted with nine art teachers in different sites within the schools, such as the library, the art classroom and standard classrooms when students were not present. I chose a variety of interview locations in order to gain more generic responses and avoid the potential influence of asking questions only in the art class environment. The aim of the interview was to capture data about the teacher's comprehension of meaning with regard to creative thinking and of trying new things; application of this theory and knowledge to the art classroom environment; factors that inhibit or encourage students to try new things; data with regard to facilities; and lastly, any additional information that the teachers felt important. These interview questions also helped me consider secondary research questions which is are there any limitations on what teachers may do to control and manage the art classroom? (Appendix 3).

3.6.2.2 Student Interviews

The sample of student interviews was selected using a random number table with students from year group levels one, two and three in each of the participating schools. The interviews were conducted in different sites within the schools, such as in the library, art classrooms and standard classrooms. The aim of the interview was to capture data about general impressions; student comprehension of meaning with regard to perceptions of creative thinking and practices; students' perceptions of what they think are the 'best' activities undertaken in the art classroom; factors that inhibit or encourage trying new things; data with regard to facilities; and lastly, any additional information that the students felt significant. It is important to note that

questions two to four were in a different order to the teacher questionnaire because I needed to engage students with the interview; and the topic of risk-taking was a difficult topic to begin the interview with. Therefore, I started my interview with a question about creative thinking. This is a subject students are familiar with and often discuss (Appendix 4).

3.6.2.3 Pilot study of interviews

The organisation, structure and completion of the interview pilot study took place in Saudi Arabia. The MoE gave approval to access schools and to begin the process of the research including observation, interviews and questionnaires where the preliminary research tools were piloted.

The pilot study gave me the chance to review and make the required changes to the research tools to improve validity. These were related to repetition, simplifying certain terms, and the reordering of questions within the interview.

In the selected intermediate girls' schools in Jeddah, Saudi Arabia, observations and interviews involving art teachers as well as students were conducted. A reviewed Arabic translation of the questionnaire was printed and distributed to the students.

A pilot study was carried out with two art colleagues who were familiar with the curriculum and the art classroom environment. These teachers had experience at the intermediate school level and this curriculum. The numbers of teachers chosen for this pilot study were judged to be sufficient to collect a significant quality of data. After completing the study the wording of some questions was changed due to translation issues for example, the term risk-taking which should be interpreted specifically as trying new things as a creative practice. Also the order of the questions was altered to make it easier to understand. The questions chosen were formed from the literature review. These questions were open ended to give a more detailed response.

3.6.3. Questionnaire

The questionnaire for this study addressed the research question. This was undertaken after the contextual review to ensure that the contents were relevant to the study context. The questionnaire was first produced in English, and its contents then

refined in the light of comments received from experts in the field of education. It was then translated into Arabic by a qualified translator to ensure correct grammar, and that the meaning was the same as the English version thus allowing a more accurate comparison.

The questionnaire was then subjected to further refinement before the fieldwork in Saudi Arabia commenced. I requested that a professor in linguistics at Jeddah's King Abdulaziz University check the accuracy of the Arabic. He recommended that the original transcript be translated into the target language, checked for grammatical accuracy, then translated back into the original language and checked against the original and also advised that a pre-test should be undertaken before actual application.

The validity of the research questionnaire was supported by my supervision team and a panel of experts on educational research in addition to a field test at the King Abdulaziz University Jeddah, Saudi Arabia. In order to establish which type of validity to apply to the questionnaire, the objectives of the study were reviewed and the following questions addressed:

- Does the questionnaire measure what it intends to measure?
- Does it represent the content?
- Is it suitable for the sample or population?
- Is it comprehensive enough to collect all the data needed to address the aims and goals of the study?

After the questionnaire was designed, each statement in the research questionnaire was reviewed, and the extent to which it related to the goals of the research measured. A panel of experts from Saudi Arabian education were used to review the questions, and they suggested a number of changes to be made. These included revisions to the format of the questionnaire and the use of action words in the construction of the statements to be assessed on the Likert scale. Some statements were deleted, while others were added.

For the purpose of improving reliability of interpretation of the questions, the interview and questionnaire forms were translated into Arabic and then translated

back into English by two different translators to ensure accuracy and coherence. Before any conclusions were drawn from the analysed data, the reliability of the data was assessed in order to determine whether the results of the research were consistent, in terms of its measure of perceptions of creativity.

In order to test the reliability of the instrument, the translated questionnaire was then administered twice in a two week interval to 20 students that were not included in the sample. The Statistical Package for Social Sciences software (SPSS) was used to calculate Cronbach's alpha reliability coefficient, which was greater than 0.7, suggesting that the questionnaire was reliable enough to be used.

The pilot study was carried out on 20 students that were not included in the sample. Its purpose was to find out how long the questionnaire would take to complete, and whether the questions were understandable and the instructions clear. The subjects were chosen using a random number table, just like the actual study sample, with the aim of representing the latter as much as possible.

The results of the pilot study led to several adjustments, which were aimed at making the questionnaire more valid and reliable. These adjustments involved removal of repetition, more effective order of questions, and improving the choice of translated words used in the questionnaire.

3.6.3.1 Final Questionnaire

Before the questionnaire was distributed to the selected schools, approval to do so was obtained from the Education Authorities. The questionnaire was accompanied by a cover sheet explaining the purpose of the study, encouraging respondents to participate and assuring them of anonymity and confidentiality.

Each questionnaire was assigned an identification (ID) number, which appeared on all its pages. The ID number consisted of two components, the ID number of the school and the class. The questionnaire and its contents are described in detail below.

One hundred questionnaires were distributed to randomly selected students from levels one, two and three in each of the participating schools. It was expected therefore that approximately nine hundred questionnaires would be distributed.

The questionnaire covered different factors of the art classroom environment, including its physical, social, cultural and emotional characteristics, and their effects on students' creativity and ability to try new things. These are based on the influences of the art classroom as identified in the literature review, as follow:

1. I am interested in Art / I am not interested in Art.
2. I prefer to take art sessions in our art classroom.
3. The ventilation in our art classroom creates a good environment for creativity and trying new things.
4. The temperature in our art classroom has a negative effect on my creative ability.
5. The lighting in the art classroom is helpful in doing art tasks.
6. During art sessions, student noise has a negative effect on my creative ability.
7. The location of our art classroom is suitable and has a positive effect on my creative ability during art sessions.
8. The design of our art classroom helps me to try new things in art tasks.
9. The furniture in our art classroom is suitable and comfortable. It increases my ability to try new things in art tasks.
10. The layout of our art classroom helps me to try new things in art tasks.
11. The work display in our classroom inspires me to be more creative.
12. The colour(s) of our art classroom walls helps me to concentrate and makes me more comfortable.
13. The sink helps me to try new things in my art tasks, by allowing me to wash my hands and tools.
14. Generally, I find the art classroom supportive of trying new things in art tasks.
15. The art curriculum helps me to try new things in art tasks.
16. The provision of tools and materials helps me to try new things in art tasks.
17. Marks encouraging me to try new things in art tasks.
18. Positive teacher behaviour encourages me to try new things in art tasks.
19. The use of technology encourages me to try new things in art tasks.
20. The use of library books in our art classroom encourages me to try new things.
21. Co-operation with other students is one of the most important factors in encouraging me to try new things.

22. What are the most important facilities that you need in your art classroom to help you try new things and to be more creative? (Appendix 5).

3.7. Research Design Overview

This research design was undertaken in the following stages, to provide indicative evidence of influence on perceptions of creative thinking and practice.

3.7.1. Pre-Intervention Study

A selection of Private and Public Schools were identified through the MoE list, using the selection criteria listed under 3.6. In addition, consent was required for access to carry out the study, informing the staff of only a general interest in educational experiences in art classrooms, so as not to inform responses to questions.

The three approaches of interview, questionnaire, and behavioural mapping were used to identify both the range of environmental factors and perceptions of importance as influencing factors. Behavioural mapping involved photography of the empty classrooms and the recording of room layout, including furnishings, displays, storage, windows, etc. This provided the context for the observational notes of student and staff interactions during art activities.

Analysis of the student rated responses concerning environmental influences informed which two environmental factors to use for the main intervention study, and in conjunction with the methodological review, determine the most appropriate way to carry out the intervention study.

3.7.2. Intervention Study

The Public and Private schools were returned to, this time divided into three Group conditions:

Group 1: Manipulation of variable 1 (Table and Seating Arrangements).

Group 2: Manipulation of variable 2 (Wall Displays).

Group 3: Manipulation of variables 1 and 2 (Table and Seating Arrangements, and Wall Displays).

More discussion of the selection of these variables will be covered in chapter 4, but key considerations involved the relative ease of manipulation of environmental factors and their anticipated impact on learning experience.

The aim of these interventions was to indicate whether there were any significant differences in impact to creative thinking and practice between manipulations of factor 1 and 2; and secondly whether combining manipulations of factors 1 and 2 had a greater impact than a single factor manipulation.

Following setup of each of the conditions, the classrooms and their occupants were then left to settle into the manipulated environments for a wash-out period of three weeks before the data gathering began, to reduce possible Hawthorne effect (Robson, 1993) of response to immediate change.

Questionnaires and behavioural mapping were repeated in each case, to compare pre- and post-intervention data, to provide indicative results of the impact of each condition on creative thinking and practices.

These findings could only ever be indicative because of the number of extraneous variables which can influence the data, but the averaging of results would even out some of the deviations. The results should then inform the value in carrying out further research in this area, and possible benefit to modification of art classroom learning environments.

3.7.3 Follow-Up Visit

After a period of four months, a return visit was made to the schools, to check the above conclusions and observe the implications of the environmental changes on students, teachers and facilities; to assess whether the changes made had been incorporated permanently following the intervention period. This took the form of informal discussions with individual art teachers and school principals and also involved discussions about the importance of constructing a 'best-practice' art classroom environment for students' creativity, to inform further research opportunities.

Chapter Four: Results of pre-intervention study

4.1 Introduction

This chapter describes the initial context development study of relationships between the art classroom environment and students' perceptions of thinking and practices, which included creativity, critical thinking and risk taking in girls' intermediate schools. This gave a broad view of thinking and practices in the art classroom and informed the decision of the focus for the main intervention study. The research was conducted with students attending the autumn semester of years one, two and three in nine intermediate girls' schools during the academic year 2008-2009.

The first section describes the insights obtained from the observations of the students. Students in all three years of intermediate school were observed in a total of nine schools: six public and three private in Jeddah, Saudi Arabian schools.

The second section examines the interviews in which students and art teachers were invited to identify factors that stimulate or inhibit the students' perceptions about their art classroom environments.

Finally, the third section interprets the data obtained from the questionnaires completed by students in the nine selected intermediate girls' schools.

4.2 Field Observations & Behaviour Mapping

In Saudi Arabia, each school at nursery, primary, intermediate and secondary levels usually has its own administrative, teaching and auxiliary staff housed in a different building. During the early stages of the research, 50 intermediate schools in different locations throughout Jeddah, Saudi Arabia were visited and evaluated for their research suitability, based on the selection criteria previously listed. This included both private and public sectors. The aim was to evaluate the current situation in art classrooms and to explore and identify a range of factors with the potential to influence perceptions of thinking and practices.

The next stage of the research involved a search and review of the existing literature. During this early period, students, teachers and the interactions between the two were

observed and described using the techniques of behaviour mapping within the environment of the art classroom. Behavioural mapping is a general means of studying environmental influences on behaviour (Proshansky *et al.*, 1970; Zeisel, 1984). This stage describes and analyses the effects of existing art classroom environments on students' perceptions of creative thinking and practices. It also identifies ways of enhancing these abilities by determining a method of designing an effective art classroom environment in Jeddah, Saudi Arabian schools. In addition, visual analysis will be used to analyse the space within the classroom.

Observational techniques were used to record and map the following factors: classroom size and temperature; the distribution and design of windows; ventilation system; the colour(s) of walls; noise and its sources; floor coverings and materials; natural and artificial lighting; and decor (layout, display materials and furniture). Photographs will be taken without the children in the classroom. These will be used alongside real-life observations.

Table 4.1 identifies the name, type and location of the selected schools in Jeddah, Saudi Arabia.

Table 4. 1: The Name, Type and Location of Schools

School	School name	Type	School code
1st	98th Intermediate Girls' School	Public	98th
2nd	51st Intermediate Girls' School	Public	51st
3rd	65th Intermediate Girls' School	Public	65th
4th	2nd Intermediate Girls' School	Public	2nd
5th	66th Intermediate Girls' School	Public	66th
6th	78th Intermediate Girls' School	Public	78th
7th	Alibdaa Intermediate Girls' School	Private	Alibdaa
8th	Dar Alhanan Intermediate Girls' School	Private	Dar
9th	Anjal Albasateen Intermediate Girls' School	Private	Anjal

4.2.1 Selected Schools

At this stage the visual analysis of the classroom focused on the first step of the basic model for analysis as outlined by Collier (2001). It involved an overview of the classroom as a whole. In the selected schools, the first factor that was discovered was the high number of students in each class, especially in the public schools. The number of students in each class was arguably not compatible with the room size, shape and classroom layout. In addition, there was not really a sense of place ownership so the students could sit wherever they wanted.

In general, the art teachers were responsible for organising classroom factors such as the selection of the curtains and changing wall colours. Most of the classrooms investigated had sufficient lighting supplemented from sunlight as well as non-adjustable white fluorescent light strips. In public schools, two to three window-type air conditioning units would control room temperature as well as some schools having additional fans. Student talking, movement of seats, and the sounds made by the window-type air conditioning units were the most common factors that contributed to noise in some selected schools. The weather in Saudi Arabia may reach over 50 C^o during summer and in some cities during winter, it goes below 0 C^o, which requires the use of air conditioning systems in all public facilities including schools. With the heavy use of these units in the schools, sometimes the students are subjected to these units breaking down during the school day. Unfortunately, due to cultural reasons, maintenance staff (who are always male) are not permitted to enter girls' schools to carry out repairs during the school day; therefore, the classroom temperature is not sufficiently controlled. From my observation, some students directed the air conditioner fans only towards themselves and that may cause health problems for them and make other students in the class feel hot. This could also cause frequent technical problems for these conditioning units. If students are either too hot or too cold, they will find it very difficult to concentrate on their tasks. It will affect their attention on the task. As discussed in chapter 3 the influential book 'DBook' (Fernandez Per *et al*., 2007) considers 64 collective projects in particular focusing on density, data, diagrams and dwellings. In relation to the issue of air conditioning project 57 from Hanoi used 'space block design'. This is an architectural design which alongside the use of louvered openings eliminates the

need for conventional air-conditioning. To tackle some of the problems with air-conditioning units this method may be worth utilising in Saudi Arabian schools.

The flooring materials of the art classroom were also investigated. The flooring of art classrooms was either mosaic or ceramic tiles that can be easily cleaned and are hygienic. However, this type of flooring exaggerates the noise made by seats and table shuffle. A school in Manchester I visited had covered the floor with material that is easy to clean and absorbs the noise. It is also colourful and stimulating for pupils.

Amongst the selected classrooms, only one sink was available in a few of the art classrooms, whereas the presence of more sink(s) will help students to clean their tools and hands. In addition, none of the art classrooms had a first aid kit, which is very important to ensure students' safety. Art related libraries were absent in all of the selected art classrooms, it would have arguably helped students during art sessions by offering new ideas and broadening their thinking.

In all of the selected schools in Jeddah at the end of the art lesson, the teacher presented one or two students' artwork(s) to the class and discussed it with the other students. However, few students responded to the teachers' presentation as the rest of the class were busy completing their own artwork or simply chatting.

The following parts of this section will describe detailed observations in each of the selected schools. This indicates the transition to the second stage of Collier's basic model for visual analysis (2001). Based on the literature review I had an idea about classroom design elements that were worth investigating. Some elements emerged as important during the observations which had not been mentioned in the background research.

4.2.1.1 98th Intermediate Girls' School

The art classroom in this school was located in the playground area. It was approximately 40 square metres in size and consisted of two classrooms, which were opened as one room. The art classroom was used to teach both art and sewing lessons. There were two windows and two doors in the classroom, but only one of the doors was in use; the other had been turned into a display. The doors and

windows were not opened to increase the ventilation owing to hot weather. There were many different colours in the room, including striped blue curtains. The walls were light green and orange in colour. Large plastic seats were arranged around large wooden tables. The cupboards contained a number of sewing textbooks and magazines. In addition, there was a small mobile teaching board that was not sufficient for teacher use. Due to lack of space, the classroom did not contain a teacher's desk. The classroom appeared overcrowded with materials. There were 22–32 students attending each art session. Figure 4.1 is a drawing of the art classroom in this school.

At the beginning of each art lesson, students spent quite a long time seating themselves and they did so in a disorganised manner. In addition, some students could not find a place to sit at the tables; therefore, they moved to the classroom sides rather than sitting at a table. This was due to the large number of students in relation to the room size, shape, and table arrangement, which led to a limitation in accessible classroom space, crowding, students overlapping and an increase in noise. This affected students' communication, interaction and relationships during art sessions. It also affected their ability to listen to the teacher's topic explanation. Therefore, not all of the students were involved in the art topic and the teacher could not assist all students.

In respect to engagement with the topic and asking questions, students can typically be sorted into three categories. First, the fully engaged group, in which a few students, especially those at the front of the classroom, can listen to the teacher's explanations, asking questions, interacting and receiving quick feedback. Second, the partially engaged group, in which the majority of students rarely ask questions or interact and do not listen properly to the teacher's explanations. Third, the non-engaged students, who do not interact or ask questions and do not care about the teacher's explanations; they may spend some time sketching but then take their artwork home where they may receive help from others.

In addition, most of the display and available materials and tools, such as mannequins, were kept in the classroom. The atmosphere of the art classroom in this school was not stimulating students' creative and critical thinking due to the prominence of sewing materials over the artwork. In addition, the display in this

classroom was concentrated at the front while the rest of the classroom walls were bare.

Figure 4. 1: The Art Classroom in 98th Intermediate Girls' School

4.2.1.2 51st Intermediate Girls' School

The art classroom in this school was located on the ground floor of the building. The art room commonly shared intermediate and secondary schools art sessions. It was

approximately 55 square metres in size and filled with art projects. There were two windows, which were not curtained and partially blocked by a cupboard.

The walls of the classroom were painted light green. The classroom itself contained wooden tables for both the students and the teachers. Backed seats were arranged in an L-shape around the tables. The available two tables were placed to two sides of the classroom and were insufficient to accommodate all students due to the large number of students attending the art sessions. More seats were assigned to each table, but this led to crowding around tables and some students moved their chairs to the sides, which may have affected the students' concentration during topic explanation. Students who were able to sit at the tables demonstrated better topic engagement, asked more questions and were able to complete their artwork more easily in comparison to the students sitting to the sides of the classroom. In addition, the teacher was not able to monitor and oversee all students owing to the unfortunate situation where some of the class were sitting and doing their art tasks on the floor. Therefore, it was necessary for her to shout in order to be heard by all class members, which affected the teacher-student relationship. From my observations of the students' body language it was clear that this was read as threatening by students, and discouraging them from being more experimental. They were worried experimentation may have then lead to punishment by the teacher for example, either reducing mark for task or criticism in front of the rest of the class.

The teacher's position while explaining the art topic was in front of the window, which may have also disturbed the concentration of the students due to the strong glare from the sun. The teacher could not physically access all students to help them because of the large number of students and cramped space in the class. The discussion was limited to a few students because of the table layout.

In addition, there were two fixed teaching boards and two bulletin boards on which students' work could be displayed. The display in the classroom was not encouraging some students to be creative due to the lack of their own displayed projects on the classroom's walls. This was mentioned during their in-class conversations with their peers. Others may have benefited by the advantage of viewing the few displayed pieces artwork of higher-level students, which would have exposed them to new ideas. There was also a cupboard containing some

sketchbooks and projects, and a bank of lockers for art and other school-related tools.

There were 24–34 students attending each session. Figure 4.2 is a drawing of this art classroom.
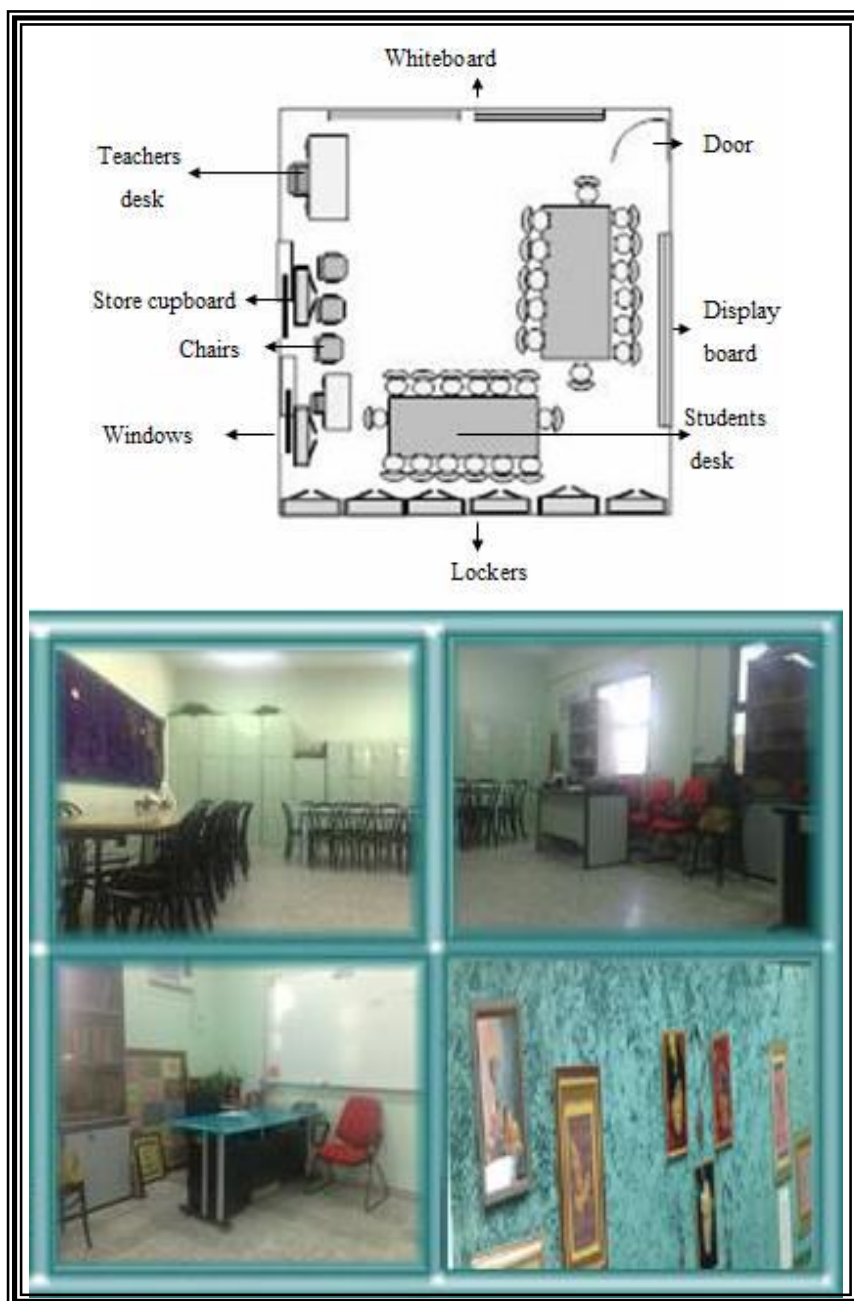
Figure 4. 2: The Art Classroom in 51st Intermediate Girls' School

4.2.1.3 65th Intermediate Girls' School

The art classroom in this school was located on the ground floor in full view of any visitors or new students to the building. It was approximately 55 square metres in size and contained a large student population. There were two windows covered by green curtains and these remained mostly closed due to strong glare from the sun.

The walls of the art classroom were painted light green. Wooden tables had been provided for students and small seats were placed around the tables in a horseshoe arrangement (U-shape). This type of table arrangement made the class seem crowded in comparison to the room and class sizes. Art lessons were usually scheduled for the end of the school day; therefore, students came to the class carrying their school bags with them, which limited student and teacher movement. Seats in this room were rounded and small, which caused discomfort for the students in relation to their body size since ergonomic furniture had not been procured for them. This was particularly difficult as the students spent a long time in the classroom during a 90 minute art lesson. Students were overlapped and some students had difficulty locating a place to sit. Therefore, some sat on the floor or even stood most of the time so they could move freely while performing tasks which were arguably uncomfortable and impacted on their ability to deliver required art tasks in the classroom.

As soon as the teacher finished the topic explanation and returned to her desk, many students needed to approach her to ask questions or receive individual feedback, which led to more crowding and noise. This also reduced the opportunity for other students to obtain the benefit of discussing the work of other students. In addition, I noticed in different sessions that a number of the students who sat at the back of the classroom were performing their task in a creative manner and trying many things while others did not complete their task and just did some sketches, which led to teacher punishment, either reduced student marks or a telling off, in turn sometimes impacting on the teacher's mood.

A large and cluttered teacher's desk stood in one corner of the room. There was also a cupboard containing sketchbooks and projects, and a bank of lockers holding some art materials and tools. In addition, there were two fixed teaching boards, one of which was used by the teacher; the other contained a display of simple drawing

projects. The two bulletin boards that were supposed to display student work were empty.

Students chatted loudly, which affected their ability to engage with the topic and complete their work or even complete some sketches to show that they are working and intended to finish the task at home. The crowding, overlapping and excessive noise by students affected their ability to listen to the teacher's explanations. Therefore, they missed information that could have helped them to do their tasks in a creative manner. 32–38 students attended each session. Figure 4.3 shows the layout of the art classroom in this school.
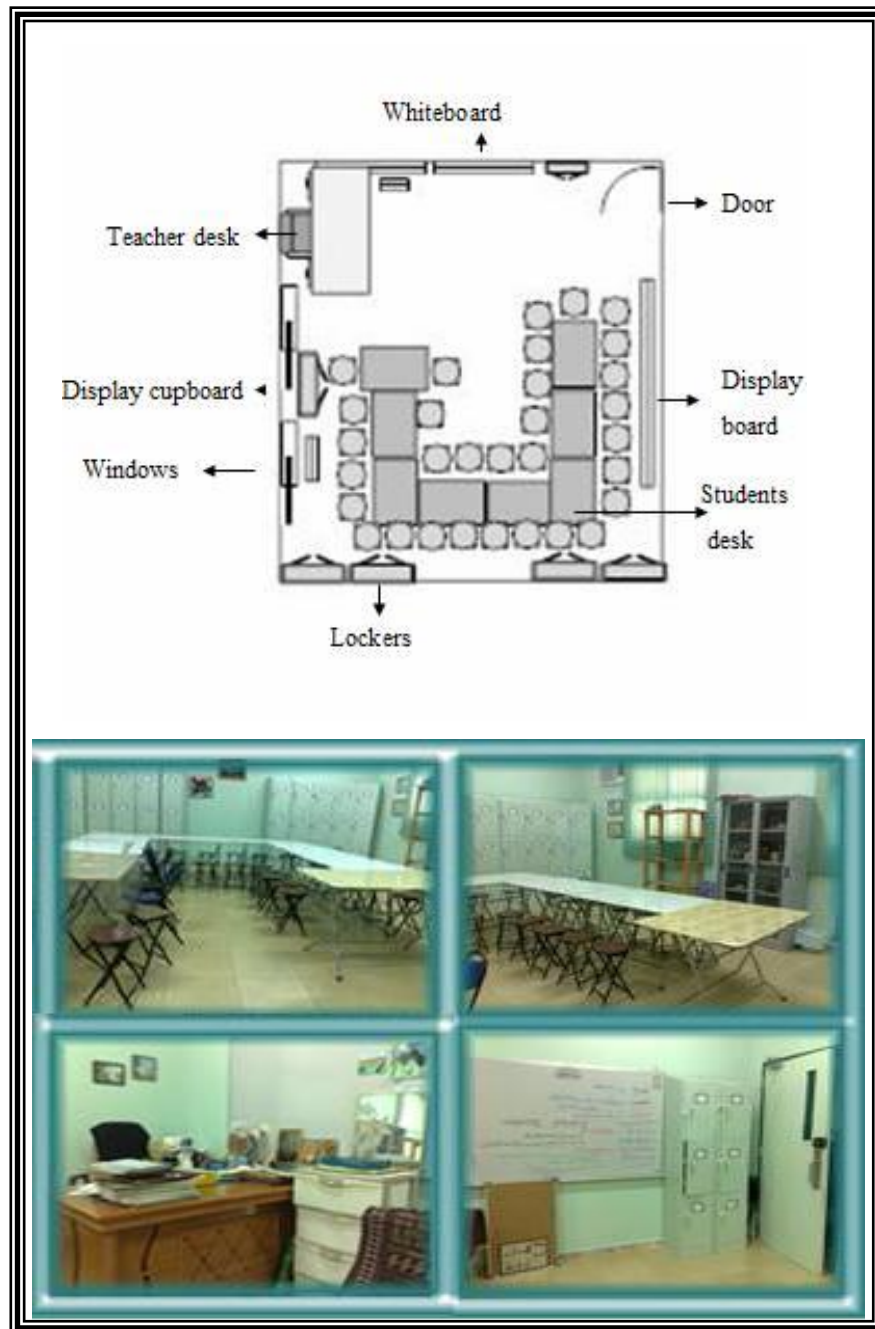
Figure 4. 3: The Art Classroom in 65th Intermediate Girls' School

4.2.1.4 2nd Intermediate Girls' School

The art classroom in this school was located on the first floor of the building. The room hosted both intermediate and secondary level art sessions, at separate times. Three teachers shared the art classroom. It was approximately 55 square metres in size. There were two windows which were covered by green curtains but remained closed most of the time because of the strong sunlight that shone through them.

The walls of the art classroom were painted light green. Four wooden tables formed two pairs that had been placed in two opposing horizontal rows and small seats were arranged around the tables. Seating at tables were limited in comparison to the number of students; therefore, overlapping occurred and some students occupied the floor to complete their art tasks, which limited the discussion between students and affected movement in the classroom. The available tables were quite high and not suitable for some students' size and height; therefore, some students stood in order to use the tables.

There was a cupboard containing some sketchbooks and projects, and a bank of lockers containing some art tools related to secondary school. In addition, there were two fixed teaching boards and two empty bulletin boards, their purpose should have been the display of students' work. However, there was no display because the teachers could not agree on what to display. The atmosphere of the art classroom in this school suggested potential for boredom due to a lack of displayed projects on the classroom's walls, which would not stimulate students' creative and critical thinking.

Students could not listen properly to the teacher's explanation because of crowding, noise by other students and frequent interruptions by secondary school teachers during the lesson. In addition, it was observed that the art teacher in this school was involved and performing the same task as the students. In this practice she was observed to make mistakes, such as poor choice of colour then deciding it to be inappropriate, with an 'oops', to then mix different colours. This then motivated the students to try new things because they saw their teacher doing so. This may be an interesting area for further research. 36–40 students attended each session. Figure 4.4 is an illustration of the art classroom in this school.
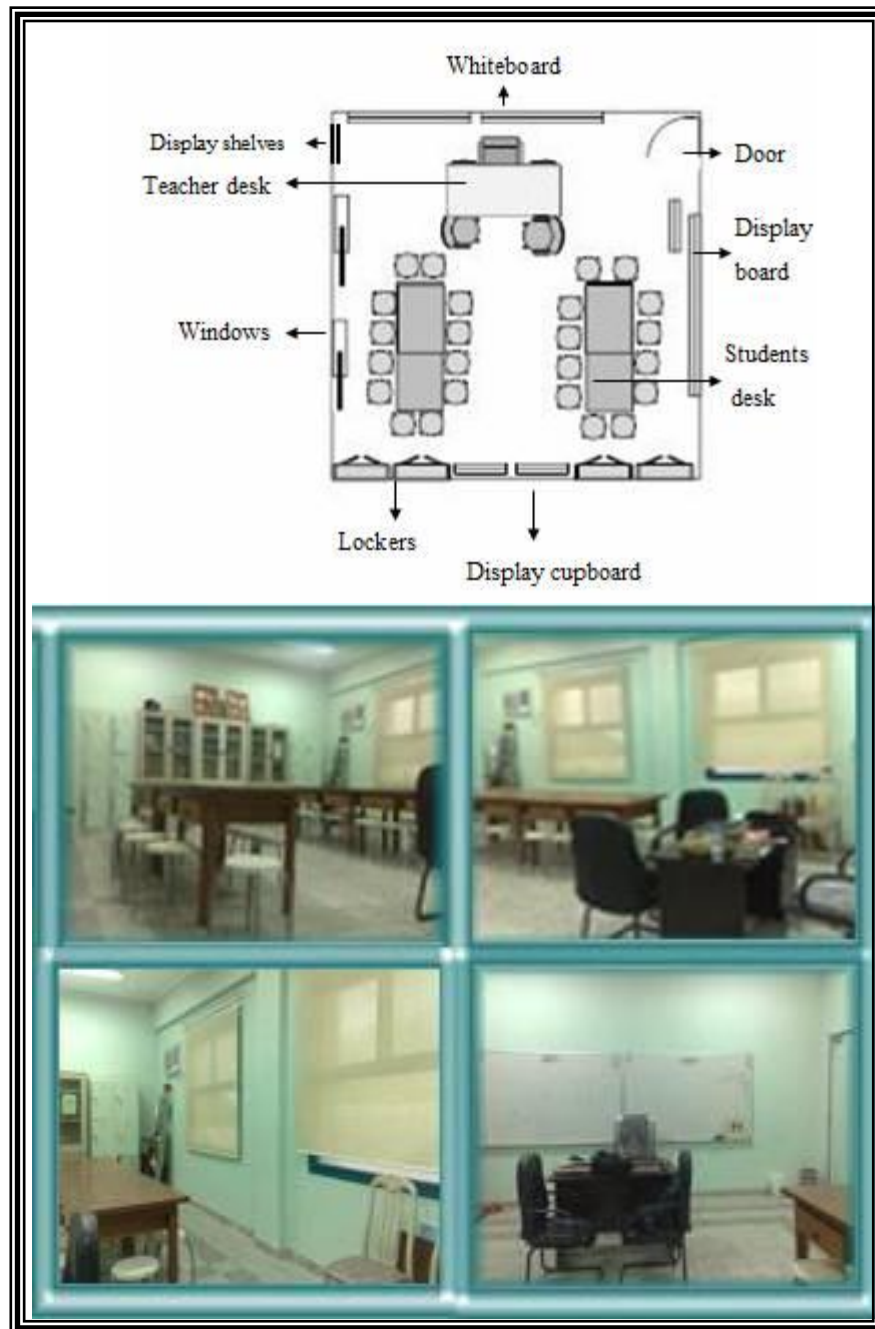
Figure 4. 4: The Art Classroom in 2nd Intermediate Girls' School

4.2.1.5 66th Intermediate Girls' School

The art classroom in this school was located on the first floor of the building. It was approximately 48 square metres in size and had been fitted with three window-type air conditioning units. There was one large window covered by light pink fabric curtains and the room was extremely bright during investigative visits.

The walls were painted light pink. The wooden tables and backed seats had been arranged into a U-shape. The classroom was crowded due to large student numbers, 36–40 students attended each session, in relation to the classroom size, which caused movement limitations and an exaggeration of noise. The discussion was restricted to two or three students owing to the table layout. It appeared as though students in the middle table felt awkward as I observed students having to constantly turn in order to listen to the teacher before turning back to continue with their task. Some students repeated questions and some could not complete their work during the session because of crowding, overlapping and noise. The teacher sat at her desk owing to limited movement space. The students had to go to her desk to receive her feedback, and the restricted movement made the benefits of the teacher's feedback seem to lose value. In addition, not all students engaged in the topic, which reduced their chance to practice critical thinking and creativity owing to a lack of individual feedback.

There was a cupboard containing some sketchbooks and projects, and a storage facility holding some art tools. In addition to a fixed teaching board, there was also a bulletin board displaying a messy and unclear exhibition of the work of previous years' students. This exhibition was on the walls and on the top of the side bench in a crowded manner, which may have confused students rather than leading to stimulation and ideas. It was collecting dust that was possibly influencing students' health and arguably negatively influencing the students' view of the importance of the artwork they were generating. Furthermore, the placement of a lot of artwork on the floor restricted access to the sink, which affected the movement of the teacher and students during lessons. Figure 4.5 shows the arrangement of the art classroom in this school.
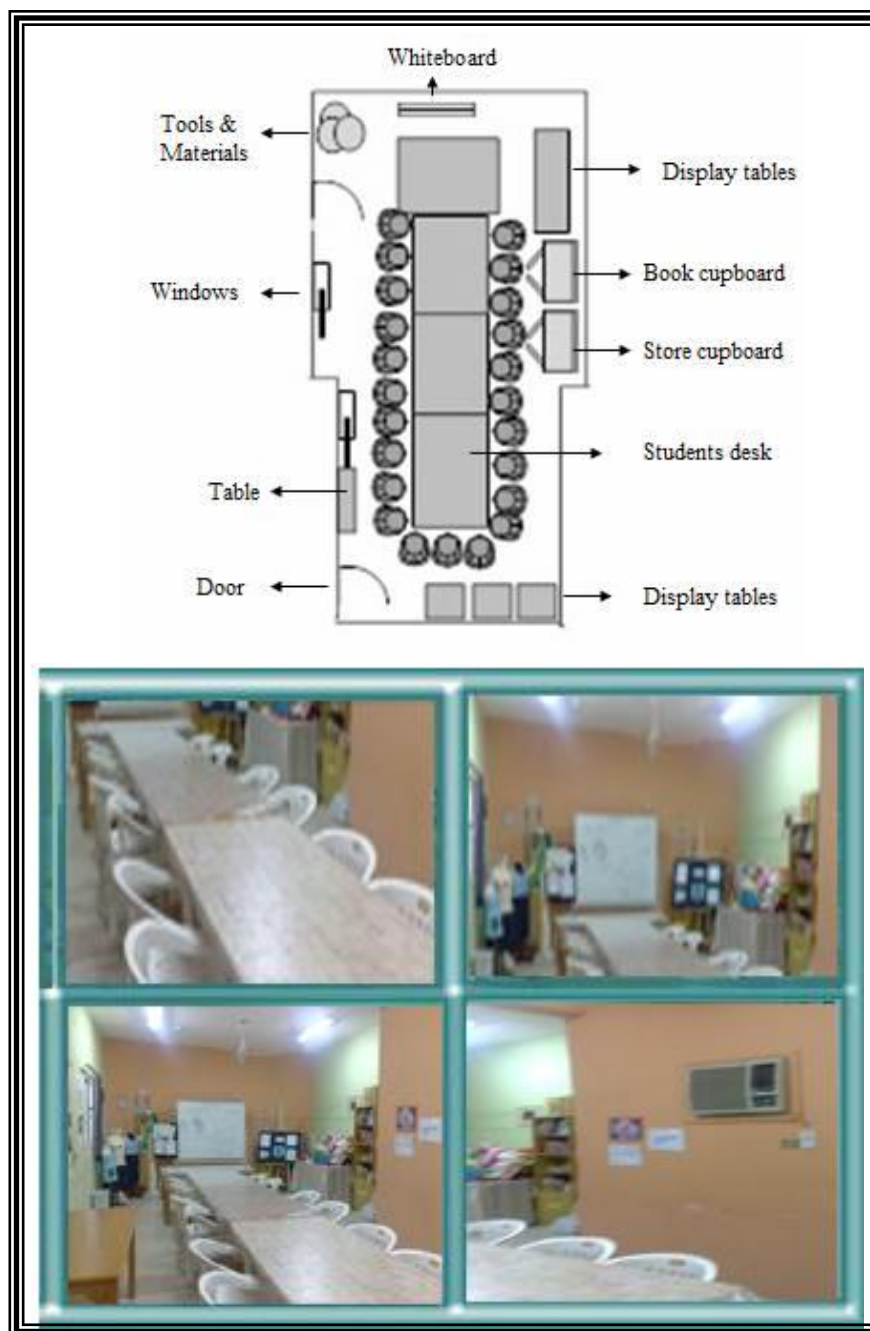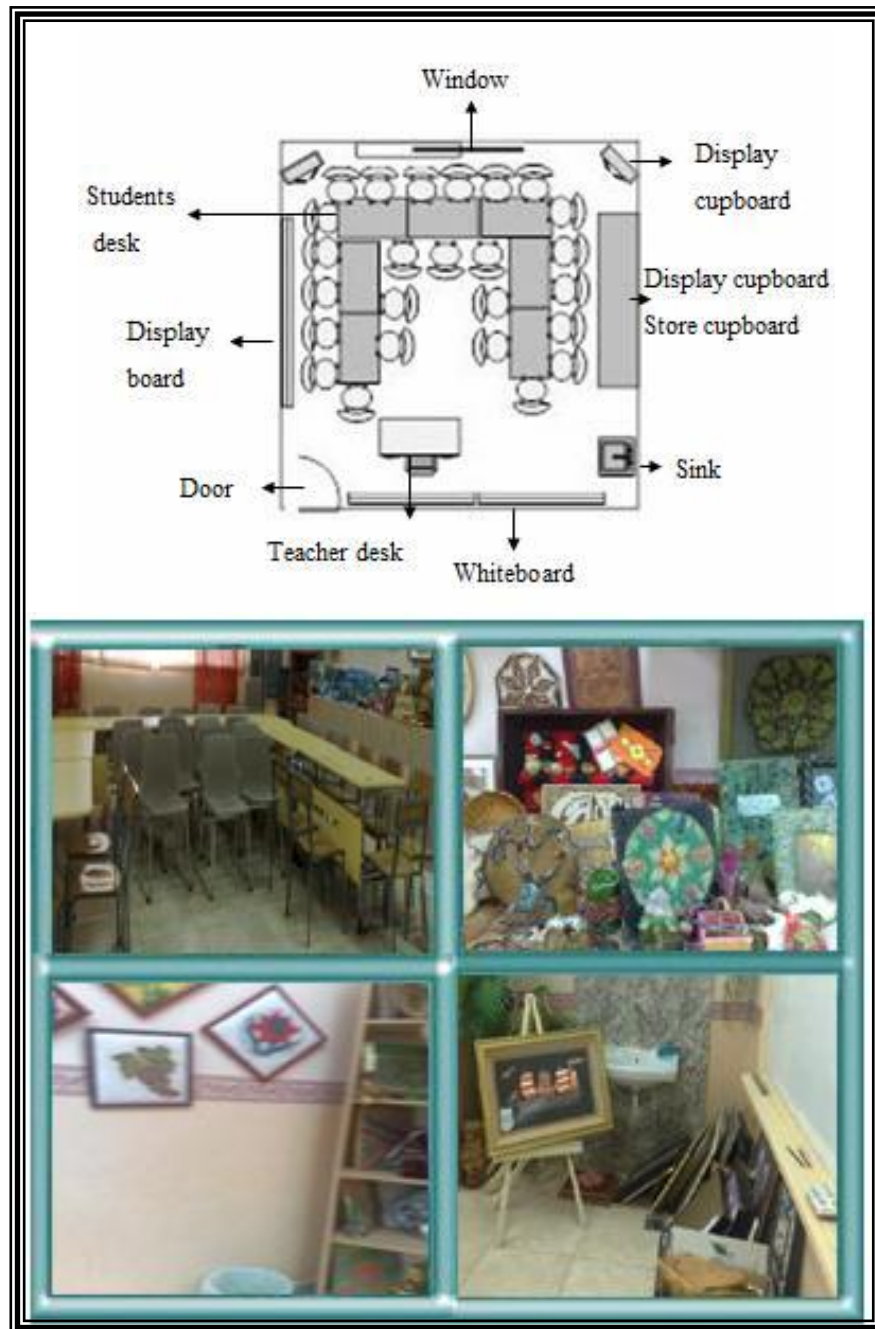
Figure 4. 5: The Art Classroom in 66th Intermediate Girls' School

4.2.1.6 78th Intermediate Girls' School

The art classroom in this school was located on the ground floor in full view of any visitors or new students to the building. It was approximately 55 square metres in size and held a large population of 29–39 students per session. There were two windows covered by green curtains but remained mostly closed due to the strong sunlight.

The classroom walls were yellow in colour with red flowers. Four large wooden tables had been arranged in a group for students and plastic chairs were placed around them. At the beginning of each art lesson, students were able to sit in their places easily around the tables because they were arranged in a group. However, the room was still busy because the number of students was higher than the classroom size could comfortably accommodate. Nevertheless, communication between students themselves as well as with the teacher was good; students were engaged in the art topic and the teacher could help students and moved easily around the tables.

A large and cluttered teacher's desk was located in one corner of the room. There was a cupboard containing some sketchbooks and projects, and a bank of lockers for the storage of art materials and tools. There were two fixed teaching boards.

There were two bulletin boards with some displayed instruction materials written in small text. This may have reflected to the students that it was a serious working environment, which was not encouraging students to take risks. There was very little artwork displayed in this art classroom in comparison to the available projects that were placed on the edge of the floor. Figure 4.6 is a blueprint of the art classroom in the 78th Intermediate Girls' School.
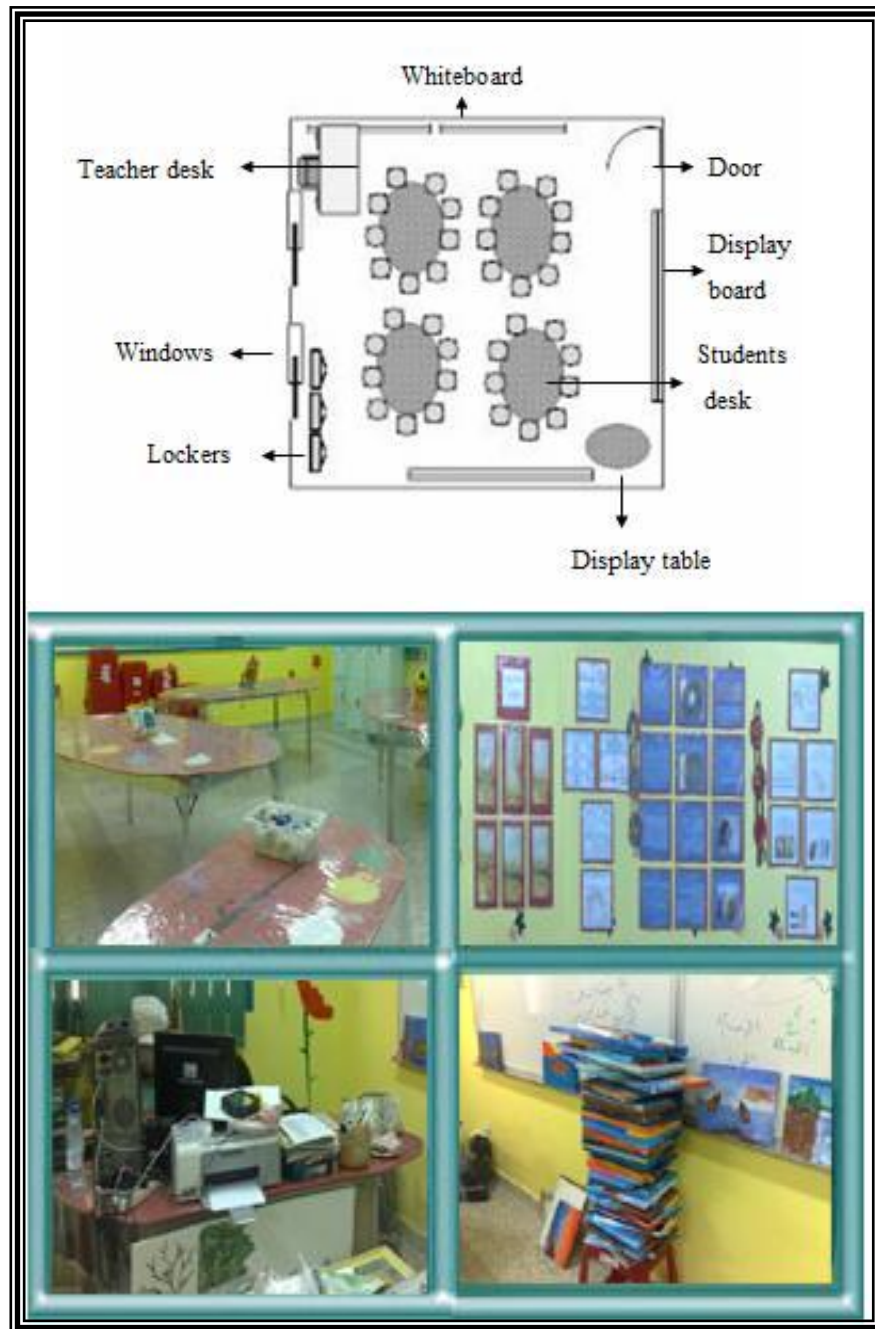
Figure 4. 6: The Art Classroom in 78th Intermediate Girls' School

4.2.1.7 Alibdaa Intermediate Private Girls' School

The art classroom in this school was located on the ground floor of the building. It was approximately 35 square metres in size and had been fitted with two split-unit air conditioners and two large windows, enabling temperature regulation and proper ventilation. Green curtains covered two windows and the curtains stayed mostly open.

The classroom walls were painted white. There were limited information resources available to students and no displayed artwork. This absence of visual stimulation for students was bleak and caused the art classroom to lose identity. There was an empty bulletin board, which should have been used to display students' work. This lack of stimulation could have resulted in the students being uninspired and lacking motivation.

Hardwearing ceramic tables were arranged in a U-shape and surrounded on the edges by backed seats. Classroom capacity was planned for and the number of students who attended each session reflected this. The class was calm with easy access for both students and teacher and this enabled the teacher to assist all students when necessary. As the tables were fixed permanently to the floor the arrangement was an unchangeable U-shape. This potentially limited interaction and dialogue between students as only two to three students could engage effectively with each other. Students could listen to the teacher's explanation due to the classroom's quiet condition and students were able to complete their work.

The teacher's desk was in the middle of the room and there was a cupboard containing sketchbooks and projects as well as two storage units containing art materials and tools. In addition, a fixed teaching board also served as a projector screen and there was a sink in which students could wash their hands and tools. Each session was attended by 13–20 students; this low figure is arguably the reason that this classroom was generally quiet and calm. Figure 4.7 shows the design of the art classroom in Alibdaa Intermediate Private Girls' School.

Figure 4. 7: The Art Classroom in Alibdaa Intermediate Girls' School

4.2.1.8 Dar Alhanan Intermediate Private Girls' School

The art classroom in this school was located in the basement. The room was approximately 30 square metres in size and housed a small store for art tools and materials. There were three doors in the room: a main door, a store door and a fire door. A split-unit air conditioner had been installed but the room was poorly ventilated because the main door opened onto the corridor, and the height of the

window prevented students from opening it. The main source of lighting came from non-adjustable white fluorescent light strips.

The walls of the art classroom were painted white. Wooden tables were arranged in an L shape and there was one table in the centre of the room. The number of students exceeded classroom capacity as only four students sat at the central table and the remaining students sat scattered at the side tables. This affected interaction, dialogue and discussion between students and limited group engagement to only two or three students during the art task. The class was calm; therefore, students could listen to the teacher. Different illustration tools were used during the lesson and the teacher was able to assist all students. The students in this school could complete their work and then they could leave their artwork in the art classroom owing to the storage area. This highlighted the importance of a separate storage facility for students to leave wet and/or uncompleted work.

Students' had a supportive relationship with their teacher. This was achieved by allowing students to make mistakes and encouraging them to try new things. Therefore, the students appeared to feel safe. From my observations this friendly atmosphere enabled them to try new things as they exhibited acceptance. The teacher presented and hung all students' work on the walls in the following session, even if it was not of a perceived high quality. When the students entered the classroom at the beginning of each lesson, they stood for a short time in front of their artwork that was hung on the wall. Their feelings of pride generated by being publically associated with their work in class encouraged them to perform better next time. It also led to discussion, exchanging of ideas, and criticism between students about their work.

The room featured a cupboard containing some paint, which had been installed above a sink. In addition, there was a small fixed teaching board and two bulletin boards displaying some student work. The usual class size was 15–19 students, but the art teacher coordinated with the sewing teacher and school administration to divide the class into two groups of 7–15 students attending each session to overcome the small size of the art classroom and to have more control of the students. This increased the teaching load but is a very applicable strategy in small schools where teachers generally have a smaller teaching schedule. In bigger schools, this kind of strategy

and schedule adjustment requires more staff. Figure 4.8 shows the layout of the art classroom in this school.
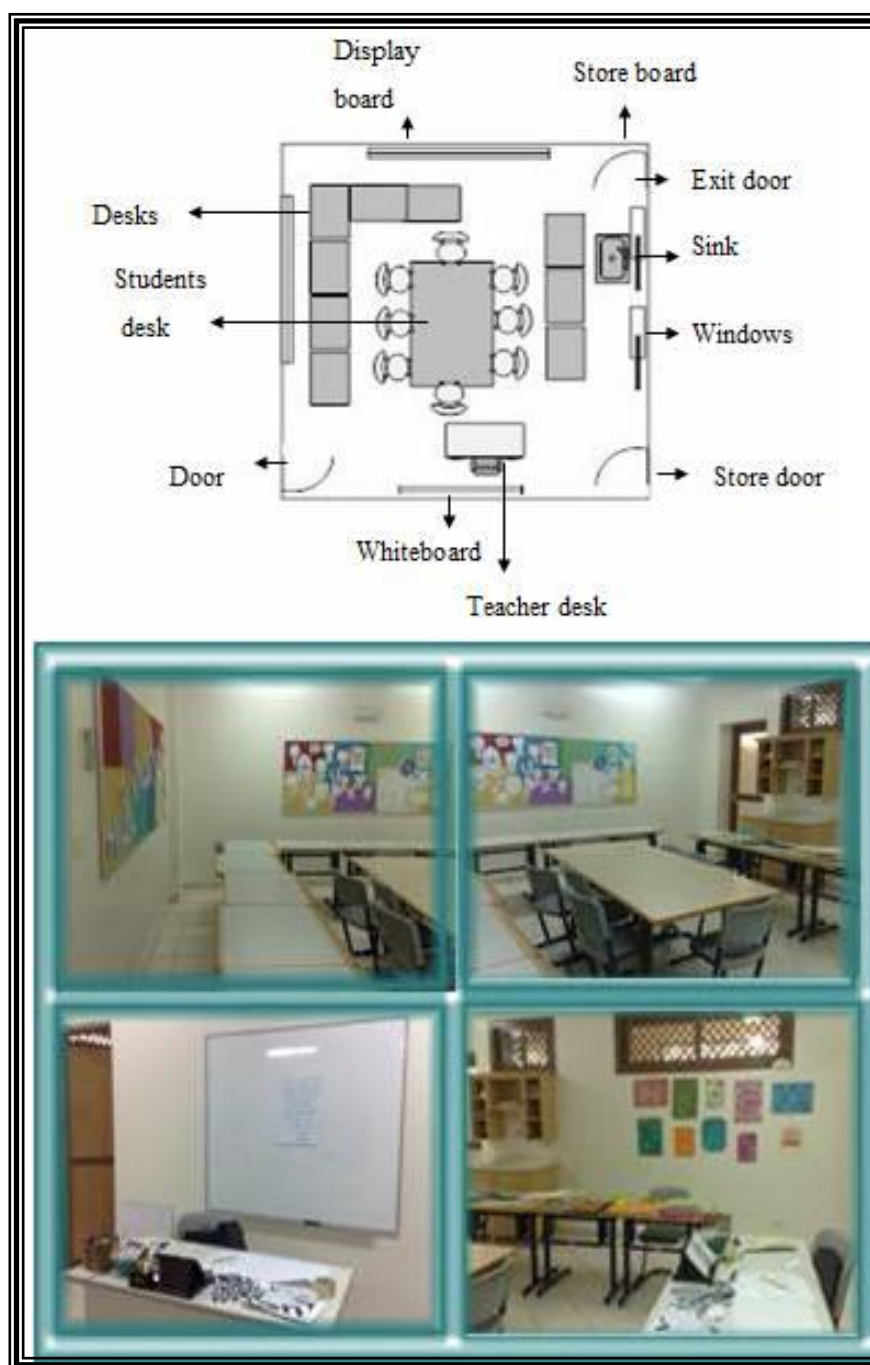
Figure 4. 8: The Art Classroom in Dar Alhanan Intermediate Girls' School

4.2.1.9 Anjal Albasateen Intermediate Private Girls' School

The art classroom in this school was located on the first floor of the building. It was approximately 58 square metres in size and featured a large, curtained window

directly overlooking the street. It possessed a suitable room temperature owing to the use of one split-unit air conditioner.

The walls of the classroom had been painted dark yellow and the display of artwork was limited to one wall. There was a fixed teaching board and wooden tables, around one side of which wooden and metal chairs had been irregularly distributed. The number of students in this class was small whilst the size of the classroom was large. It accommodated all students with plenty of free space but without the effective utilisation of this space. The arrangement of the tables limited student interaction, dialogue and discussions owing to the disorganised distribution of chairs, which caused students to be scattered around the classroom. The class was calm, which enabled the teacher to present the lesson explanation effectively; the teacher used different teaching tools and was able to assist all her students. Noise in this school was exaggerated by passing traffic and the movements of seats on the floor. Each session was attended by 8–15 students. Figure 4.9 shows the layout of the art classroom.

Figure 4. 9: The Art Classroom in Anjal Albasateen Intermediate Girls' School

4.2.1.10. Overview of Observations

As discussed in section 4.2, field observations and behaviour mapping identified some broad factors across all of the selected schools in the cohort. These include; location, whereby there was no standard positioning of art classrooms in schools; utilisation, where the classroom was often shared between different groups or subject types; room structure and design, as most classrooms had not been designed for art

use; furniture, where the equipment was of varying types and often not ergonomically suitable for the students; movement, which was often difficult within the room for both teacher and student; noise levels, which made effective teaching more difficult; student numbers, which were high in public schools; and lastly, display space which was used at varying proficiency levels. Some of these factors and their potential influence upon utilisation were not obvious to staff and students. Behaviour mapping has contributed to this understanding of factors influencing student risk-taking for creative and critical thinking through observation of the students in context i.e. within the actual classroom. By categorising the observed behaviour, and analysing the data gathered, it is possible to gain a greater understanding of the links between the environment and student behaviour.

4.3 Interviews

The interviews used a qualitative approach to investigate experience of classroom environments, with the purpose of identifying a range of factors with potential to influence perceptions of thinking and practices. Open-ended questions were asked of a teacher and a student. In addition, personal interviews were conducted with teachers when students were not present. These took place in different areas of the school, such as the teacher's office and the art classroom itself. Interviews were conducted with students in different sites within the schools, such as regular classrooms and art classrooms. As most of the points covered by the art teacher and student interviews generated data that had similarities, the data was analysed qualitatively to avoid repetition, which I summarise below.

4.3.1 Teacher Interviews

The following is a list of the questions covered in the interviews, along with a summary of the data obtained through interviews with the art teachers (Appendix 6).

1. What do risk-taking, creative thinking, and critical thinking mean?

Art teachers pointed out that risk-taking is an act that involves trying new things, with non-predictable results. In addition it was noted that 'personality type can affect students' willingness to take risks'. Creativity is doing something new, such as developing an existing idea and realising it through a creative project. One teacher

2nd school stated that 'creativity can be as simple as adding something new to an existing idea'. Critical thinking is important in art as a subject, because it enables students to analyze, evaluate, explain, and restructure their thinking. Some teachers verified that they had to 'use critical thinking carefully as this can be a sensitive area which may upset some students'.

2. *How do you encourage students to take risks and try new things in art lessons?*

Within the constraints imposed by some of the schools' facilities, art teachers in selected schools mentioned that students are encouraged to take risks and try new things through the use of different teaching tools; such as using technology during art sessions; as well as communication in order to facilitate a good relationship between teacher and students to build up students' confidence. In addition, they said that doing some art tasks in different parts of the school such as a playground area would promote new ideas owing to the different learning environment. Visiting other places such as art galleries or museums, would introduce students to a diverse range of different artists' ideas and techniques. In addition, teachers using encouraging words and phrases along the lines of 'excellent, keep going' will facilitate risk-taking behaviour because it develops confidence on the part of the students. Some teachers felt that students were more creative when sitting with their friends. Whereas other teachers disagreed and believed that students would chat and be distracted when close to friends, so there were varying experiences in terms of student relationships.

3. *What is the main factor in the art classroom environment that may inhibit students from taking risks and trying new things?*

The main factors that may inhibit students from taking risks and trying new things in the opinion of the art teachers' were discomfort from volume of noise, limitation of space in the art classroom and the large number of students in each session making it difficult to work on ideas that required more space to work. This is a point of concern for art teachers in some schools, because it can influence the mood of the class, for example one teacher reported 'when I tell them off they get upset and don't even want to continue with the work'.

4. What are the main aspects of the art classroom environment that may encourage students to take risks and try new things in their work?

The type and size of furniture; the colourful display, the general layout, and the presence of a sink, especially in painting tasks were the factors discussed by the art teachers as most pertinent to this question. One teacher in 98th school wasn't concerned about a sink being in the art classroom as they stated that 'the students play around with the water'. This suggests that there are different opinions held by teachers about the provision of facilities for art lessons, particularly sinks.

5. Do you think that the art curriculum encourages students' creativity and motivates them to try new things?

Concerning the art curriculum, Art teachers pointed out that some topics are suitable for students while other topics are not; due to the lack of space; the large number of students; and deficiencies in some tools and facilities. For example, when students use aerosol spray they are noted to be more creative, but classes are often restricted by classroom size in the use of aerosols, so the teachers try to use different materials and tools instead when they have smaller rooms. The aim is to appropriately facilitate students in their creative practice, within the classroom area.

6. What are the most important facilities that you need in your art classroom to encourage students to take more risks and to try new things?

With respect to the question of the most important facilities that art teachers need in their art classroom to encourage students to take risks and to try new things, teachers suggested that this would be the space to accommodate increased storage and other facilities and equipment to try new things and enhance students' risk-taking and to be more creative. The art teachers focused on some missing facilities in the art classroom including; sinks, a personal computer (PC) section, appropriate furniture, such as adjustable art desks; and a classroom large enough to accommodate the number of students.

7. Are there any other issues or problems with your classroom, or any information that you would like to give?

Public schools' teachers pointed out that they needed to have more space to accommodate the large number of students. Some teachers focused on the fact that the classroom should be assigned only for art sessions and not shared by other teachers for other subjects or even for other grade-levels i.e. secondary school students.

4.3.2 Student Interviews

Interviews (Appendix 7) were carried out with students about the classroom environment to identify factors that stimulate or inhibit risk-taking for creative and critical thinking.

The responses of the students' interview questions that cover different topics are summarised as follows:

1. Describe your art classroom generally.

The students were concerned with the fact that their art classroom is 'noisy', 'busy' and 'crowded' due to the large number of students and poor layout within a small classroom. This arguably reflected most that students were unsatisfied with their art classroom. Their responses referred to the existing situation of art classroom environments.

2. What is creative thinking?

The majority of the students defined creative thinking as the ability to think creatively about doing things in ways that they might not have thought of previously. For example, 'I can't believe I created that!' A few commented that they could get different results using other student's tools.

3. What is critical thinking?

Some students said that critical thinking is 'based on peer feedback'. 'Why have you chosen this colour? Terrible! Perfect!' This use of extreme words as mentioned in the contextual review is a characteristic of adolescence and shows an example of critical thinking. They saw critical thinking as giving opinion rather than questioning.

4. What is risk-taking?

Students defined it as trying new things without knowing how they will turn out. For example, 'adventure' and other students said 'being brave' or 'sad/happy outcome'. The interesting point one student said about risk-taking is that it might involve 'not following the teacher's instruction exactly'.

5. What is the best thing you do in the art classroom?

Students' answers showed that the best thing they undertook in the art classroom was 'chatting with peers about the topic' during art lessons. For example, 'I can chat with my friend', whereas in Maths the teacher talks and the students listen.

6. What is the main thing in the art classroom environment that inhibits you from taking risks and trying out new things?

Students pointed out that lack of space, a crowded art classroom, and deficiency of tools and materials contributed to inhibiting their wish to trying new things. For example, 'I can't find my stuff as this classroom is too full' and 'I like to complete my work at home as I can't find a space to sit in my classroom'. 'At home I can sit on the floor and spread my materials out'.

7. What are the main aspects of the art classroom environment that encourage you to take risks and try new things?

Students suggested that teacher engagement and teamwork; the freedom to discuss tasks among themselves; and an atmosphere of friendliness in which students are not afraid of the teacher were an important factor in the art classroom environment that can encourage students to try new things to be more creative. In addition, the appearance in general of the art classroom and the display within it was one of the points mentioned by the Jeddah students, because the art classrooms resembled the appearance of any other academic classroom. There were no displays on the walls, and students found them uninspiring.

8. What are the most important facilities that you need in your art classroom to encourage you to take risks and try new things?

Students talked about the presence of more tools, materials, PCs, sinks and suitable furniture.

9. Are there any other issues or problems with your classroom, or any information that you would like to give?

Students wanted the art subject to be optional because not everybody likes art lessons as each individual may have difference levels of confidence with different subjects, preferring subjects they are more confident with. Then students could choose to take a subject that they enjoy from the elective subjects of sewing, economics, and art.

4.3.3 Overview of Interviews

The interview process contributed to the understanding of significant factors within the art classroom environment, identified by teachers and students, which could enhance student risk-taking for creative and critical thinking. Some of the factors were identified by only one of the groups e.g. students said that chatting about the topic in class was beneficial but teachers did not mention this in their interviews. On the other hand, areas of agreement were factors that were identified by both teachers and students as having an influence on student thinking and their art practices e.g. developing a good relationship between both parties to facilitate communication amongst other things or having more space in the classroom to try new things. Some factors noted by interviews such as layout were not already known to staff and students. By capturing this data I was better able to understand my participants and the way in which they viewed factors that I, and they, had acknowledged.

4.4 Students' Questionnaire

From information based on the contextual review as well as data gathered from schools' observations and interviews, the final questionnaire was formulated. It was originally formulated in English, and then translated into Arabic, the Saudi Arabian students' mother tongue, before being administered to them

The questionnaire covered different factors of the art classroom environment, and their influences on students' creativity and ability to try new things.

I introduced myself to each class on their first meeting and attended at least four of their art sessions, during which the students performed different activities such as drawing, painting and completing projects. The questionnaire was then distributed to them without the presence of their art teachers, so that they would be able to answer it freely. I was available to clarify any issues that arose in relation to the questionnaire.

Questionnaires were distributed to 100 randomly selected students, using a random number table, for each school level in the nine surveyed schools in Jeddah. Nine hundred questionnaires were distributed, and 755 were completed and returned.

Twenty-two questions were presented. All participants answered the first twenty-one questions which were compulsory, but some did not answer question twenty-two because it was open-ended and optional.

In order to analyse and understand student responses, each question was considered in turn.

1. ☐ *I am interested in art.*   ☐ *I am not interested in art.*

The first question asked whether students were interested in art. Table 4.2 identifies the findings for this question across all nine schools. Total numbers are summarised in Figure 4.10, while the responses given by each of the nine schools are represented in Figure 4.11.

Table 4. 2: Students' Interest in Art

School	Students' interest in art			
	Yes	(%)	No	(%)
98th	75	75.0	25	25.0
51st	81	81.8	18	18.2
65th	46	48.4	49	51.6
2nd	50	50.0	50	50.0
66th	74	74.0	26	26.0
78th	55	62.5	33	37.5
Alibdaa	41	82.0	9	18.0
Dar	79	84.9	14	15.1
Anjal	26	86.7	4	13.3
Total	527	69.8	228	30.2
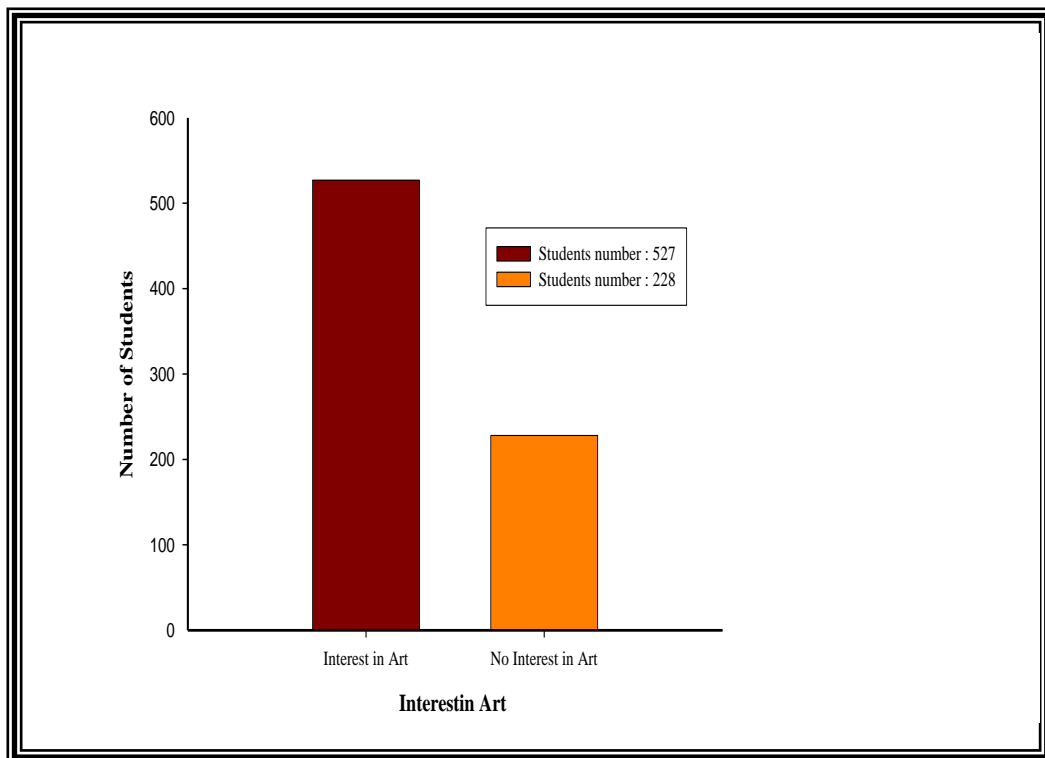
Figure 4. 10: Overall Interest or Not Interest in Art
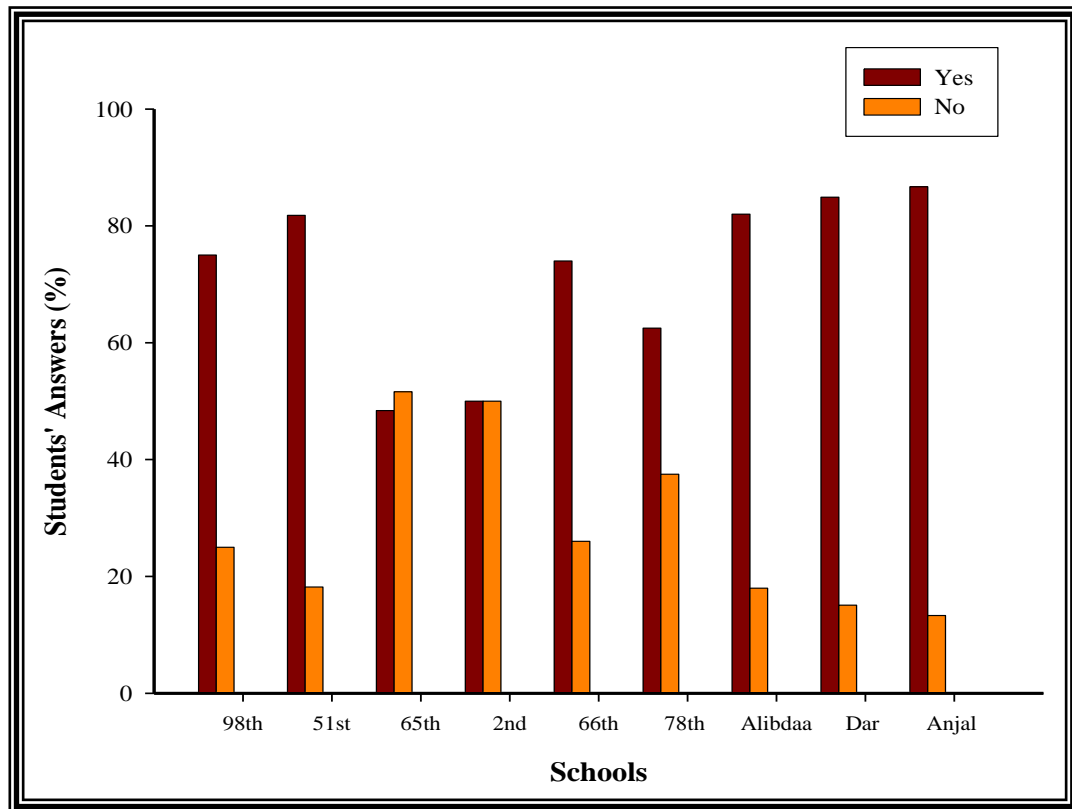
Figure 4. 11: Individual Schools' Interest in Art

Overall, the student responses were high for the statement 'I am interested in art' (69.8%) while conversely 'I am not interested in art' was much lower (30.2%). The majority of students (69.8%) were interested in art. Each private school scored more highly than any of the public schools for the response: 'I am interested in art' (82%). This is possibly owing to the fact that facilities were specific, budget was higher and student to teacher ratio was lower in a private school.

Questions 2 to 21 were Likert-type questions, asking respondents to indicate the extent to which they agreed with each of the statements on a five-point scale, which was scored as follows:

Assessment	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Score	4	3	2	1	0

Question 2 concerned classroom preferences. Do the students prefer working in an art classroom rather than a general classroom?

2. I prefer to take art sessions in our art classroom.

Table 4.3 identifies students' classroom preferences. Overall numbers are summarised in Figure 4.12, while the responses of individual schools are shown in Figure 4.13.

Table 4. 3: Students' Preferences for the Art Classroom

School	Strongly agree		Agree		Neither agree nor disagree		Disagree		Strongly disagree		Total	
	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)
98th	44	44.0	9	9.0	29	29.0	6	6.0	12	12.0	100	100
51st	67	67.7	13	13.1	14	14.1	5	5.1	0	0.0	99	100
65th	53	55.8	13	13.7	21	22.1	5	5.3	3	3.2	95	100
2nd	43	43.0	9	9.0	29	29.0	4	4.0	15	15.0	100	100
66th	79	79.0	8	8.0	9	9.0	2	2.0	2	2.0	100	100
78th	58	65.9	17	19.3	10	11.4	1	1.1	2	2.3	88	100
Alibdaa	41	82.0	5	10.0	3	6.0	0	0.0	1	2.0	50	100
Dar	51	54.8	26	28.0	10	10.8	2	2.2	4	4.3	93	100
Anjal	19	63.3	3	10.0	8	26.7	0	0.0	0	0.0	30	100
Total	455	60.3	103	13.6	133	17.6	25	3.3	39	5.2	755	100
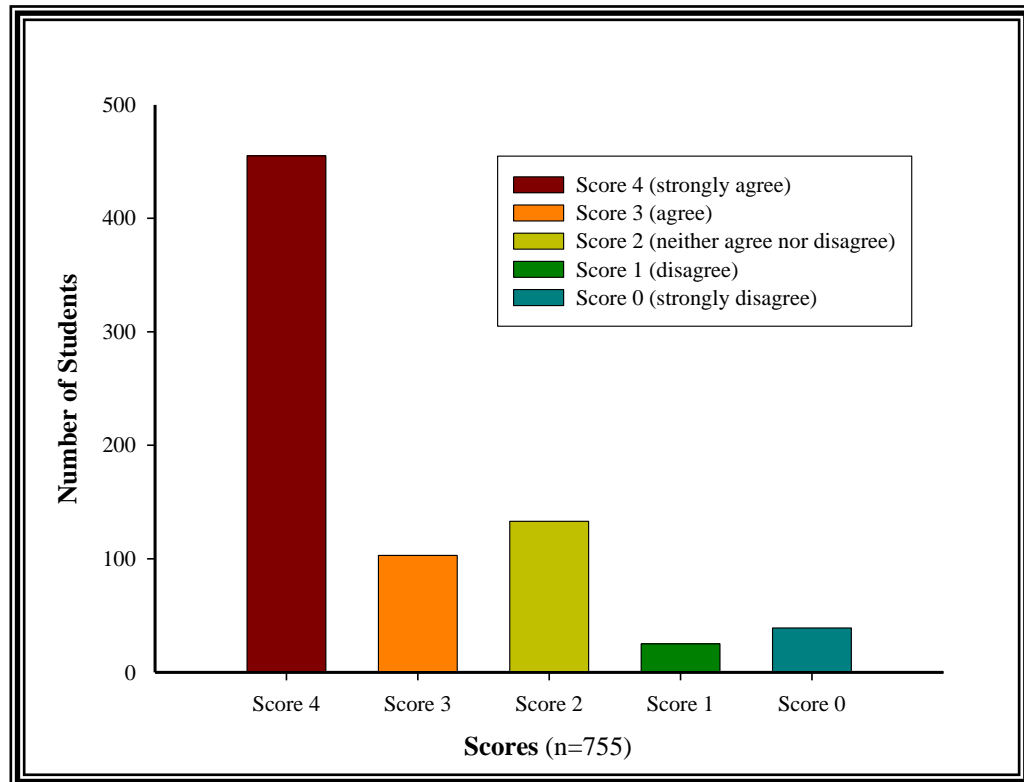
Figure 4. 12: Overall Preferences for the Art Classroom
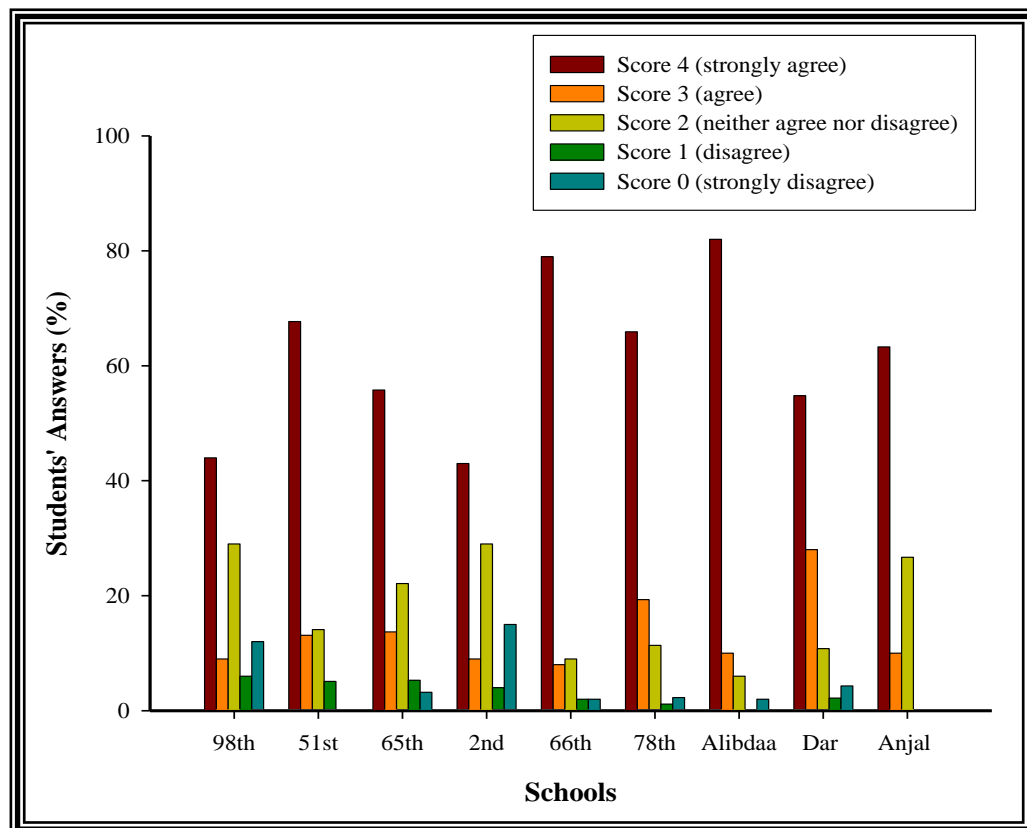
Figure 4. 13: Individual Schools' Preferences for the Art Classroom

Despite the shortages in some elements of an art classroom environment in comparison to a general classroom, the majority of students (60.3%) still strongly preferred to take art sessions in their art classroom. The students' responses to this question also revealed that two public intermediate girls' schools 98th and 2nd recorded the highest score of 'strongly disagreed' (12%), and (15%) respectively. This is possibly owing to the fact that the art classroom in 98th school was shared between two teachers in different subjects while the art classroom of the 2nd school was shared between three teachers in different grade-levels i.e. in this case secondary and intermediate classes sharing the space.

The third statement explored students' assessment of the ventilation in their art classroom.

3. The ventilation in our art classroom creates a good environment for creativity and trying new things.

Table 4.4 summarises students' assessment of the ventilation of their art classroom in relation to creativity and trying new things. The responses to this question are represented in Figures 4.14 and 4.15.

Table 4. 4: Students' Assessment of the Ventilation in their Art Classrooms

School	Strongly agree		Agree		Neither agree nor disagree		Disagree		Strongly disagree		Total	
	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)
98th	5	5.0	20	20.0	29	29.0	33	33.0	13	13.0	100	100
51st	21	21.2	24	24.2	35	35.4	11	11.1	8	8.1	99	100
65th	29	30.5	23	24.2	28	29.5	10	10.5	5	5.3	95	100
2nd	51	51.0	13	13.0	16	16.0	15	15.0	5	5.0	100	100
66th	45	45.0	25	25.0	16	16.0	10	10.0	4	4.0	100	100
78th	40	45.5	27	30.7	11	12.5	7	8.0	3	3.4	88	100
Alibdaa	13	26.0	20	40.0	13	26.0	4	8.0	0	0.0	50	100
Dar	12	12.9	23	24.7	29	31.2	13	14.0	16	17.2	93	100
Anjal	11	36.7	10	33.3	5	16.7	1	3.3	3	10.0	30	100
Total	227	30.1	185	24.5	182	24.1	104	13.8	57	7.5	755	100
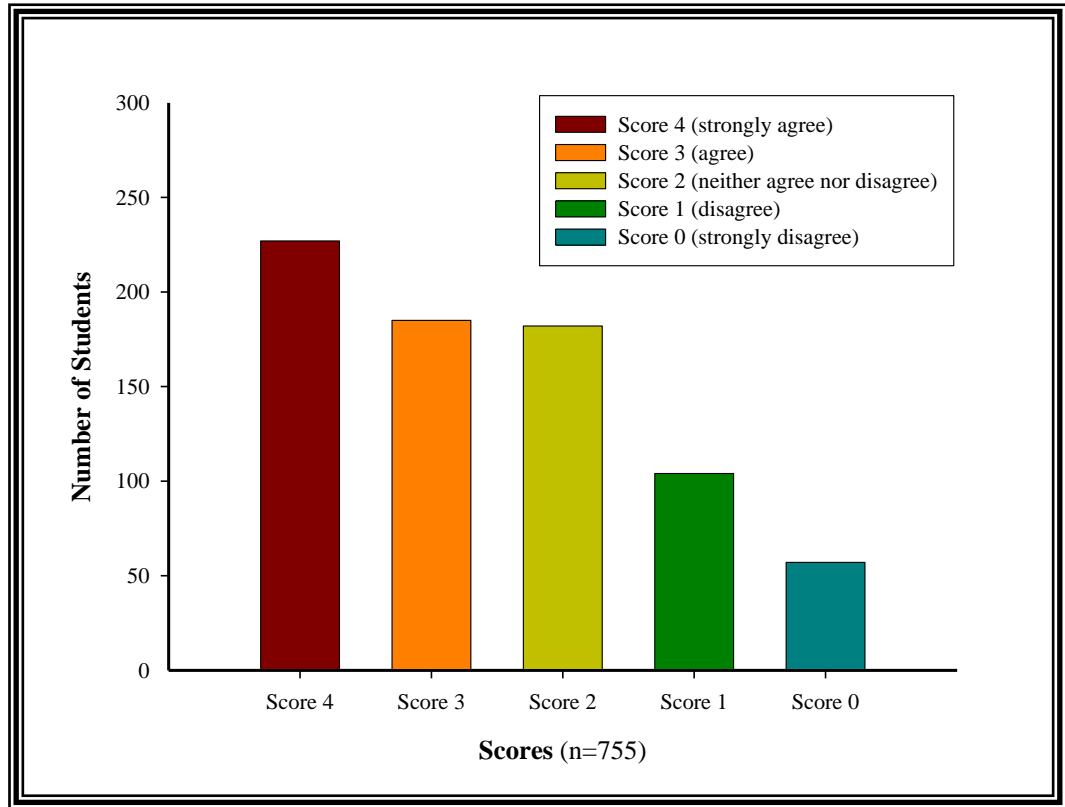
Figure 4. 14: Overall Assessment of Art Classroom Ventilation
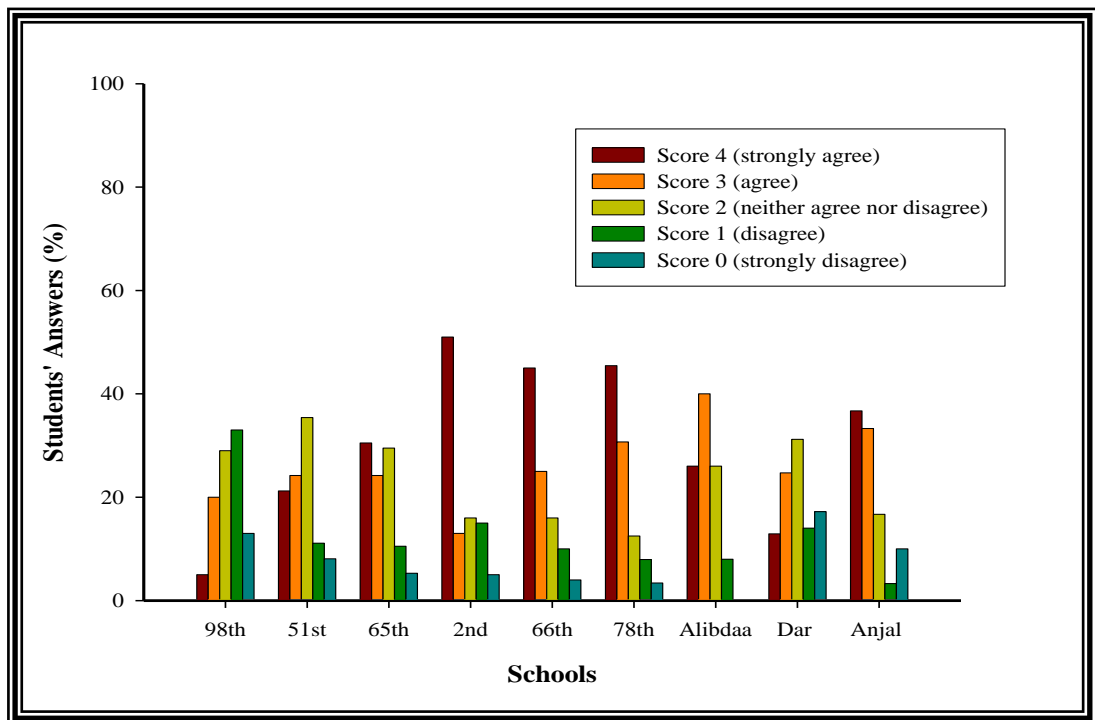
Figure 4. 15: Individual Schools' Assessment of Art Classroom Ventilation

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Ventilation is, as previously discussed in the contextual review, particularly an issue in art classes due to fumes from solvents; drying time and dust which can cause health problems. Students' responses to this question revealed that only a small number (5%) of the 98th school 'strongly agreed' that the ventilation of their art classroom facilitated creativity and encouraged them to try new things while a number of students (33%) disagreed. The reason beyond this is that the art classroom 98th Intermediate School is located in playground area separate from the main school building, there were two windows and two doors in the classroom but only one of the doors was in use; the other door turned into a display. In addition, classroom doors or even windows are usually closed owing to the hot weather outside as well as school visitors and traffic noise.

The second school 51st, third school 65th, fourth school 2nd, and sixth school 78th were of the same building style as there were two windows in the art classroom. Students' responses showed that, 51st school revealed the lowest 'strongly agree' score (21.2%) in comparison to the other three schools. The reason for this low score was due to the fact that students were not able to open the windows which were partially blocked by cupboards, which therefore influenced the classroom ventilation. On the other hand, the 2nd intermediate girls' school revealed the highest 'strongly agree' score (51%) in comparison to other schools. This high score was due to the location of the art classroom on the first floor, which enabled more ventilation when the windows opened in comparison to the other three schools where the art classroom was located on the ground floor.

In the fifth school 66th school, the art classroom was located on the first floor; one large window in this art classroom could be opened and led to improved classroom air quality. Student response scores of 'strongly agree' (45%) and 'strongly disagree' (4.0%) were recorded.

In the seventh school Alibdaa, there was a big wall window covered by green curtains that mostly opened which improved the indoor air quality. Therefore, the highest students' response score in this school was an 'agreement' (40%).

In the eighth school Dar Alhanan, the art classroom was located in the school's basement; there was an exit door that opened just for an emergency and the main

door that opened into the corridor. There were two windows but they were very high so no one could reach them. These factors affected the students' responses to this question which was that only a small number (12.9 %) were 'strongly agreed' that art classroom ventilation created a good environment for creativity and trying new things. Also in this school a number of students (17.2%) 'strongly disagreed' giving the highest 'strongly disagree' score of all schools.

In the ninth school Anjal Albasateen, the art classroom was located on the first floor; there was a large curtained window in the class, which enabled some improvement in ventilation. Students' responses revealed that a number of students who were 'strongly agreed' (36.7 %) were similar to the number of students who 'agreed' (33.3%) that art classroom ventilation created a good environment for creativity and trying new things.

The fourth questionnaire item concerned the temperature in art classrooms and its effects on the creative ability of respondents.

4. The temperature in our art classroom has a negative effect on my creative ability.

Table 4.5 represents students' evaluation of the temperature in their art classrooms on their creative ability. The responses to this question are summarised in Figures 4.16 and 4.17.

Table 4. 5: Students' Assessment of the Temperatures in their Art Classrooms

School	Strongly agree		Agree		Neither agree nor disagree		Disagree		Strongly disagree		Total	
	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)
98th	16	16.0	26	26.0	30	30.0	15	15.0	13	13.0	100	100
51st	37	37.4	28	28.3	20	20.2	6	6.1	8	8.1	99	100
65th	51	53.7	19	20.0	12	12.6	8	8.4	5	5.3	95	100
2nd	20	20.0	18	18.0	27	27.0	12	12.0	23	23.0	100	100
66th	26	26.0	31	31.0	33	33.0	5	5.0	5	5.0	100	100
78th	30	34.1	28	31.8	18	20.5	7	8.0	5	5.7	88	100
Alibdaa	16	32.0	18	36.0	14	28.0	2	4.0	0	0.0	50	100
Dar	29	31.2	29	31.2	25	26.9	7	7.5	3	3.2	93	100
Anjal	10	33.3	13	43.3	1	3.3	1	3.3	5	16.7	30	100
Total	235	31.1	210	27.8	180	23.8	63	8.3	67	8.9	755	100
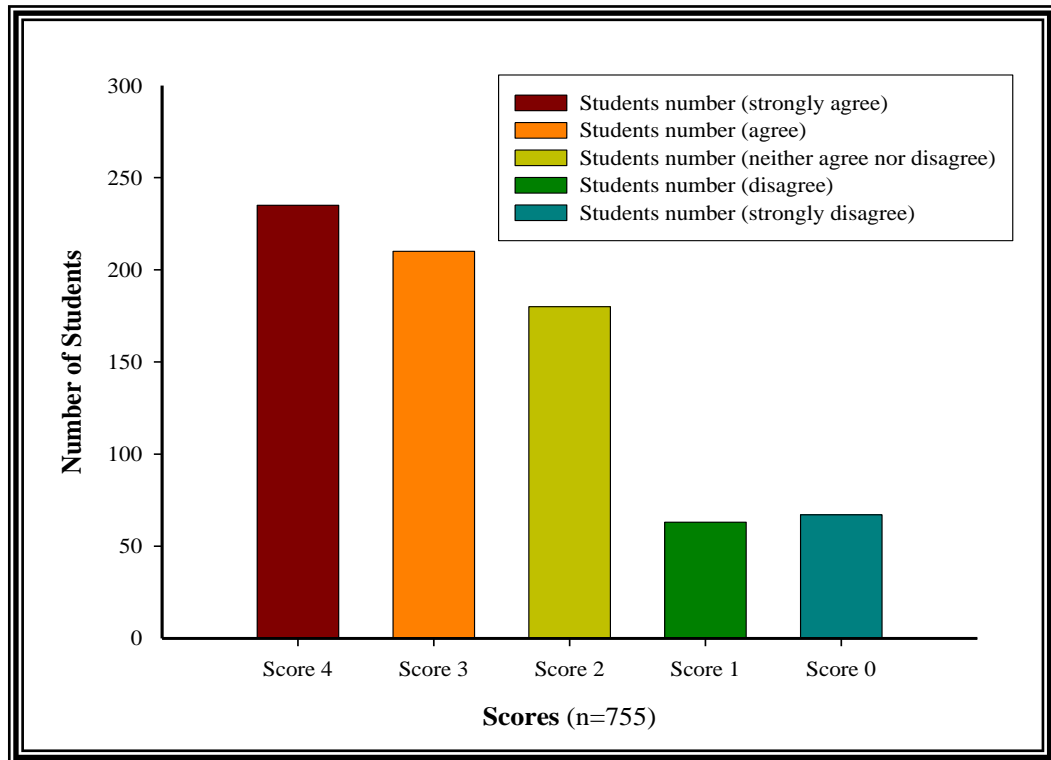
Figure 4. 16: Overall Assessment of Art Classroom Temperatures
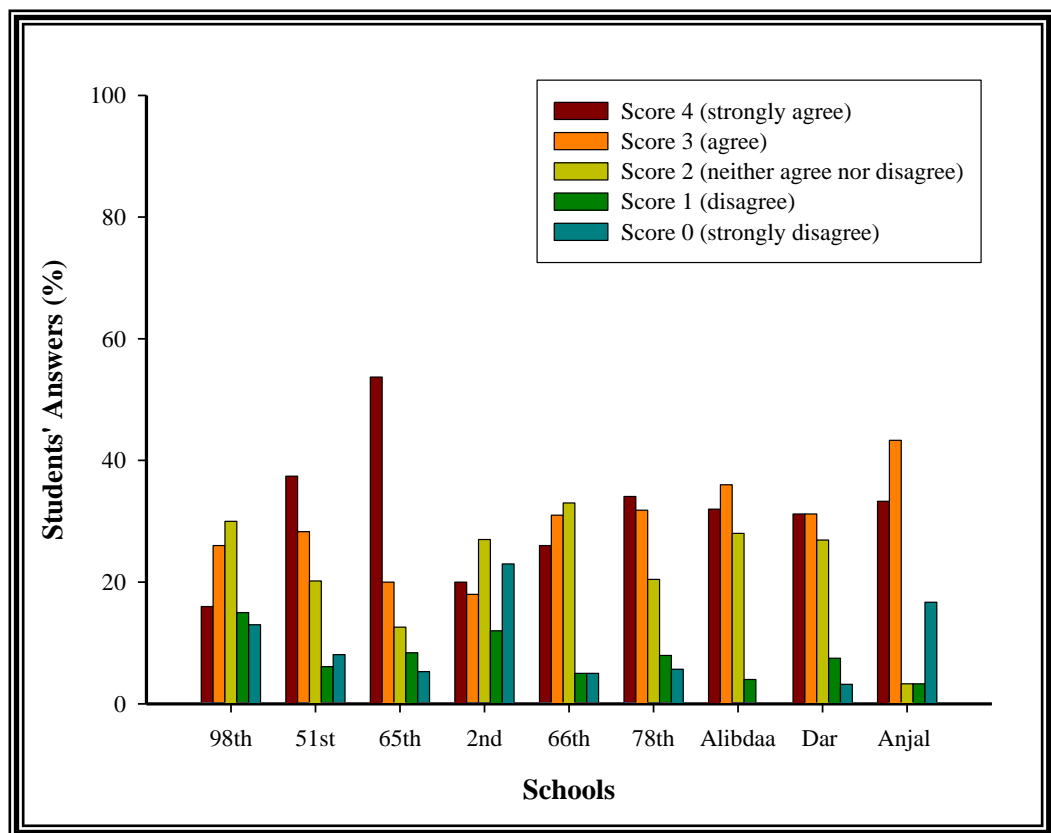
Figure 4. 17: Individual Schools' Assessment of Art Classroom Temperatures

From these findings, more students' responded with a preference toward the agreement side, which reflected that their art classroom temperature limited their creative abilities. The first six schools (public) using two to three window-type air conditioning units, while the last three schools (private) using the split-unit air conditioning.

The fifth item concerned students' opinions of the lighting in their art classrooms.

5. The lighting in the art classroom is helpful in doing art tasks.

Table 4.6 represents students' opinions of the lighting in their art classrooms. The responses to this question are summarised in Figures 4.18 and 4.19.

Table 4. 6: Students' Assessment of the Lighting in their Art Classrooms

School	Strongly agree		Agree		Neither agree nor disagree		Disagree		Strongly disagree		Total	
	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)
98th	23	23.0	26	26.0	14	14.0	15	15.0	22	22.0	100	100
51st	63	63.6	20	20.2	8	8.1	3	3.0	5	5.1	99	100
65th	69	72.6	9	9.5	6	6.3	4	4.2	7	7.4	95	100
2nd	77	77.0	8	8.0	8	8.0	4	4.0	3	3.0	100	100
66th	83	83.0	7	7.0	5	5.0	3	3.0	2	2.0	100	100
78th	58	65.9	15	17.0	12	13.6	1	1.1	2	2.3	88	100
Alibdaa	41	82.0	4	8.0	5	10.0	0	0.0	0	0.0	50	100
Dar	65	69.9	11	11.8	15	16.1	1	1.1	1	1.1	93	100
Anjal	8	26.7	8	26.7	7	23.3	2	6.7	5	16.7	30	100
Total	487	64.5	108	14.3	80	10.6	33	4.4	47	6.2	755	100
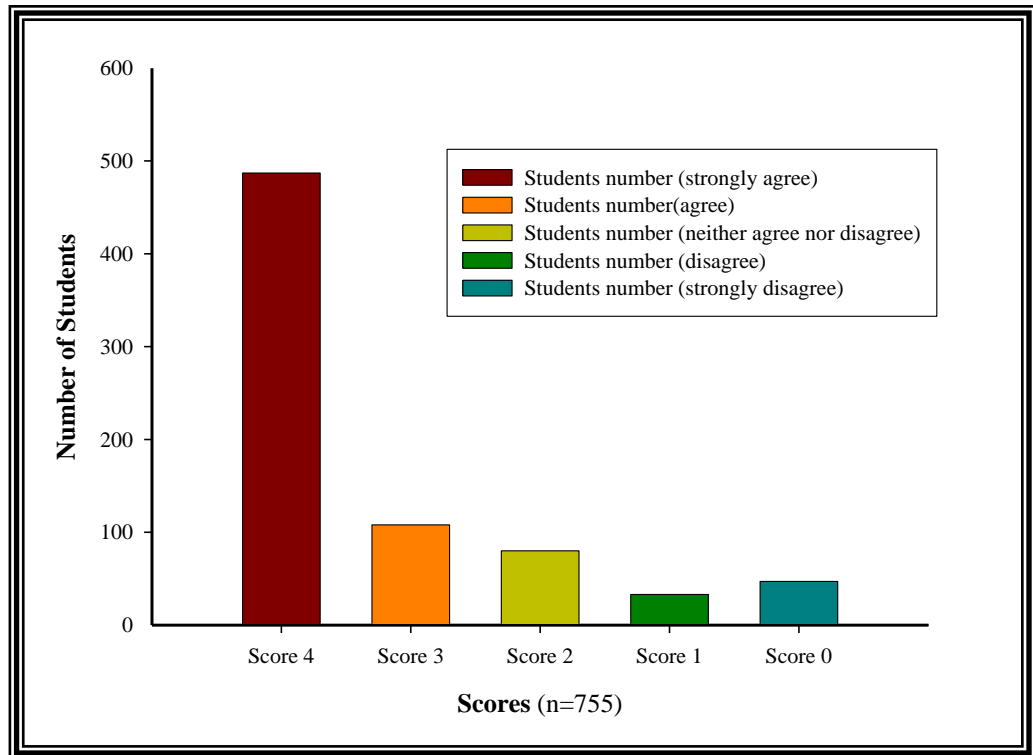
Figure 4. 18: Overall Assessment of the Lighting in Art Classrooms
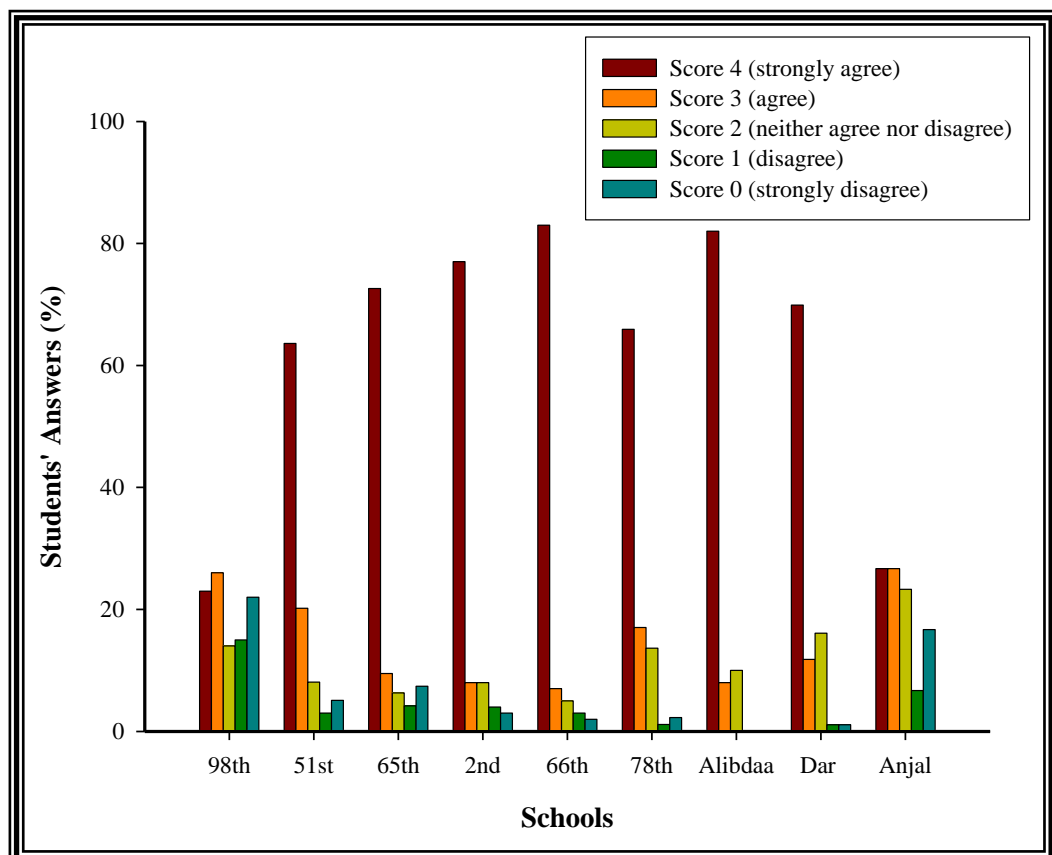
Figure 4. 19: Individual Schools' Assessment of the Lighting in their Art Classrooms

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Lighting is, as previously discussed in the contextual review, required in the art classroom to aid work completion; colours can look different under good lighting and in particular finely detailed work requires bright light. Students' responses revealed that some of the students 'strongly agreed' (64.5%) that the lighting in their art classroom is helpful in doing art tasks. In Saudi Arabia the glare from the sunlight is present all the year as well the artificial light of non-adjustable white fluorescent strips. The school day in Saudi Arabia starts around 7:00 am to 1:30 pm and usually art lessons are scheduled between 10:00 am to 1:30 pm, during this time the natural sunlight is usually sufficient for the classroom. Therefore, the majority of students expressed a preference toward a strong agreement and this reflected the level of their satisfaction. Despite the location of the art classroom in the basement of the Dar Alhanan School the use of sufficient artificial light was reflected by the students' responses from this school where a number of students 'strongly agreed' (69.9%) that the lighting in their art classroom is helpful in doing art tasks.

The sixth item asked respondents whether student noise disrupted their concentration whilst doing art tasks.

6. *During art sessions, student noise has a negative effect on my creative ability.*

Table 4.7 summarises students' opinions of the noise levels in their art classrooms. These are also summarised in Figures 4.20 and 4.21

Table 4. 7: Students' Assessment of the Noise Levels in their Art Classrooms

School	Strongly agree		Agree		Neither agree nor disagree		Disagree		Strongly disagree		Total	
	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)
98th	47	47.0	13	13.0	14	14.0	9	9.0	17	17.0	100	100
51st	33	33.3	20	20.2	24	24.2	14	14.1	8	8.1	99	100
65th	27	28.4	19	20.0	17	17.9	13	13.7	19	20.0	95	100
2nd	49	49.0	17	17.0	12	12.0	11	11.0	11	11.0	100	100
66th	40	40.0	16	16.0	24	24.0	10	10.0	10	10.0	100	100
78th	43	48.9	16	18.2	15	17.0	6	6.8	8	9.1	88	100
Alibdaa	6	12.0	18	36.0	9	18.0	6	12.0	11	22.0	50	100
Dar	9	9.7	12	12.9	33	35.5	16	17.2	23	24.7	93	100
Anjal	4	13.3	6	20.0	7	23.3	9	30.0	4	13.3	30	100
Total	258	34.2	137	18.1	155	20.5	94	12.5	111	14.7	755	100
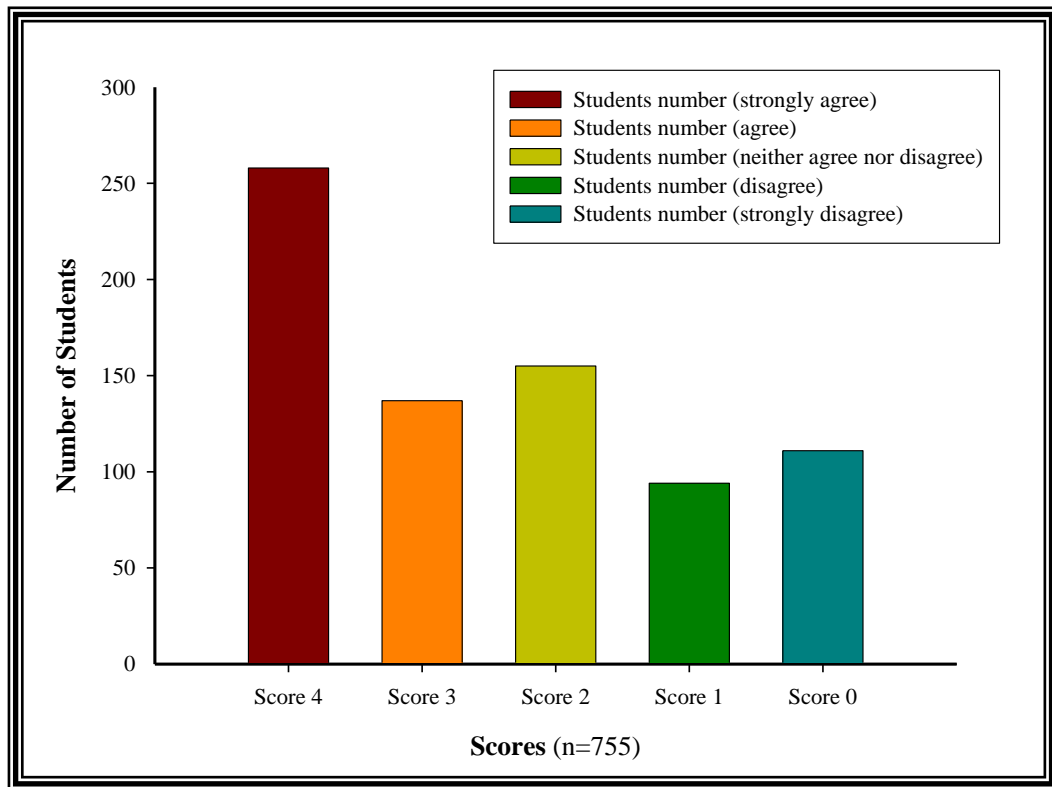
Figure 4. 20: Overall Assessment of the Noise Levels in Art Classrooms
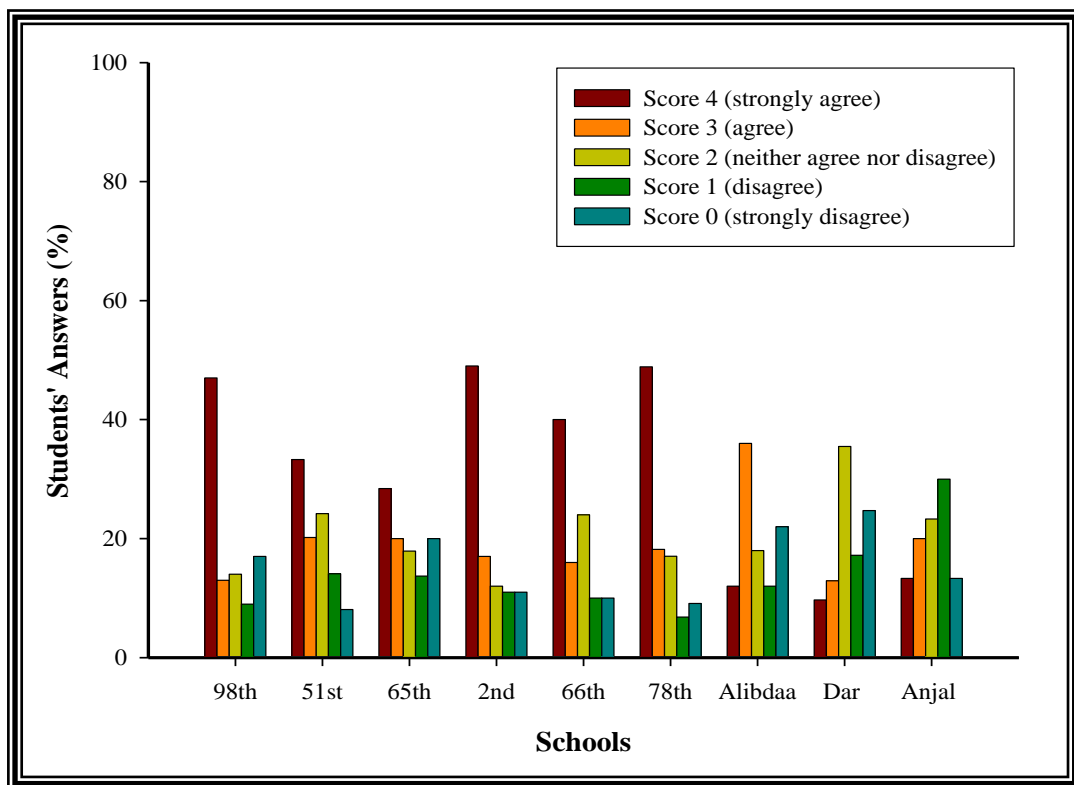
Figure 4. 21: Individual Schools' Assessment of the Noise Levels in Art Classrooms

Noise is, as previously discussed in the contextual review, distracting to both teacher and student. Students' responses to this question revealed that the majority of all six public schools' students expressed a preference toward the agreement side of the answers where the average of the 'strongly agree' score for showing that student noise has a negative impact on their creative ability (41.1%) and the average 'agree' score was much lower (17.4%). On the other hand, students from the other three private schools showed a low mean of 'strongly agree' score (11.7%) and 'agree' score (23%).

The seventh item invited students to rate the suitability of the location of their art classroom, and the effects that this had on their creative ability.

7. The location of our art classroom is suitable and has a positive effect on my creative ability during art sessions.

Table 4.8 identifies students' ratings of the location of their classrooms and the effects that this had on their creative ability. Figures 4.22 and 4.23 also show their responses to this question.

Table 4. 8: Students' Assessment of the Location of their Art Classrooms

School	Strongly agree		Agree		Neither agree nor disagree		Disagree		Strongly disagree		Total	
	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)
98th	27	27.0	19	19.0	20	20.0	10	10.0	24	24.0	100	100
51st	73	73.7	10	10.1	9	9.1	1	1.0	6	6.1	99	100
65th	60	63.2	12	12.6	13	13.7	7	7.4	3	3.2	95	100
2nd	62	62.0	16	16.0	15	15.0	1	1.0	6	6.0	100	100
66th	71	71.0	8	8.0	9	9.0	8	8.0	4	4.0	100	100
78th	36	40.9	20	22.7	21	23.9	10	11.4	1	1.1	88	100
Alibdaa	35	70.0	7	14.0	5	10.0	2	4.0	1	2.0	50	100
Dar	43	46.2	15	16.1	13	14.0	8	8.6	14	15.1	93	100
Anjal	12	40.0	8	26.7	6	20.0	2	6.7	2	6.7	30	100
Total	419	55.5	115	15.2	111	14.7	49	6.5	61	8.1	755	100
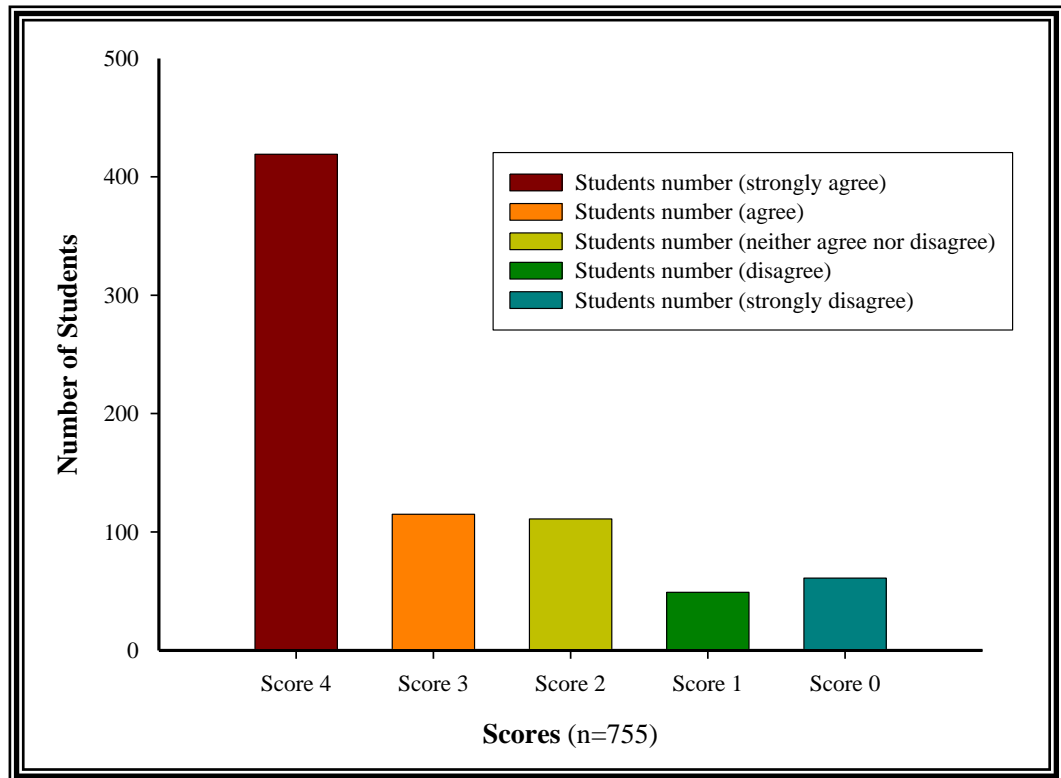
Figure 4. 22: Overall Assessment of the Location of Art Classrooms
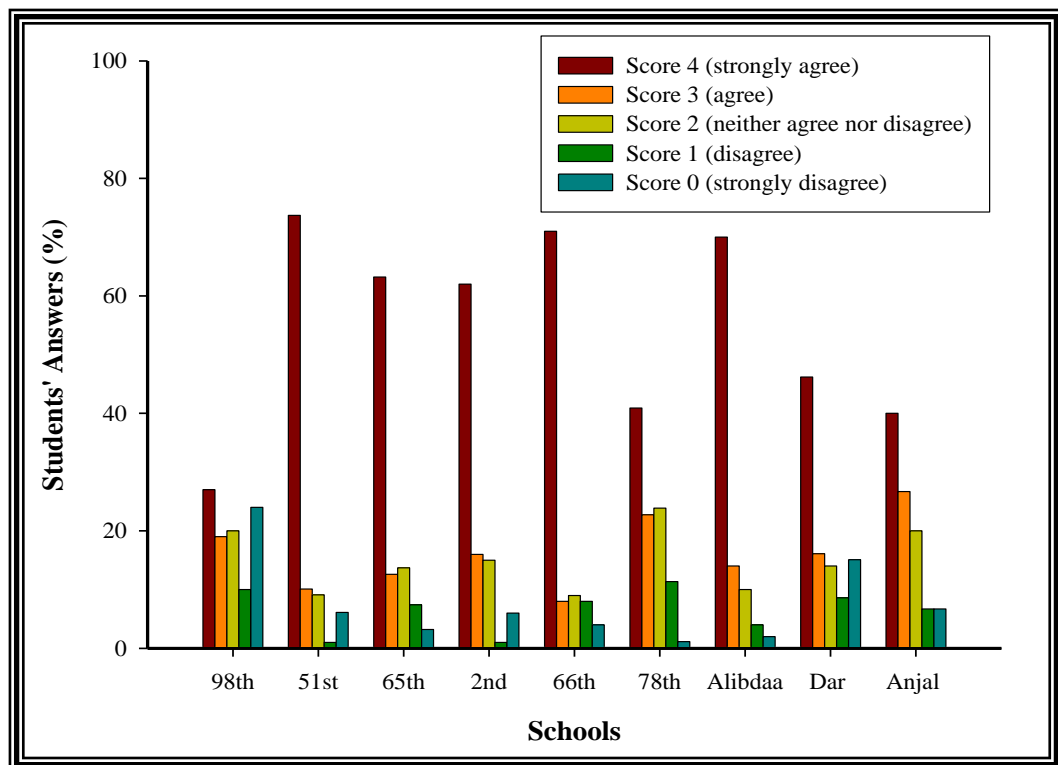
Figure 4. 23: Individual Schools' Assessment of the Location of their Art Classrooms

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All schools showed answers expressing a preference toward the agreement side where the students from 98th school revealed the lowest 'strongly agree' score (27%) while the rest of schools scores varied (40%- 73.7%). The reason beyond this result from 98th school is that the location of the art classroom is in the playground area, which had an impact on some factors of art classroom environment such as temperature and ventilation; in addition, they spent more time getting to their classroom from other classes.

The eighth questionnaire item elicited students' opinions on the design of their art classrooms.

8. The design of our art classroom helps me to try new things in art tasks.

This question dealt with fixed parts of the classroom (architecture) such as the classroom's shape, the distribution of the windows, the location of the door, and the dimensions of the art classroom. Table 4.9 identifies students' opinions on the design of art classrooms. Figures 4.24 and 4.25 also show their responses to this question.

Table 4. 9: Students' Assessment of the Design of their Art Classrooms

School	Strongly agree		Agree		Neither agree nor disagree		Disagree		Strongly disagree		Total	
	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)
98th	26	26.0	10	10.0	20	20.0	14	14.0	30	30.0	100	100
51st	18	18.2	15	15.2	11	11.1	13	13.1	42	42.4	99	100
65th	29	30.5	5	5.3	17	17.9	17	17.9	27	28.4	95	100
2nd	11	11.0	11	11.0	22	22.0	10	10.0	46	46.0	100	100
66th	32	32.0	31	31.0	16	16.0	9	9.0	12	12.0	100	100
78th	33	37.5	23	26.1	23	26.1	5	5.7	4	4.5	88	100
Alibdaa	14	28.0	8	16.0	13	26.0	8	16.0	7	14.0	50	100
Dar	23	24.7	21	22.6	17	18.3	13	14.0	19	20.4	93	100
Anjal	11	36.7	11	36.7	4	13.3	0	0.0	4	13.3	30	100
Total	197	26.1	135	17.9	143	18.9	89	11.8	191	25.3	755	100

Figure 4. 24: Overall Assessment of the Design of Art Classrooms
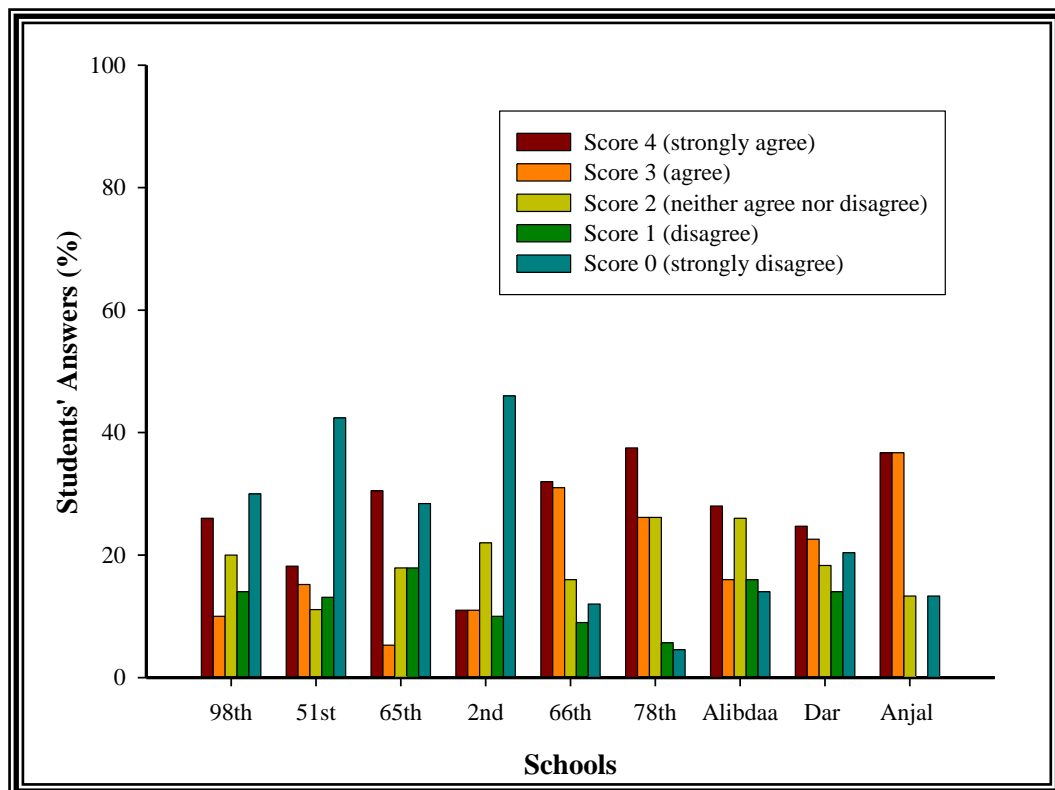
Figure 4. 25: Individual Schools' Assessment of the Design of their Art Classrooms

Art classrooms were designed as general classrooms in most of the schools, however, a consideration of the necessary special facilities required to teach art effectively should have been reflected upon when the room was selected. Design of an art classroom is influenced by many factors such as furniture distribution and display. For example, in 98th school the art classroom consisted of two different sized rooms opened together, therefore, students in one side of the classroom could not view the whole of the classroom because of the room shape difference. On the other hand, Anjal Albasateen private school building was designed originally as a modern villa and the art classroom was reformed to give the ceiling different levels with gypsum-board. The floor has been constructed of designed tiles. The highest percentage of disagreement was in the 2nd school but it is unclear why this percentage was so high (46%), because the Likert-scale does not enable explanation. It is possible that the reason may be that these students have three different teachers and the class is shared between secondary and intermediate school. Overall, students' responses expressed a preference towards agreement and the highest scores were given by the private school students.

Questions 3 to 8 related to the physical environment and served to evaluate the effect of different factors within the art classroom (such as ventilation, temperature, lighting, noise, location, and design) on students' ability to engage in creative and critical thinking during art sessions.

The ninth question addressed the suitability of the art classroom furniture and its effect on the ability of students to try new things.

9. The furniture in our art classroom is suitable and comfortable. It increases my ability to try new things in art tasks.

Table 4.10 summarises student evaluations concerning art classroom furniture and its effect on their ability to try new things in art tasks. Figures 4.26 and 4.27 illustrate their responses to this question.

Table 4. 10: Students' Assessment of Art Classroom Furniture and its Effect on their Ability to Try New Things in Art Tasks

School	Strongly agree		Agree		Neither agree nor disagree		Disagree		Strongly disagree		Total	
	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)
98th	3	3.0	4	4.0	9	9.0	17	17.0	67	67.0	100	100
51st	8	8.1	8	8.1	11	11.1	11	11.1	61	61.6	99	100
65th	7	7.4	7	7.4	14	14.7	10	10.5	57	60.0	95	100
2nd	24	24.0	4	4.0	3	3.0	3	3.0	66	66.0	100	100
66th	27	27.0	25	25.0	21	21.0	5	5.0	22	22.0	100	100
78th	35	39.8	29	33.0	7	8.0	8	9.1	9	10.2	88	100
Alibdaa	22	44.0	9	18.0	5	10.0	8	16.0	6	12.0	50	100
Dar	29	31.2	22	23.7	13	14.0	12	12.9	17	18.3	93	100
Anjal	13	43.3	4	13.3	5	16.7	4	13.3	4	13.3	30	100
Total	168	22.3	112	14.8	88	11.7	78	10.3	309	40.9	755	100
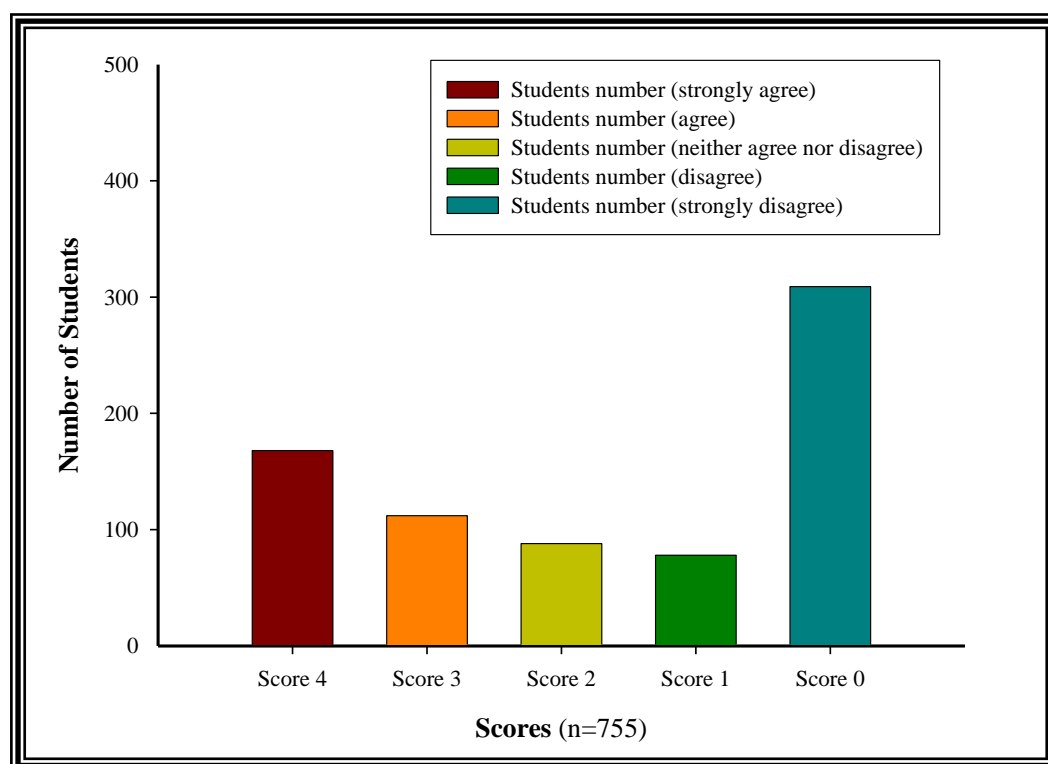
Figure 4. 26: Overall Assessment of Art Classroom Furniture and its Effect on the Ability to Try New Things in Art Tasks
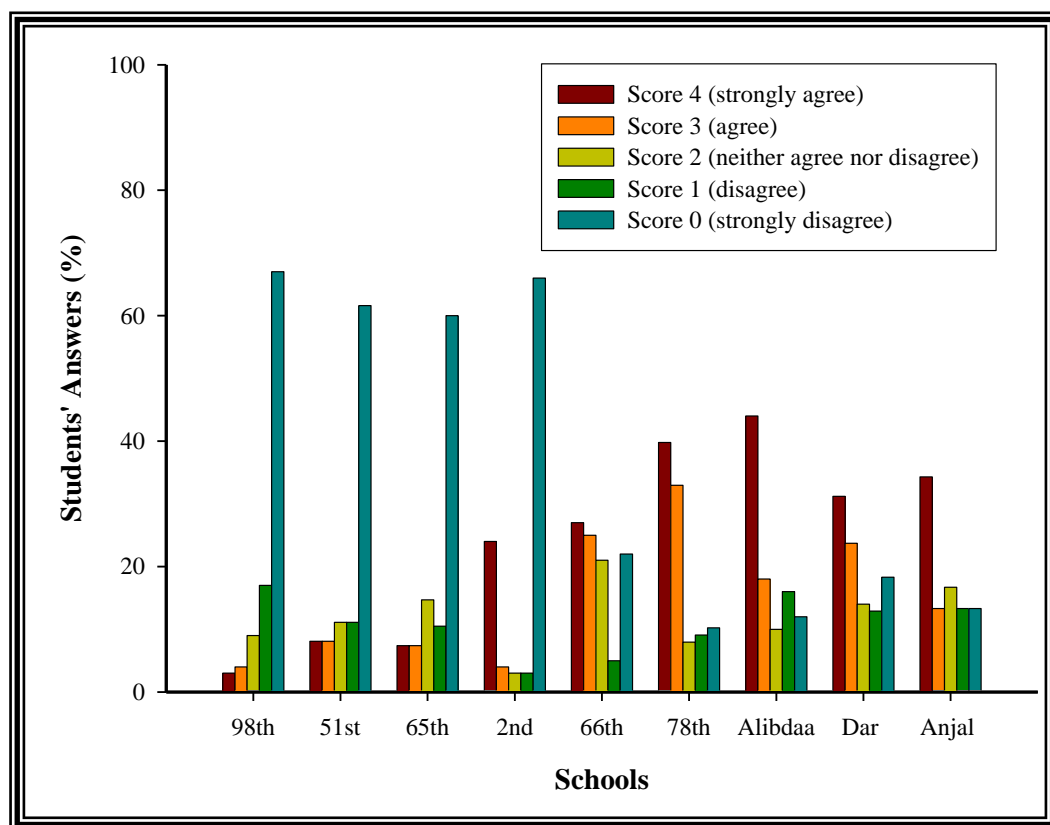
Figure 4. 27: Individual Schools' Assessment of Art Classroom Furniture and its Effect on the Ability to Try New Things in Art Tasks

Overall students' response for this question revealed that a number of students (40.9%) 'strongly disagreed' that the furniture in their art classroom is suitable and comfortable and this affected their ability to try new things in art tasks, while a number of students (22.3%) 'strongly agreed' with reference this question. This rise in the overall level of 'strongly disagree' score was owing to the responses of the first four schools 98th, 51st, 65th, and 2nd with the 'strongly disagree' score widely ranging (60%-67%). The reason for this high score in these four schools was that in the first school 98th the seats were big plastic chairs that are usually used outdoors and could bend easily. There was also no balance in height between tables and seats, which led to some students standing during sessions. The seats of the second school 51st were plastic and constructed with uncomfortable seat backs, the number of available seats was not sufficient for all students, therefore, some students seated themselves on the floor. In addition, there was no balance in height between tables and seats. For the third school 65th, seats were too small and not suitable for all students owing to varieties in their body sizes, therefore, some students prefer to sit

on the floor or stand-up rather to sit in uncomfortable seats. Available art classroom tables in the fourth school 2nd were too high and used chairs were uncomfortable for students, which meant some students preferred to sit on the floor. The rest of the selected schools were using suitable seats that matched the tables' height and students showed more satisfaction.

The tenth item examined students' views on the layout of their art classrooms.

10. The layout of our art classroom helps me to try new things in art tasks.

Table 4.11 summarises students' views on the layout of their art classrooms. Figures 4.28 and 4.29 show their responses to this question.

Table 4. 11: Students' Assessment of the Layout of their Art Classrooms

| School	Strongly agree		Agree		Neither agree nor disagree		Disagree		Strongly disagree		Total	
	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)
98th	7	7.0	3	3.0	12	12.0	14	14.0	64	64.0	100	100
51st	6	6.1	8	8.1	22	22.2	13	13.1	50	50.5	99	100
65th	13	13.7	13	13.7	18	18.9	13	13.7	38	40.0	95	100
2nd	11	11.0	5	5.0	17	17.0	12	12.0	55	55.0	100	100
66th	29	29.0	19	19.0	21	21.0	11	11.0	20	20.0	100	100
78th	38	43.2	20	22.7	19	21.6	3	3.4	8	9.1	88	100
Alibdaa	12	24.0	10	20.0	2	4.0	17	34.0	9	18.0	50	100
Dar	13	14.0	14	15.1	18	19.4	19	20.4	29	31.2	93	100
Anjal	11	36.7	8	26.7	6	20.0	1	3.3	4	13.3	30	100
Total	140	18.5	100	13.2	135	17.9	103	13.6	277	36.7	755	100

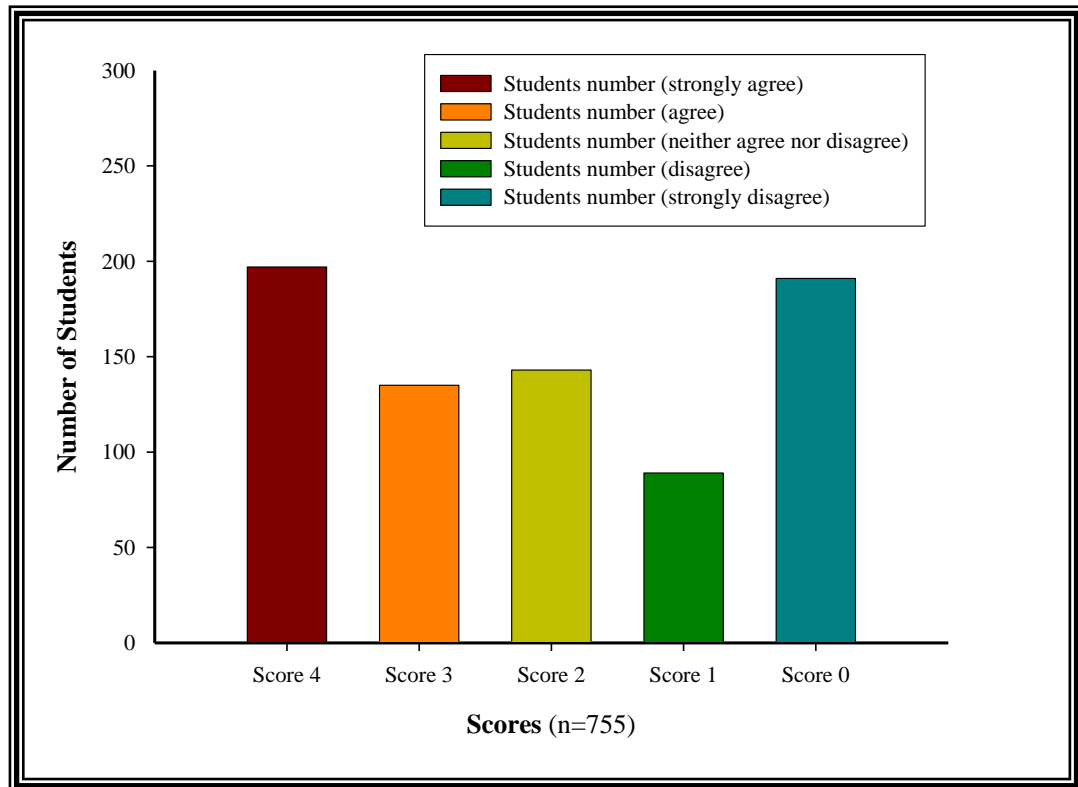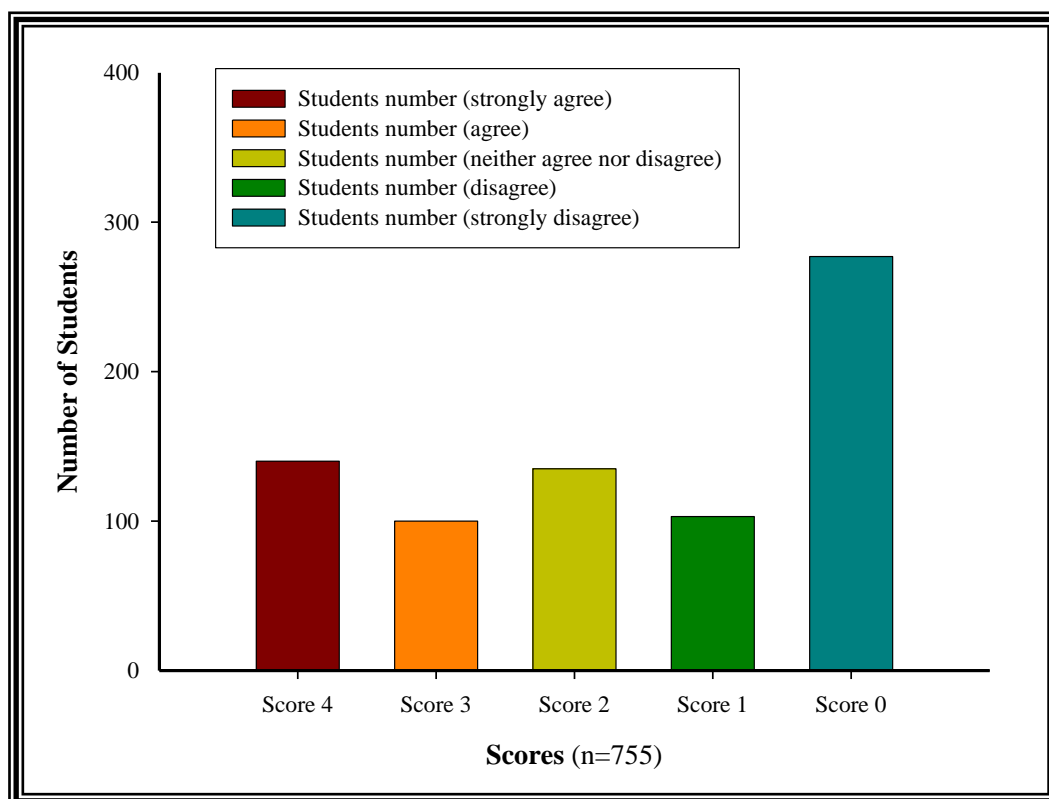**Figure 4. 28:** Overall Assessment of the Layout of Art Classrooms
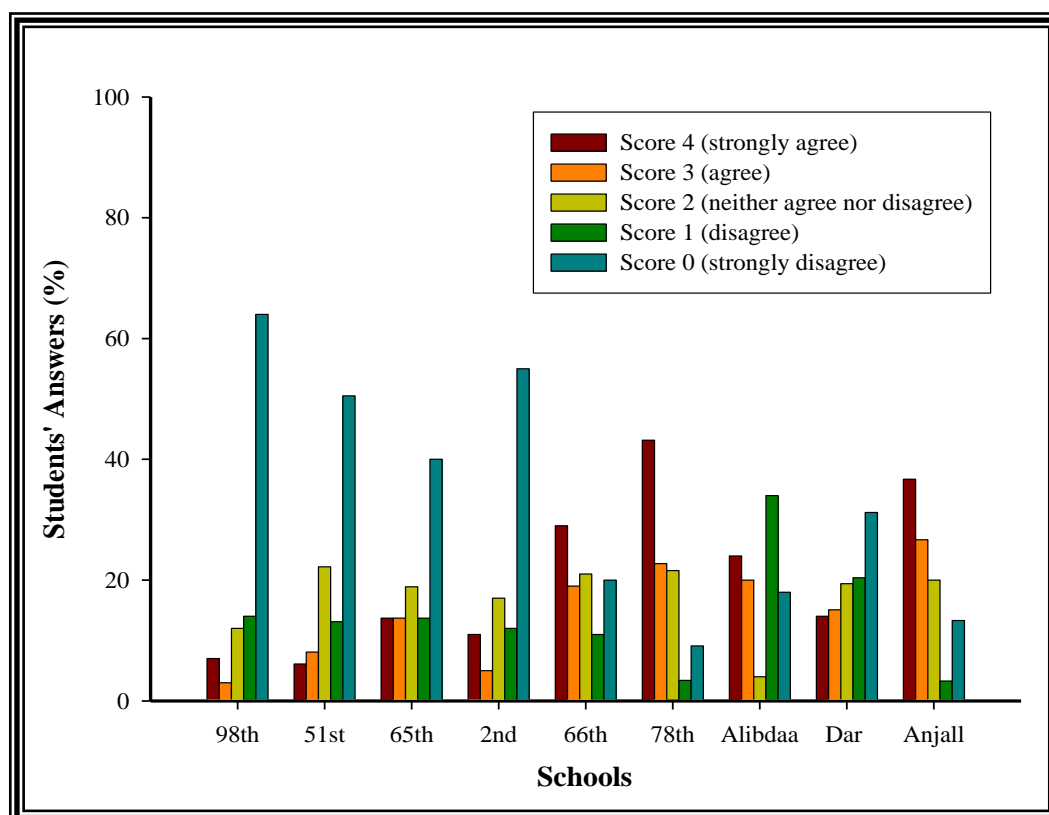
Figure 4. 29: Individual Schools' Assessment of the Layout of Their Art Classrooms

In the first school 98th, the arrangement of the layout of tables was a single line. Many students did not have a place to sit due to the layout of the table arrangement. Furthermore, some of them sat near the table and others moved back in order to feel more comfortable. A number of students (64%) 'strongly disagreed' that their art classroom layout helped them to try new things in art tasks. This school scored the highest disagreement of all the schools. Students were not able to move around the room because poor layout had led to a lack of space. The classroom was used to teach art and sewing subjects, so textile equipment such as mannequins were kept in the classroom.

In the second school 51st, the layout of the table arrangement was an L-shape. Many students did not have a place to sit, this was due to the table layout arrangement and a shortage of tables; there were only two. Students were seated in different ways, some of them were near the table, others moved back to feel more comfortable, and others seated themselves on the floor to avoid overlapping. Over half of the students (50.5%) 'strongly disagreed'.

The layout of the table arrangement in the third school 65th was a horseshoe arrangement. Many students did not have a place to sit due to the layout of the table arrangement. Students were seated in different ways, some of them were at the table, others moved back in order to feel more comfortable, and others seated themselves on the floor or stood up to avoid overlapping. Students 'strongly disagreed' (40%) while a number 'strongly agreed' (13.7%).

In the fourth school 2nd, the layout of the table arrangement was in two horizontal lines. Some students did not have a place to sit owing to the layout of the table arrangement and limited tables. Students preferred to sit on the floor to avoid overlapping. Over half of students (55%) 'strongly disagreed'.

In the fifth school 66th, the layout of the table arrangement was a horseshoe arrangement. In this school a number of students 'strongly agreed' (29%) and fewer students (20%) 'strongly disagreed'.

The layout of the table arrangement in the sixth school 78th was a grouping type of arrangement with comfortable tables and seats. Student responses to this question in this school revealed that students 'strongly agreed' (43.2%).

In the seventh school Alibdaa, the layout of the table arrangement was a horseshoe arrangement but the tables were fixed on the floor and could not move. The number of students in this school 'strongly agreed' (24%) was lower than those who disagreed (34%).

The layout of the table arrangement in the eighth school Dar Alhanan was a horseshoe arrangement with a central table. Students preferred to sit at the central table and the rest of the students were scattered around the class on the horseshoe of tables, which arguably affected their communication. Student responses to this question showed that a number of students 'strongly disagreed' (31.2%) that their art classroom layout helped them to try new things in art task, while a small number 'strongly agreed' (14%).

In the ninth school Anjal Albasateen, the layout of the table arrangement was a horseshoe arrangement. The number of students in the class was small compared to the size of the classroom. In this school the 'strongly agreed' response was higher (36.7%) than the 'strongly disagreed' response (13.3%).

The eleventh question sought students' views on the work display within their art classrooms.

11. The work display in our classroom inspires me to be more creative.

Table 4.12 summarises students' views on whether the display of their art work in the classrooms inspired them to be more creative. Figures 4.30 and 4.31 describe their responses to this item.

Table 4. 12: Students' Assessment of the work displays in Their Art Classrooms

School	Strongly agree		Agree		Neither agree nor disagree		Disagree		Strongly disagree		Total	
	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)
98th	7	7.0	7	7.0	18	18.0	18	18.0	50	50.0	100	100
51st	21	21.2	15	15.2	25	25.3	19	19.2	19	19.2	99	100
65th	13	13.7	18	18.9	18	18.9	24	25.3	22	23.2	95	100
2nd	15	15.0	10	10.0	21	21.0	5	5.0	49	49.0	100	100
66th	29	29.0	18	18.0	16	16.0	10	10.0	27	27.0	100	100
78th	26	29.5	15	17.0	10	11.4	14	15.9	23	26.1	88	100
Alibdaa	13	26.0	8	16.0	12	24.0	6	12.0	11	22.0	50	100
Dar	25	26.9	16	17.2	15	16.1	17	18.3	20	21.5	93	100
Anjal	9	30.0	6	20.0	5	16.7	4	13.3	6	20.0	30	100
Total	158	20.9	113	15.0	140	18.5	117	15.5	227	30.1	755	100
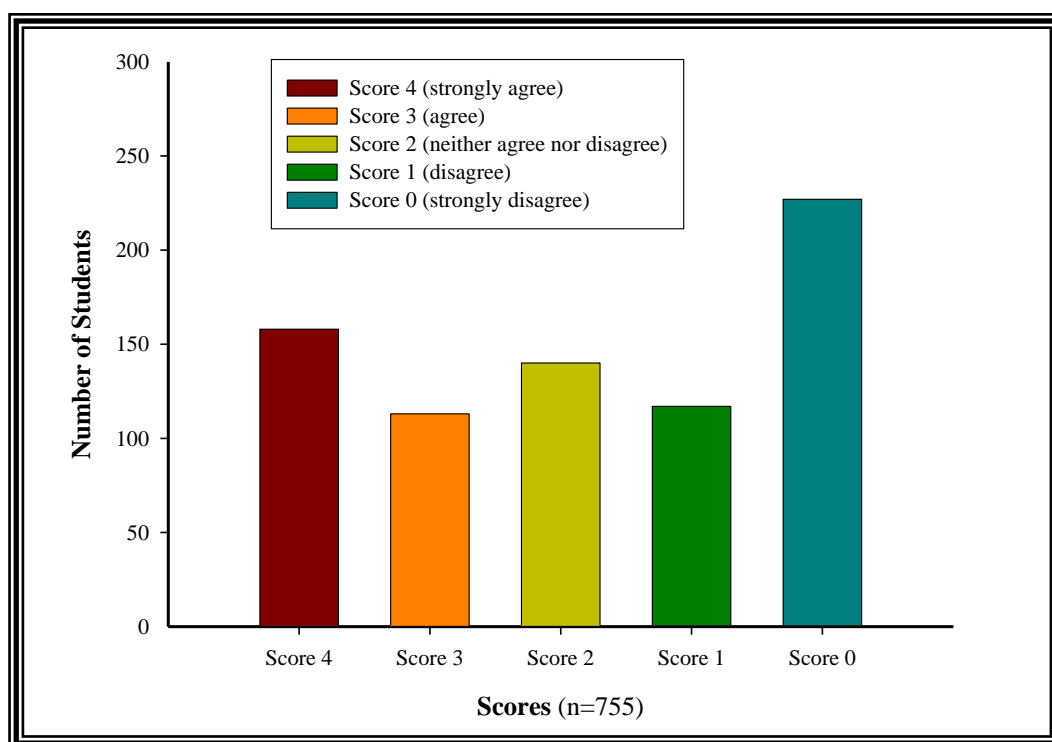
Figure 4. 30: Overall Assessment of the work displays in Art Classrooms
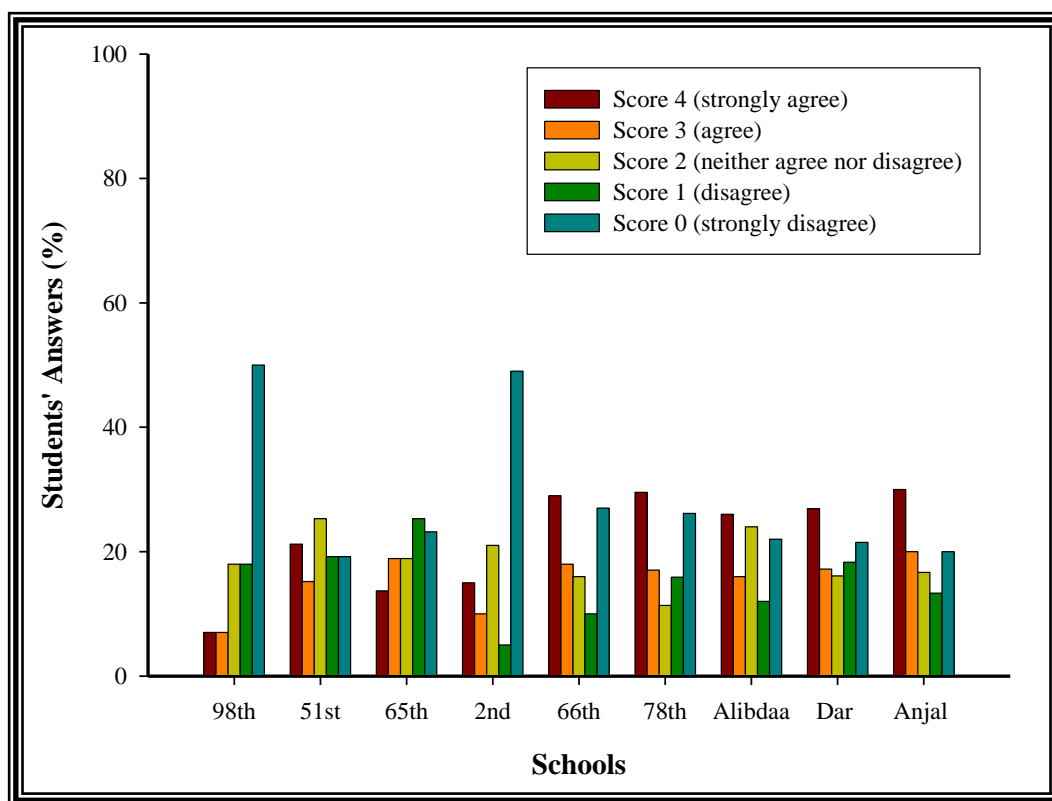
Figure 4. 31: Individual Schools' Assessment of the work displays in their Art Classrooms

The results obtained from this question showed that the overall 'strongly disagreed' students' score was higher (30.1%) than those students who 'strongly agreed' (20.9%) that the work displays in their art classroom inspired them to be more creative. The students' answers varied in each school as follows:

The art classroom in first school 98th was shared by two teachers in different subjects; it was used to teach both art and sewing. As a result, there were sewing materials and only a few simple artworks hanging on the wall. Therefore, half of students 'strongly disagreed' (50%) that art classroom work displayed in their art classroom inspired them and this result was the highest result of all the selected schools.

In the second school 51st, two teachers were sharing an art classroom. It was used for art subject lessons of both intermediate and secondary school levels. The displayed materials were related to the secondary school students. The presence of the displayed artworks made some students 'strongly agree' that their art classroom work

displays inspired them to be more creative (21.2%). Some students felt disappointed because they wanted to see their projects hanging in the classroom 'we always work but we never saw our work displayed'; therefore, a number of them (19.2%) 'strongly disagreed' with regard to this question.

The art classroom display of the third school 65th was empty; there were two unutilised bare frames which created many free spaces for display. The difference between the room and general class was the table arrangement. Student responses to this question revealed that some students 'strongly disagreed' (23.2%) that art classroom work displayed in their art classroom inspired them to be more creative while a lower number 'strongly agreed' (13.7%).

In the fourth school 2nd, the art classroom was shared between three teachers; it was used to teach both intermediate and secondary school levels. There was no display because all teachers depended on other teachers to decorate the classroom. Therefore, no-one took responsibility. This circumstance was reflected in students' replies where almost half of students (49%) 'strongly disagreed' that art classroom work displayed in their art classroom inspired them to be more creative giving the second highest 'strongly disagree' score of all schools while only a small number 'strongly agreed' (15%).

The art classroom in the fifth school 66th was full of the displayed and overlapping projects related to previous years. Therefore, some projects were hidden and could not be seen. In addition, the displayed materials contained some dust which might have affected students' health. Also some displayed materials were of a higher level than the students'. In this school the number of students that 'strongly agreed' (29%) that art classroom work display in their art classroom inspired them to be more creative was quite similar to the number of students that 'strongly disagreed' (27%).

In the sixth school 78th the art classroom was painted with a light yellow colour with some red flowers on the wall; in addition there were some projects and information on the bulletin board but with inappropriate text size which students could not read easily. There were many unhung projects on the sides of the classroom. In this school the number of students that 'strongly agreed' that their art classroom inspired them to

be more creative was slightly higher (29.5%) than the number of students that 'strongly disagreed' (26.1%).

In the seventh school Alibdaa, eighth school Dar Alhanan, and ninth school Anjal Albasateen private schools, there were few displays. Students' responses to this question expressed a preference towards the agreement side, which was slightly higher than the disagreement side.

The twelfth question asked students whether the colour(s) of their art classroom walls helped them to concentrate.

12. The colour(s) of our art classroom walls helps me to concentrate and makes me more comfortable.

Table 4.13 summarises students' opinions of the colour of their art classroom walls. Figures 4.32 and 4.33 also depict their answers to this question.

Table 4. 13: Students' Assessment of the Colour(s) of Their Classroom Walls

School	Strongly agree		Agree		Neither agree nor disagree		Disagree		Strongly disagree		Total	
	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)
98th	14	14.0	18	18.0	19	19.0	17	17.0	32	32.0	100	100
51st	5	5.1	3	3.0	13	13.1	10	10.1	68	68.7	99	100
65th	24	25.3	20	21.1	16	16.8	6	6.3	29	30.5	95	100
2nd	27	27.0	7	7.0	4	4.0	11	11.0	51	51.0	100	100
66th	49	49.0	14	14.0	10	10.0	5	5.0	22	22.0	100	100
78th	41	46.6	31	35.2	8	9.1	3	3.4	5	5.7	88	100
Alibdaa	10	20.0	8	16.0	8	16.0	4	8.0	20	40.0	50	100
Dar	20	21.5	22	23.7	12	12.9	5	5.4	34	36.6	93	100
Anjal	9	30.0	1	3.3	2	6.7	5	16.7	13	43.3	30	100
Total	199	26.4	124	16.4	92	12.2	66	8.7	274	36.3	755	100
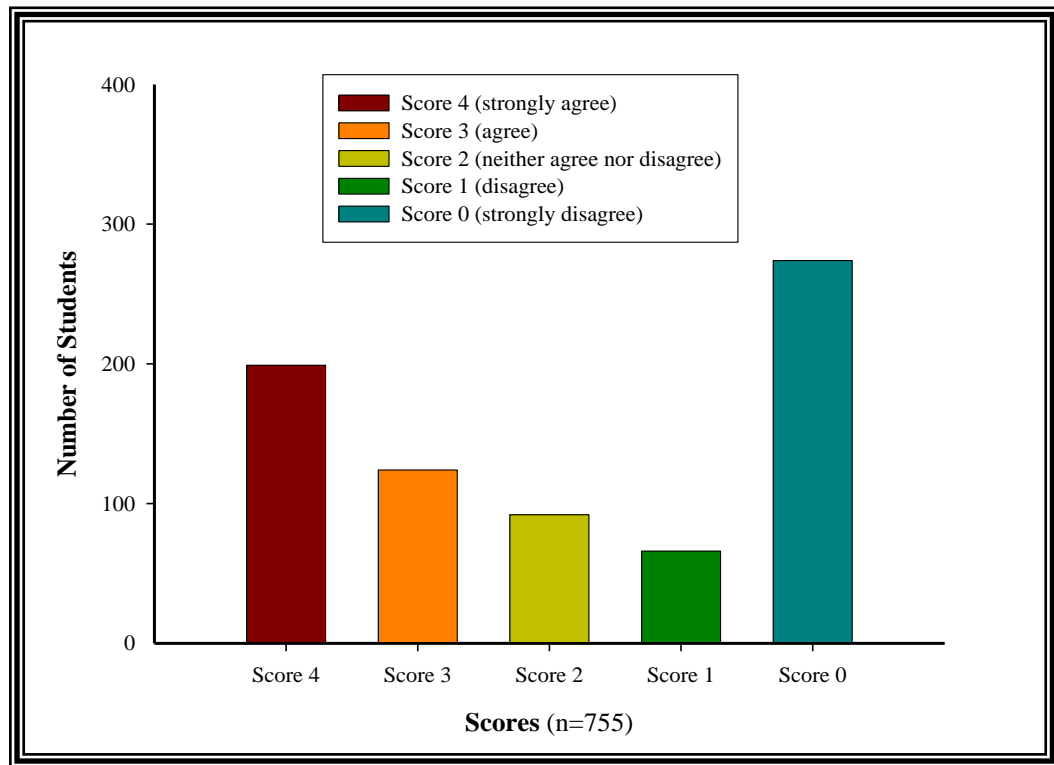
Figure 4. 32: Overall Assessment of the Colour(s) of Art Classroom Walls
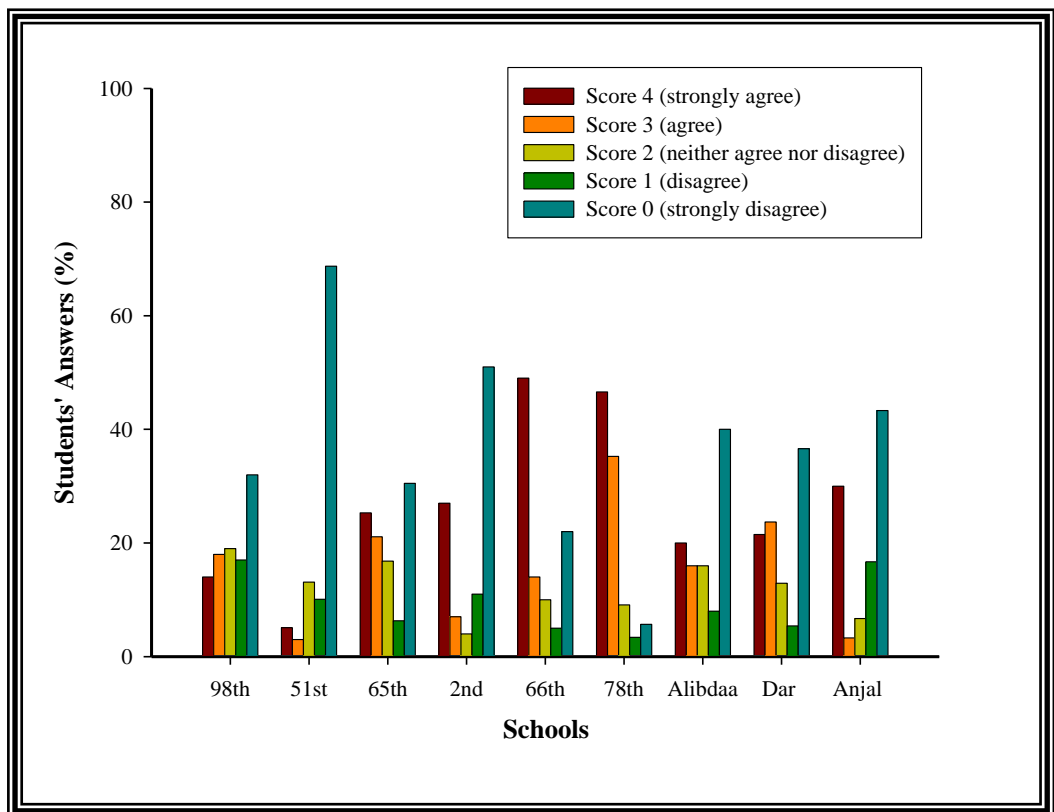
Figure 4. 33: Individual Schools' Assessment of the Colour(s) of Their Art Classroom Walls

The colour of art classroom walls varied in all the selected schools. The overall students' response to this question was that the number of students 'strongly disagreed' that the colour(s) of their art classroom walls helped them to concentrate and made them more comfortable was higher (36.3%) than the number who 'strongly agreed' (26.4%).

The first school's 98th art classroom walls were painted a mixture of colours; some walls were light green and others were orange. The second school 51st, third school 65th, and fourth school 2nd, art classrooms were all painted with light green (the same colour scheme as all other classrooms) in these schools so the students might feel no difference. Students from these schools revealed a higher level of strong disagreement than the 'strongly agree' scores.

The fifth school's 66th art classroom walls were painted with light pink, therefore, the students response showed that almost half of them 'strongly agreed' (49%) that art classroom wall colour helped them to concentrate and made them more comfortable. This was the highest agreement score of all schools and this was possibly owing to the fact that the pink colour is stereotypically associated with girls. The second highest 'strongly agree' score with this question was in 78th (46.6%), this is possibly related to the light yellow colours with red flowers that were painted on the walls.

Regarding the private schools, in the seventh school Alibdaa and eighth school Dar Alhanan, the wall colour was white, while in the ninth school Anjal Albasateen the colour was dark amber yellow. Of all the private schools Anjal Albasateen school had the highest 'strongly disagree' score (43.3%). In addition, students and especially teachers were not enamoured with this colour scheme because it was difficult to find art projects that matched with it and students were uncomfortable in this environment.

Questions 9 to 12 related to factors of the art classroom environment that could be rearranged, including layout, furniture, work displays and the colour(s) of the classroom walls. The art teacher can have the walls of the art classroom repainted. These questions analysed the effect of changeable factors on students' ability to be engaged in creative and critical thinking.

The thirteenth question concerned students' evaluation of the importance of the sink in the art classroom.

13. The sink helps me to try new things in my art tasks, by allowing me to wash my hands and tools.

Table 4.14 summarises students' appraisal of the importance of the sink in the art classroom. Figures 4.34 and 4.35 also show their answer to this question.

Table 4. 14: Students' Assessment of the Importance of the Sink in the Art Classroom

School	Strongly agree		Agree		Neither agree nor disagree		Disagree		Strongly disagree		Total	
	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)
98th	84	84.0	6	6.0	2	2.0	5	5.0	3	3.0	100	100
51st	93	93.9	3	3.0	0	0.0	1	1.0	2	2.0	99	100
65th	45	47.4	10	10.5	10	10.5	9	9.5	21	22.1	95	100
2nd	78	78.0	1	1.0	2	2.0	7	7.0	12	12.0	100	100
66th	79	79.0	5	5.0	4	4.0	4	4.0	8	8.0	100	100
78th	57	64.8	6	6.8	5	5.7	5	5.7	15	17.0	88	100
Alibdaa	36	72.0	8	16.0	5	10.0	1	2.0	0	0.0	50	100
Dar	72	77.4	9	9.7	6	6.5	6	6.5	0	0.0	93	100
Anjal	23	76.7	2	6.7	2	6.7	2	6.7	1	3.3	30	100
Total	567	75.1	50	6.6	36	4.8	40	5.3	62	8.2	755	100
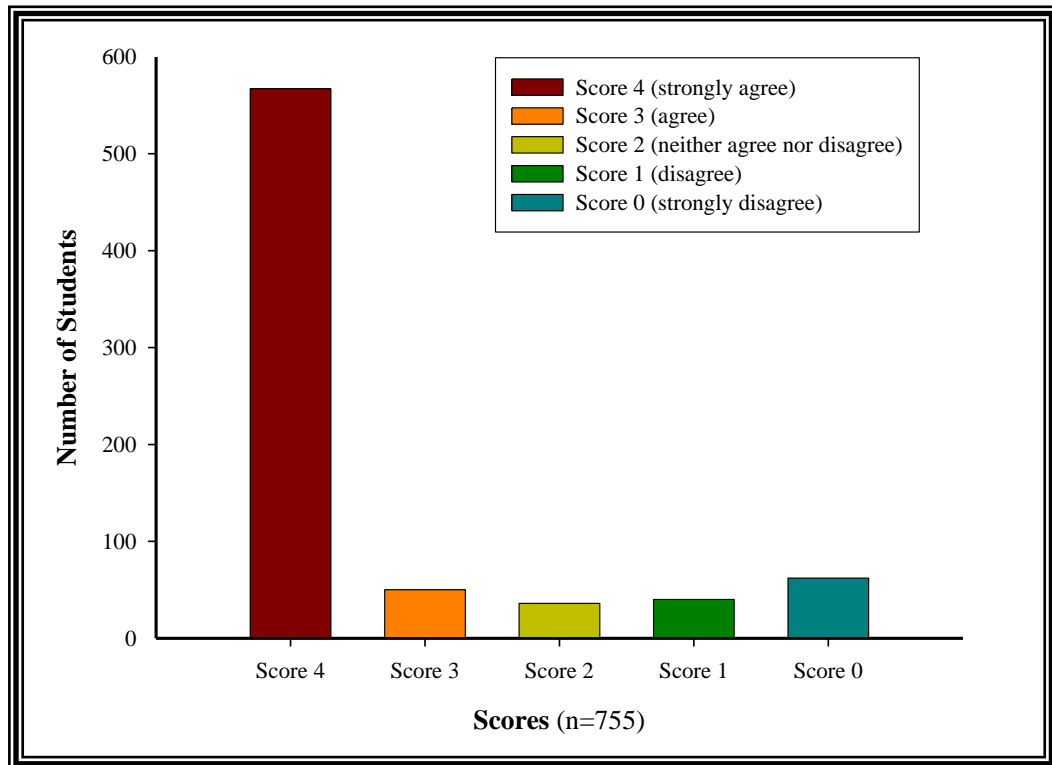
Figure 4. 34: Overall Assessment of the Importance of the Sink in the Art Classroom
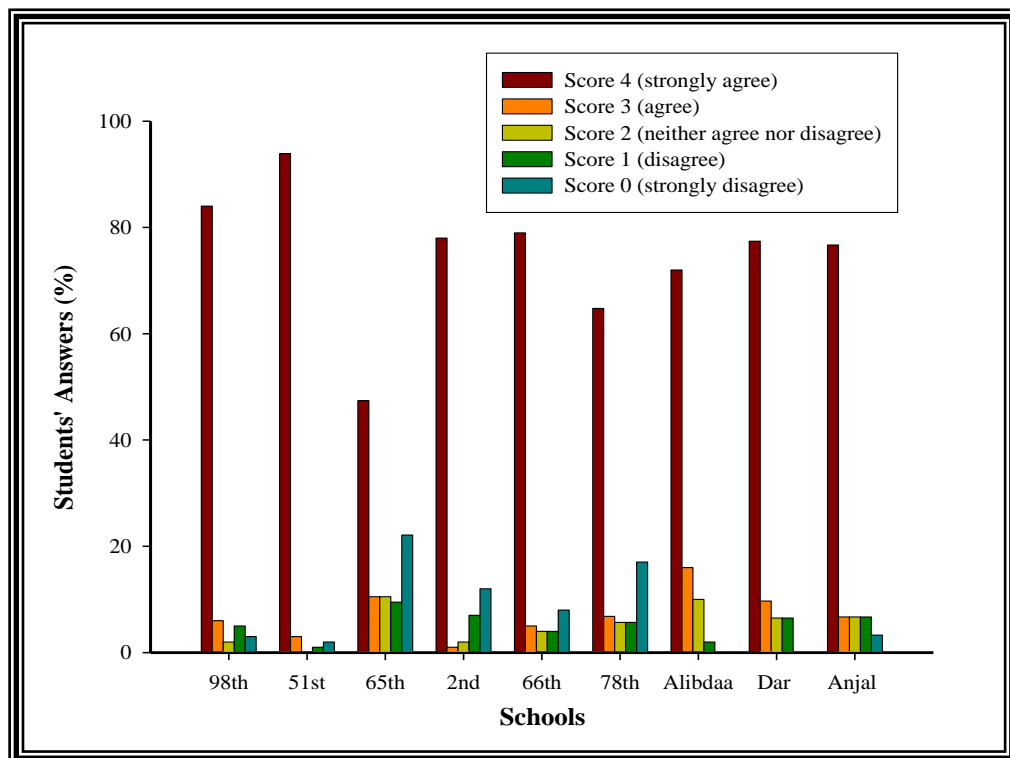
Figure 4. 35: Individual Schools' Assessment of the Importance of the Sink in the Art Classroom

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All selected public schools had no sink in their art classrooms except fifth school 66th which was had a sink, but this was not in use as it was covered with a great deal of artwork which prevented students free access to it. They used the general school sinks which were away from the art classroom. Therefore, some students felt it disrupted their lesson time by having to go out and to clean their tools and hands. For example, 'what did the teacher say while I was away?' In addition, it was a waste of time of the art lesson, and disturbed other classes.

The seventh school Alibdaa and eighth school Dar Alhanan only had one sink in their art classroom. This caused student bunching and crowded this area at the end of sessions as students simultaneously attempted to access this facility at the same time. On the other hand, the ninth school Anjal Albasateen had no sink.

My observations and interviews concurred that a sink is considered one of the art classrooms most important facilities in encouraging students to try new things. By this I mean, as it allowed students to clean their hands and tools and keep the classroom clean so that other new techniques and materials could be tried out. However, in some schools, students could only access sinks by leaving the classroom in order to use a communal sink. This arguably impoverished their learning process for a number of reasons: firstly and the most significant being that they became reluctant to clean their tools, such as brushes and palettes, because the sinks were so far from the classroom and this was seen to affect their work negatively because they tended to over-use one media instead of cleaning their tools and trying another; and secondly, this process of having students continually leaving the classroom led to students missing beneficial information whilst they were not present, wasting art session time.

I observed that having more sinks lessened the need for students to crowd around a single washing facility; which caused mess as students all tried to use it at the same time, often splashing water on the floor. This concentration of students in a single part of the room created excessive noise, and often resulted in a queue being formed in order to use the sink; wasting valuable lesson time. Conversely, a positive effect that arose from students congregating around a central sink was being able to observe the different materials their colleagues were using; and this potentially aroused their curiosity and instigated a discussion which encouraged them to try new things in

their tasks. Furthermore, as the sink is an important place within the room, the teacher was able to use this area to display some materials that encouraged exploration in the students' practices.

The fourteenth item on the questionnaire asked students whether they found the art classroom generally supportive of their 'trying new things'.

14. Generally, I find the art classroom supportive of trying new things in art tasks.

Table 4.15 summarises students' responses to this statement. Figures 4.36 and 4.37 also show their answers to this question.

Table 4. 15: Students' Assessment of the Supportiveness of the Art Classroom in Trying New Things

School	Strongly agree		Agree		Neither agree nor disagree		Disagree		Strongly disagree		Total	
	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)
98th	6	6.0	9	9.0	55	55.0	20	20.0	10	10.0	100	100
51st	24	24.2	17	17.2	26	26.3	18	18.2	14	14.1	99	100
65th	9	9.5	17	17.9	40	42.1	23	24.2	6	6.3	95	100
2nd	26	26.0	29	29.0	16	16.0	7	7.0	22	22.0	100	100
66th	34	34.0	23	23.0	23	23.0	11	11.0	9	9.0	100	100
78th	33	37.5	29	33.0	11	12.5	14	15.9	1	1.1	88	100
Alibdaa	13	26.0	10	20.0	10	20.0	12	24.0	5	10.0	50	100
Dar	30	32.3	17	18.3	26	28.0	9	9.7	11	11.8	93	100
Anjal	7	23.3	9	30.0	11	36.7	1	3.3	2	6.7	30	100
Total	182	24.1	160	21.2	218	28.9	115	15.2	80	10.6	755	100
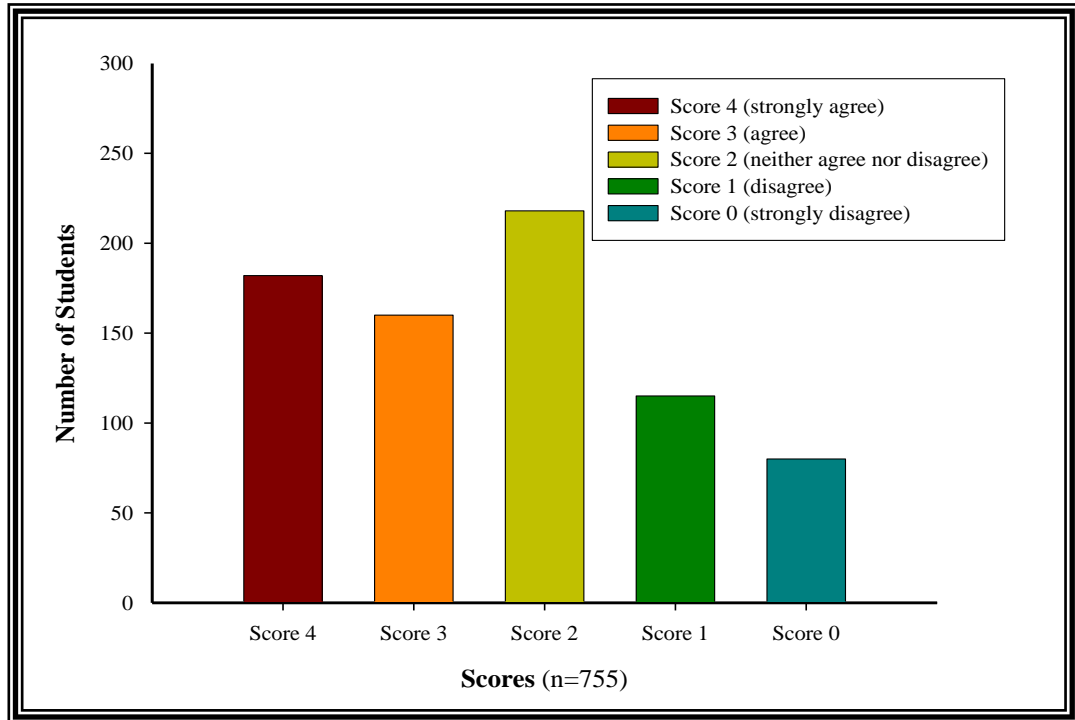
Figure 4. 36: Overall Assessment of the Supportiveness of the Art Classroom in Trying New Things
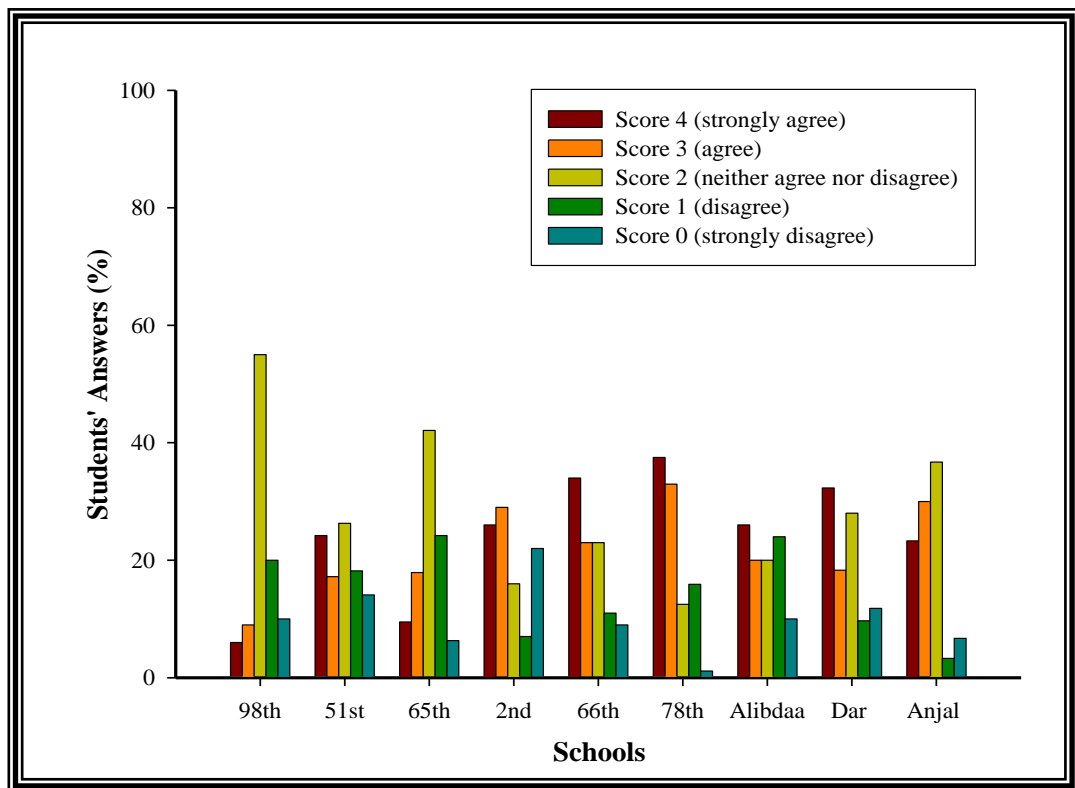
Figure 4. 37: Individual Schools' Assessment of the Supportiveness of the Art Classroom in Trying New Things

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Overall student response to this question showed a preference toward the agreement side with more students 'strongly agreed' (24.1%) than agreed (21.2%) that they find their art classroom supportive of trying new things in art tasks. This is possibly owing to the distinguishing factors in their art classroom environment. Therefore, some students felt the presence of different factors in art classroom environment were supportive. The highest overall score was 'neither agreed nor disagreed' (28.9%); this arguably indicated that some students found that still there were missing or shortages of some factors within their art classroom environment.

The fifteenth question sought students' views on whether the art curriculum encouraged them to try new things in art tasks.

15. The art curriculum helps me to try new things in art tasks.

Table 4.16 summarises students' views on whether the art curriculum helped them to try new things in art tasks. Figures 4.38 and 4.39 also illustrate students' responses to this item.

Table 4. 16: Students' Assessment of the Degree to Which the Art Curriculum Helped Them to Try New Things in Art Tasks

School	Strongly agree		Agree		Neither agree nor disagree		Disagree		Strongly disagree		Total	
	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)
98th	10	10.0	27	27.0	32	32.0	15	15.0	16	16.0	100	100
51st	5	5.1	15	15.2	27	27.3	19	19.2	33	33.3	99	100
65th	8	8.4	17	17.9	13	13.7	19	20.0	38	40.0	95	100
2nd	15	15.0	8	8.0	46	46.0	19	19.0	12	12.0	100	100
66th	26	26.0	10	10.0	26	26.0	17	17.0	21	21.0	100	100
78th	33	37.5	18	20.5	19	21.6	11	12.5	7	8.0	88	100
Alibdaa	15	30.0	9	18.0	11	22.0	5	10.0	10	20.0	50	100
Dar	18	19.4	19	20.4	27	29.0	14	15.1	15	16.1	93	100
Anjal	8	26.7	4	13.3	9	30.0	7	23.3	2	6.7	30	100
Total	138	18.3	127	16.8	210	27.8	126	16.7	154	20.4	755	100
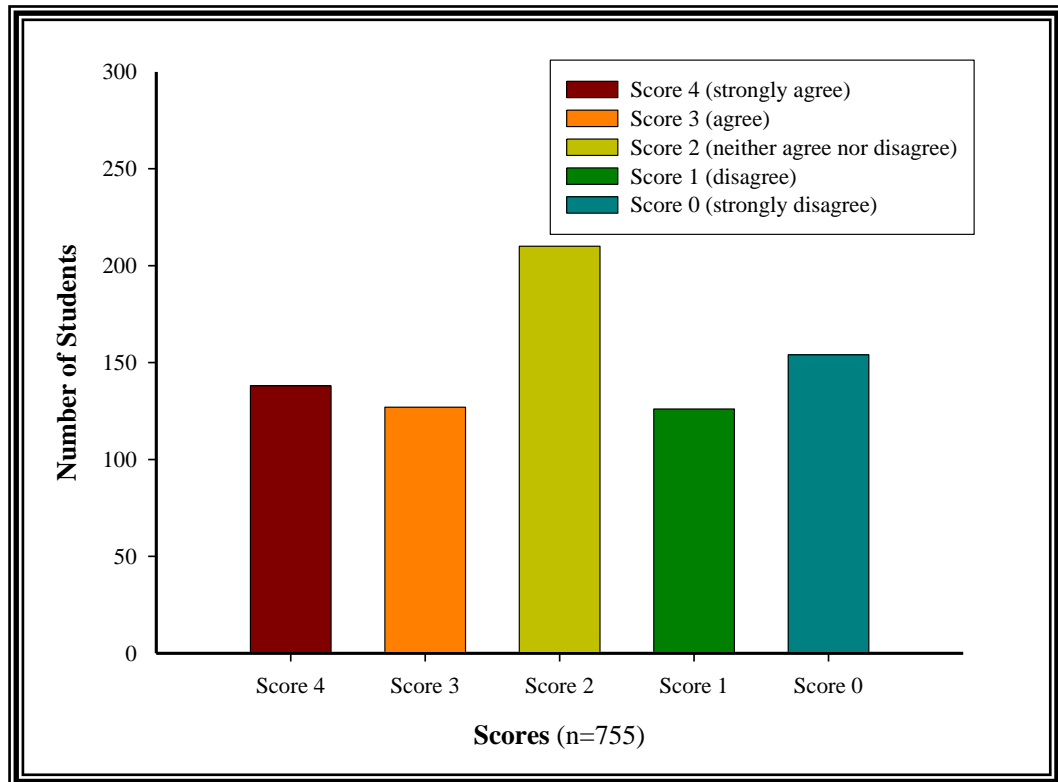
Figure 4. 38: Overall Assessment of the Art Curriculum
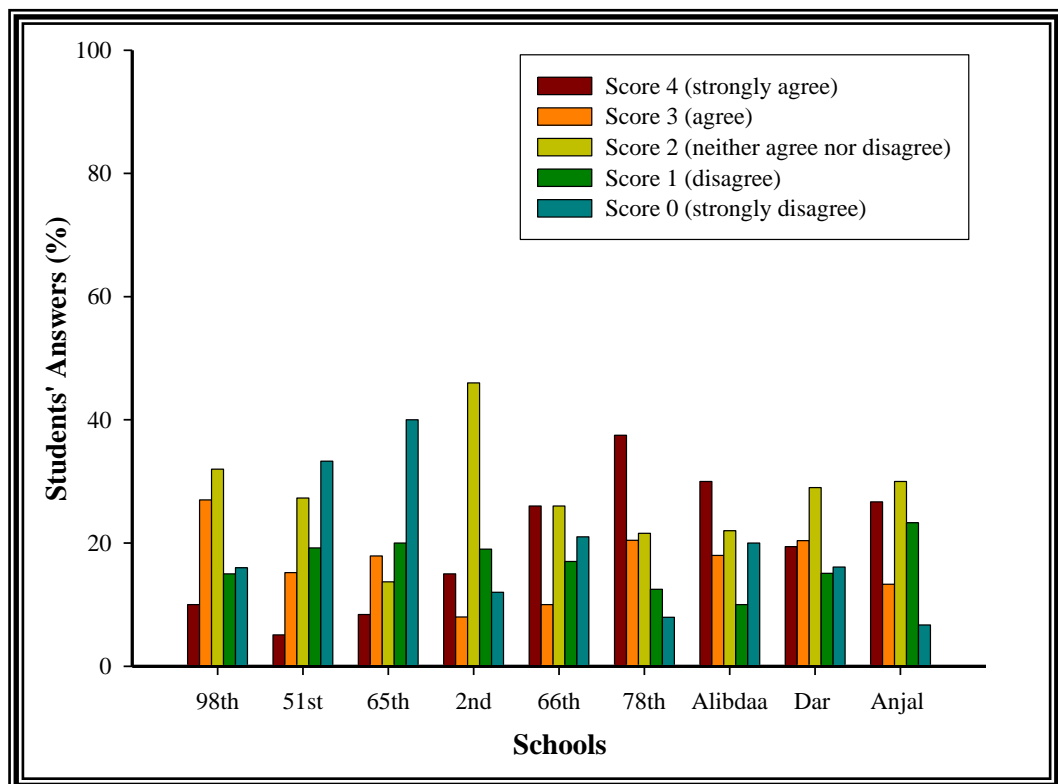
Figure 4. 39: Individual Schools' Assessment of the Art Curriculum

Overall students' replies to this question showed a preference toward the disagreement side where a number of students were 'strongly disagreed' (20.4%), less were 'disagreed' (16.7%). The highest overall score was for the response 'neither agreed nor disagreed' (27.8%) that the art curriculum helped them to try new things in art tasks.

The sixteenth questionnaire item elicited students' responses concerning the availability and usefulness of art tools and materials.

16. *The provision of tools and materials helps me to try new things in art tasks.*

Table 4.17 represents students' evaluations of the availability and usefulness of art tools and materials in trying new things in art tasks. Figures 4.40 and 4.41 also delineate the responses to this item.

Table 4. 17: Students' Assessment of the Usefulness of Art Tools and Materials in Helping Them Try New Things

School	Strongly agree		Agree		Neither agree nor disagree		Disagree		Strongly disagree		Total	
	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)
98th	73	73.0	12	12.0	9	9.0	0	0.0	6	6.0	100	100
51st	61	61.6	24	24.2	10	10.1	1	1.0	3	3.0	99	100
65th	49	51.6	16	16.8	13	13.7	15	15.8	2	2.1	95	100
2nd	56	56.0	10	10.0	13	13.0	10	10.0	11	11.0	100	100
66th	51	51.0	23	23.0	15	15.0	3	3.0	8	8.0	100	100
78th	38	43.2	26	29.5	12	13.6	8	9.1	4	4.5	88	100
Alibdaa	32	64.0	9	18.0	4	8.0	4	8.0	1	2.0	50	100
Dar	39	41.9	28	30.1	21	22.6	2	2.2	3	3.2	93	100
Anjal	14	46.7	9	30.0	6	20.0	1	3.3	0	0.0	30	100
Total	413	54.7	157	20.8	103	13.6	44	5.8	38	5.0	755	100
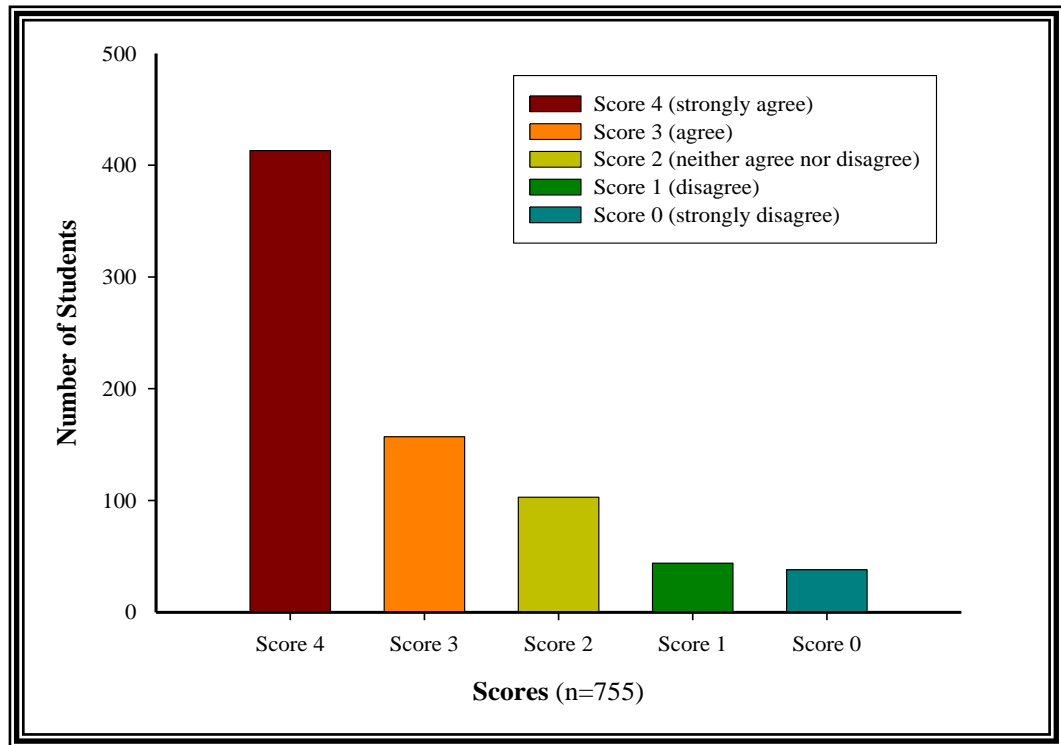
Figure 4. 40: Overall Assessment of the Usefulness of Art Tools and Materials in the Trying of New Things
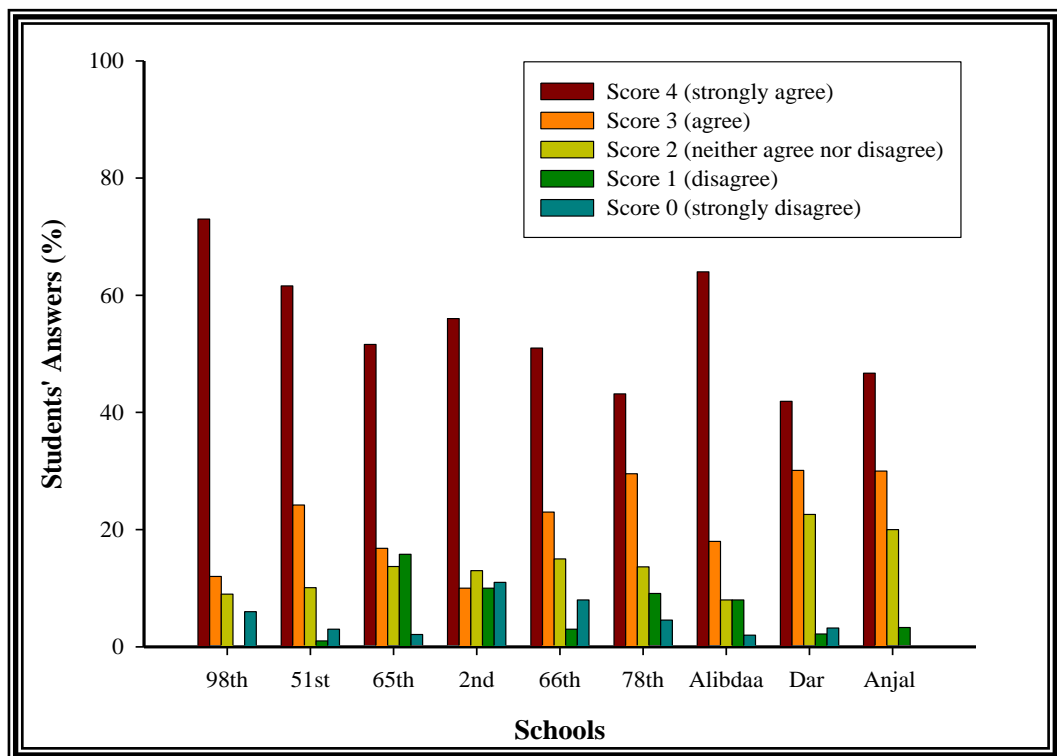
Figure 4. 41: Individual Schools' Assessment of the Usefulness of Art Tools and Materials in the Trying of New Things

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Overall students' replies to this question showed a preference toward the agreement side where over half of students were 'strongly agreed'(54.7%) and less students 'agreed' (20.8%) that art tools and materials are important in the trying of new things. The responses concurred with observations that materials were important. Material purchased by students were of different qualities, some of unknown origin and this arguably increased possibility of error for both students and other people in the classroom as a result of lack of student experience with these materials. Additionally, some students, due to economic factors, could not afford the expensive materials, which arguably affected their interest in art and maybe reflected in their ability to complete or not complete art tasks. In the private schools, the materials were supplied and a greater range of tools were available (this was very evident when observing the public schools) which for the private school students facilitated the variety of the creative results through the techniques learned. It is important therefore, that the teacher should offer different types of materials and tools to allow students to explore different results and to be more creative.

The seventeenth question asked students whether the awarding of marks encouraged them to try new things.

17. Marks encourage me to try new things in art tasks.

Table 4.18 represents students' responses to this item. They are also summarised in Figures 4.42 and 4.43.

Table 4. 18: Students' Assessment of the Importance of Marks in Encouraging Them to Try New Things

School	Strongly agree		Agree		Neither agree nor disagree		Disagree		Strongly disagree		Total	
	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)
98th	74	74.0	9	9.0	10	10.0	2	2.0	5	5.0	100	100
51st	86	86.9	7	7.1	5	5.1	0	0.0	1	1.0	99	100
65th	61	64.2	16	16.8	15	15.8	2	2.1	1	1.1	95	100
2nd	68	68.0	6	6.0	14	14.0	3	3.0	9	9.0	100	100
66th	71	71.0	12	12.0	7	7.0	3	3.0	7	7.0	100	100
78th	54	61.4	17	19.3	9	10.2	3	3.4	5	5.7	88	100
Alibdaa	30	60.0	8	16.0	4	8.0	5	10.0	3	6.0	50	100
Dar	59	63.4	18	19.4	9	9.7	5	5.4	2	2.2	93	100
Anjal	20	66.7	7	23.3	2	6.7	0	0.0	1	3.3	30	100
Total	523	69.3	100	13.2	75	9.9	23	3.0	34	4.5	755	100
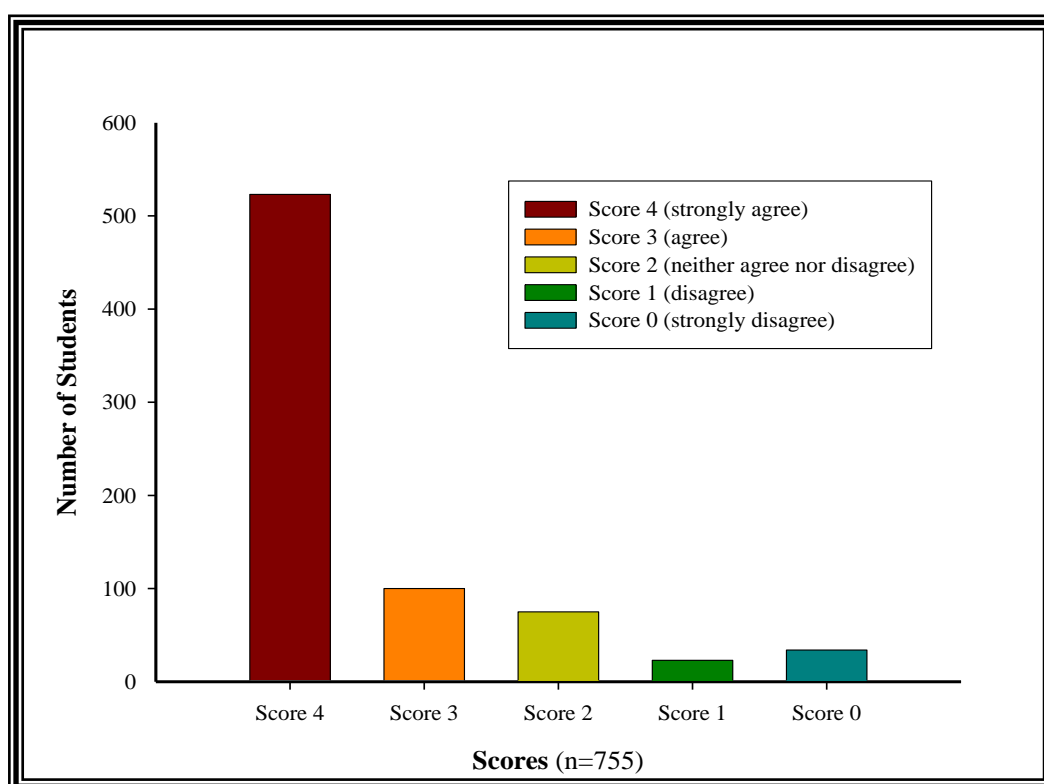
Figure 4. 42: Overall Assessment of the Importance of Marks in Encouraging the Trying of New Things

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Figure 4. 43: Individual Schools' Assessment of the Importance of Marks in Encouraging the Trying of New Things

Students' responses to this question revealed that in all schools, a high percentage of students 'strongly agreed' (69.3%) that marks encourage them to try new things in art tasks.

Art subject marks are involved in providing the students' grade point average (GPA) score; therefore, students take it as a challenge to get the highest marks in their art subject. In addition, this will likely encourage students to explore and try new things in art; also, students want to satisfy their teacher to avoid a reduction of marks so they will try to be more creative to avoid teacher dissatisfaction.

The eighteenth questionnaire item elicited students' responses to the proposition that positive teacher behaviour encouraged them to try new things in art tasks.

18. Positive teacher behaviour encourages me to try new things in art tasks.

Table 4.19 summarises students' responses concerning the influence of positive teacher behaviour. Figures 4.44 and 4.45 also provide a visual summary of the question.

Table 4. 19: Students' Assessment of the Influence of Positive Teacher Behaviour in Trying New Things

School	Strongly agree		Agree		Neither agree nor disagree		Disagree		Strongly disagree		Total	
	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)
98th	59	59.0	17	17.0	13	13.0	8	8.0	3	3.0	100	100
51st	69	69.7	15	15.2	11	11.1	4	4.0	0	0.0	99	100
65th	33	34.7	17	17.9	17	17.9	13	13.7	15	15.8	95	100
2nd	63	63.0	5	5.0	9	9.0	11	11.0	12	12.0	100	100
66th	58	58.0	13	13.0	20	20.0	4	4.0	5	5.0	100	100
78th	49	55.7	14	15.9	9	10.2	6	6.8	10	11.4	88	100
Alibdaa	23	46.0	14	28.0	8	16.0	4	8.0	1	2.0	50	100
Dar	54	58.1	15	16.1	14	15.1	8	8.6	2	2.2	93	100
Anjal	21	70.0	6	20.0	2	6.7	0	0.0	1	3.3	30	100
Total	429	56.8	116	15.4	103	13.6	58	7.7	49	6.5	755	100
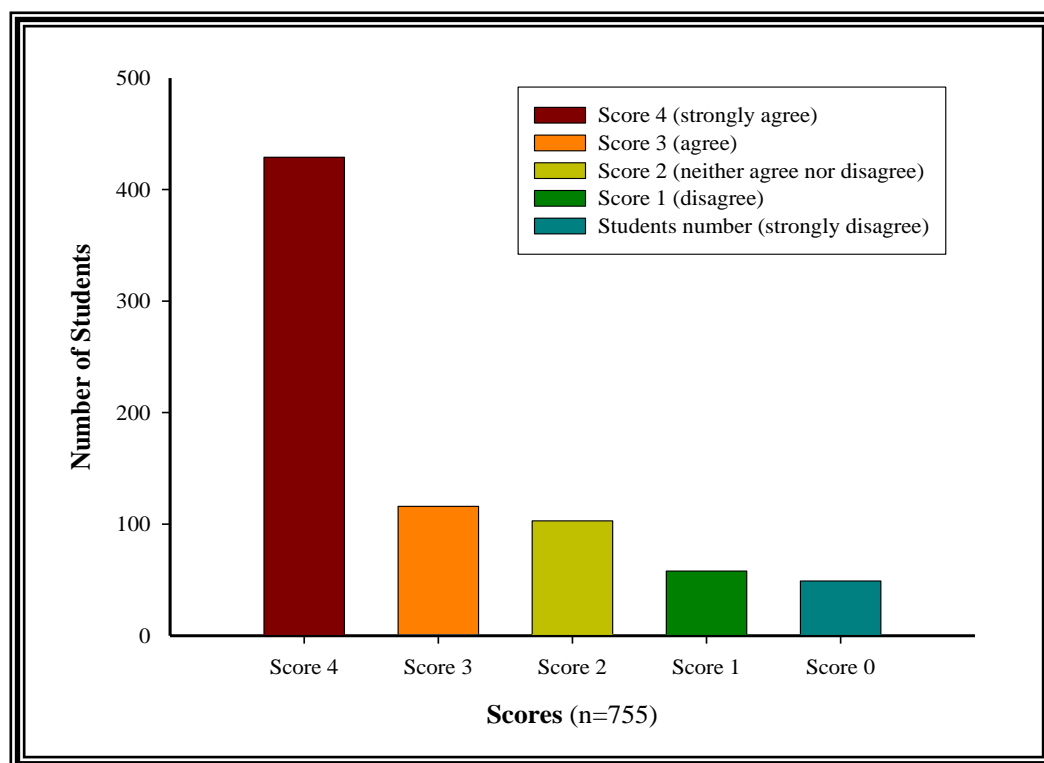
Figure 4. 44: Overall Assessment of the Influence of Positive Teacher Behaviour in Trying New Things
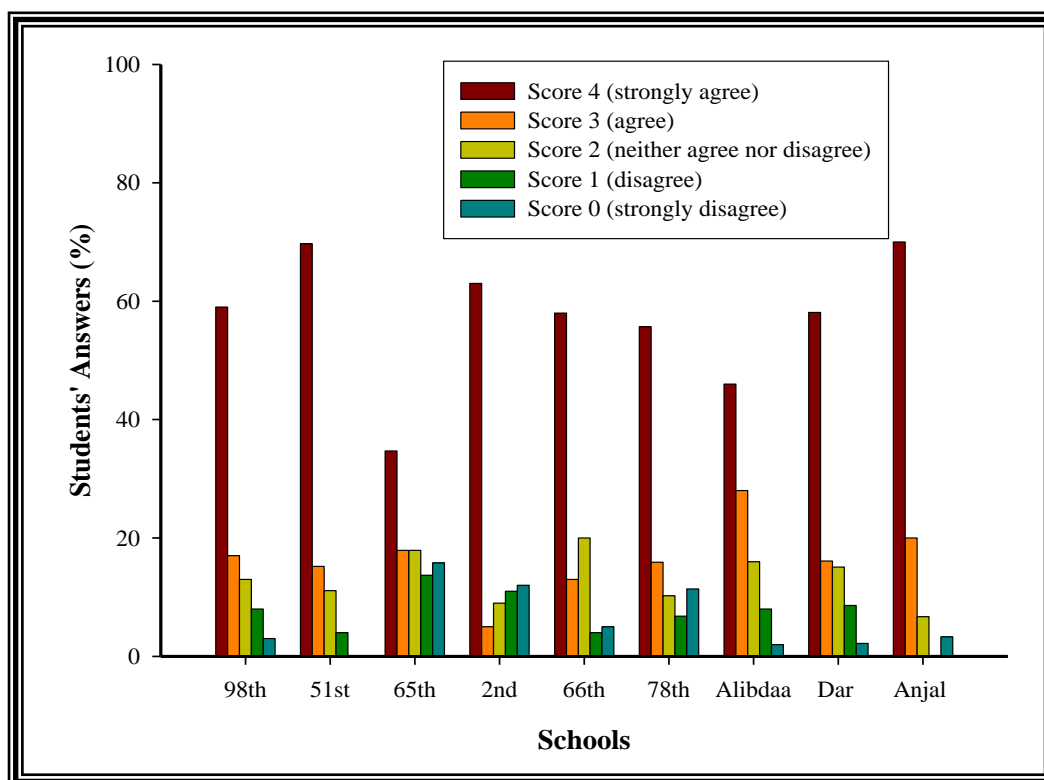
Figure 4. 45: Individual Schools' Assessment of the Influence of Positive Teacher Behaviour in Trying New Things

The results obtained from this question showed that a percentage of students in all schools 'strongly agreed' that the positive teacher behaviour such as effective communication and interaction utilised positive reinforcement with students. This encouraged the students to try new things in art tasks with a high average overall score for 'strongly agreed' (56.8%).

The nineteenth question concerned students' views on the use of technology in encouraging them to try new things.

19. The use of technology encourages me to try new things in art tasks.

Table 4.20 represents students' responses concerning the role of technology in encouraging them to try new things in art tasks. Their answers are also illustrated in Figures 4.46 and 4.47.

Table 4. 20: Students' Assessment of the Use of Technology in Encouraging Them to Try New Things

School	Strongly agree		Agree		Neither agree nor disagree		Disagree		Strongly disagree		Total	
	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)
98th	78	78.0	9	9.0	8	8.0	2	2.0	3	3.0	100	100
51st	86	86.9	8	8.1	2	2.0	0	0.0	3	3.0	99	100
65th	65	68.4	11	11.6	6	6.3	9	9.5	4	4.2	95	100
2nd	71	71.0	11	11.0	14	14.0	4	4.0	0	0.0	100	100
66th	61	61.0	18	18.0	15	15.0	2	2.0	4	4.0	100	100
78th	38	43.2	32	36.4	12	13.6	5	5.7	1	1.1	88	100
Alibdaa	31	62.0	9	18.0	8	16.0	2	4.0	0	0.0	50	100
Dar	47	50.5	22	23.7	10	10.8	7	7.5	7	7.5	93	100
Anjal	17	56.7	8	26.7	4	13.3	1	3.3	0	0.0	30	100
Total	494	65.4	128	17.0	79	10.5	32	4.2	22	2.9	755	100
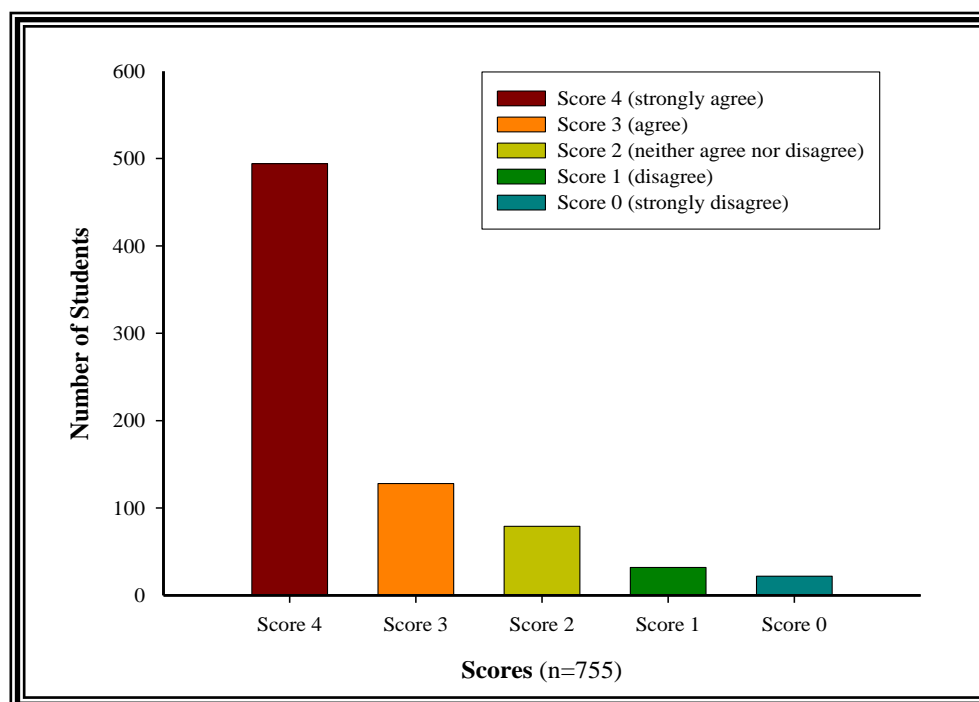
Figure 4. 46: Overall Assessment of the Use of Technology in Trying New Things

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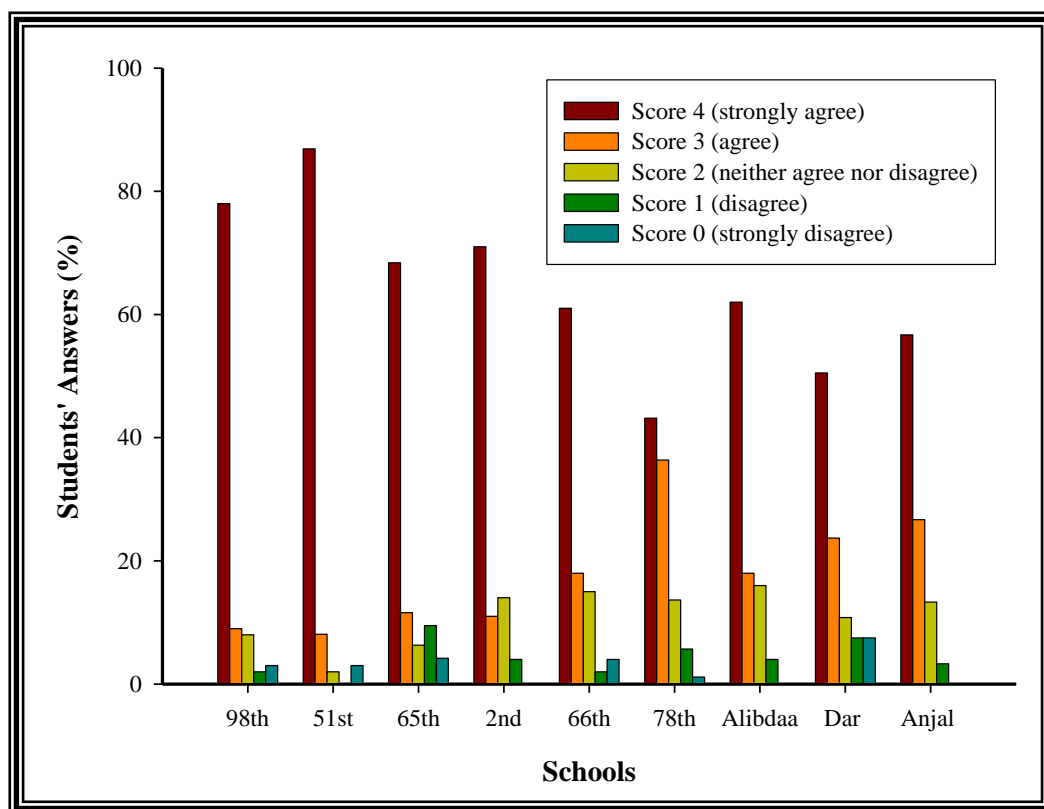
Figure 4. 47: Individual Schools' Assessment of the Use of Technology in the Trying of New Things

Student response to this question revealed that a high percentage of students in all schools 'strongly agreed' with a high average overall score (65.4%) that the use of technology (either a teacher using it to explain a topic or a student using it to complete their work) encourages them to try new things in art tasks. This concurred with my observations of technology use in the selected private schools during the art classes which were noted to increase students' excitement and aid in understanding of the explanation of the topic.

The twentieth questionnaire item concerned the use of art related library books in encouraging students to try new things in art tasks.

20. The use of library books in our art classroom encourages me to try new things.

Table 4.21 summarises students' ratings of the use of library books in encouraging them to try new things. Their answers are also depicted in Figures 4.48 and 4.49.

Table 4. 21: Students' Assessment of the Use of Library Books in Encouraging Them to Try New Things

| School	Strongly agree		Agree		Neither agree nor disagree		Disagree		Strongly disagree		Total	
	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)
98th	64	64.0	19	19.0	9	9.0	5	5.0	3	3.0	100	100
51st	58	58.6	16	16.2	15	15.2	8	8.1	2	2.0	99	100
65th	21	22.1	11	11.6	19	20.0	13	13.7	31	32.6	95	100
2nd	71	71.0	11	11.0	14	14.0	4	4.0	0	0.0	100	100
66th	39	39.0	14	14.0	14	14.0	9	9.0	24	24.0	100	100
78th	38	43.2	14	15.9	12	13.6	9	10.2	15	17.0	88	100
Alibdaa	21	42.0	11	22.0	8	16.0	1	2.0	9	18.0	50	100
Dar	40	43.0	26	28.0	11	11.8	8	8.6	8	8.6	93	100
Anjal	9	30.0	7	23.3	10	33.3	2	6.7	2	6.7	30	100
Total	361	47.8	129	17.1	112	14.8	59	7.8	94	12.5	755	100
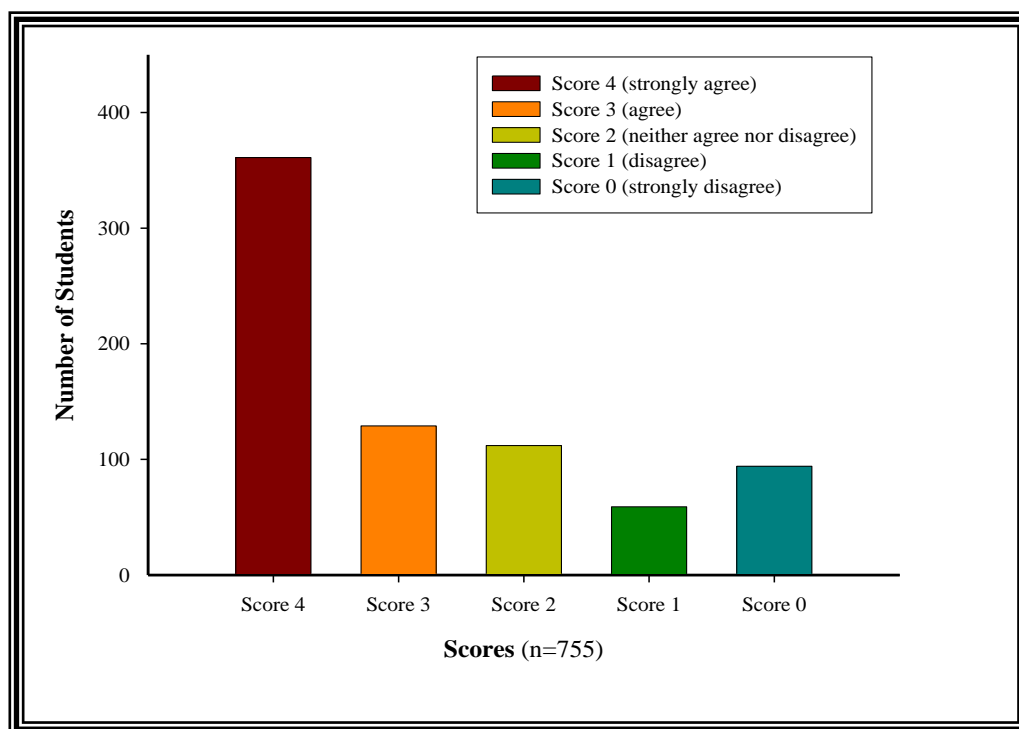
Figure 4. 48: Overall Assessment of the Use of Library Books in Encouraging the Trying of New Things
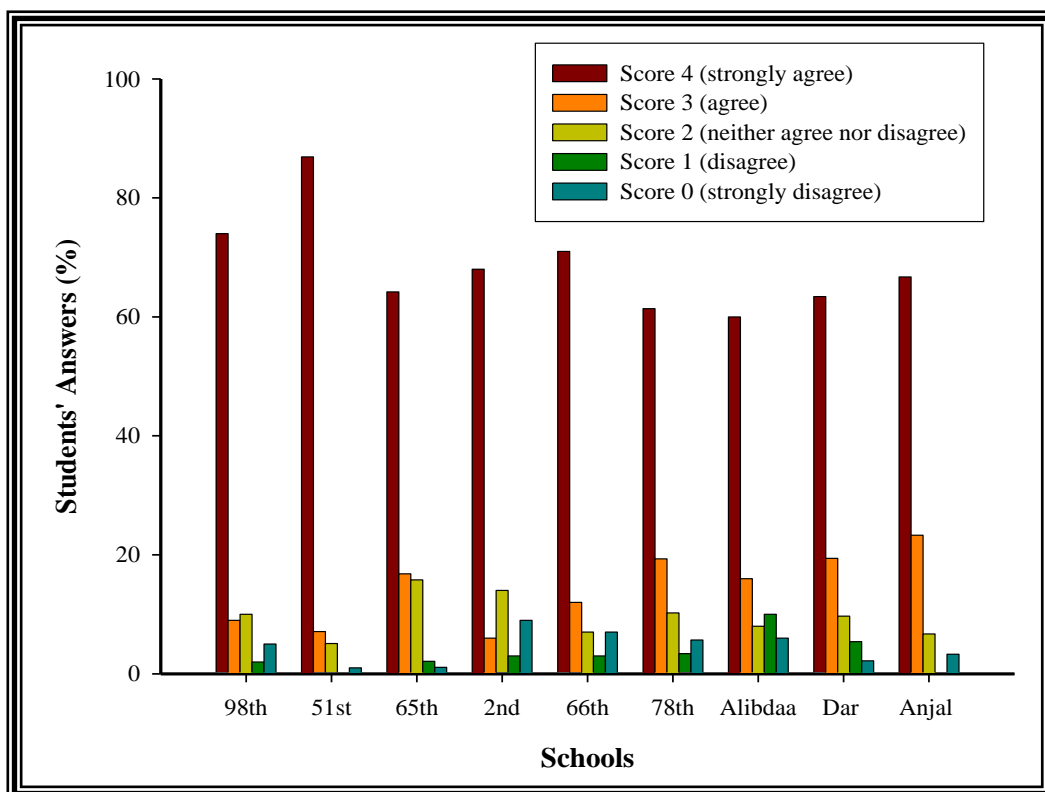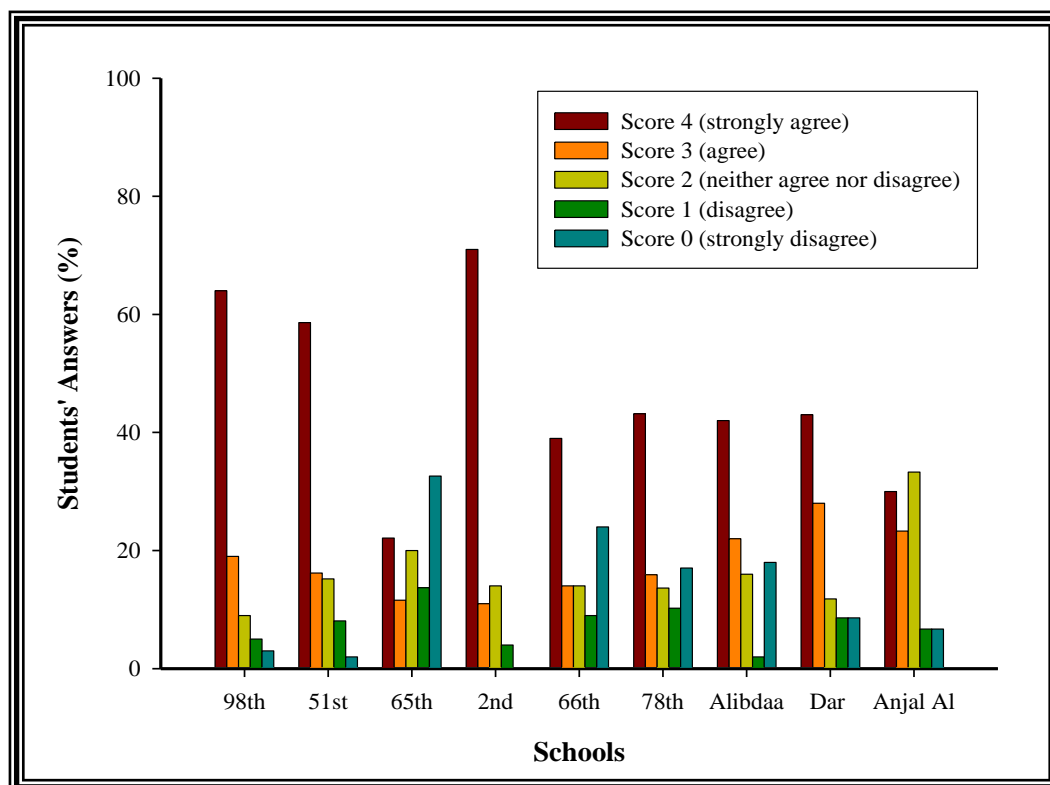
Figure 4. 49: Individual Schools' Assessment of the Use of Library Books in Encouraging the Trying of New Things

Overall student response to this question expressed a preference towards the agreement side where almost half of all students were 'strongly agreed' (47.8%) and other students 'agreed' (17.1%) that the use of library books in the art classroom encouraged them to try new things. In general, each school had a school library located in different locations within the school and it contained some general art books.

The last questionnaire type item providing a score was a statement that co-operation was one of the most important factors in encouraging students to try new things in art tasks.

21. Co-operation with other students is one of the most important factors in encouraging me to try new things.

Table 4.22 summarises students' responses concerning co-operation as a source of motivation in trying new things. Their answers are also depicted in Figures 4.50 and 4.51.

Table 4. 22: Students' Assessment of Co-operation with Other Students as a
Motivating Factor in Trying New Things

School	Strongly agree		Agree		Neither agree nor disagree		Disagree		Strongly disagree		Total	
	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)
98th	53	53.0	19	19.0	19	19.0	6	6.0	3	3.0	100	100
51st	68	68.7	12	12.1	13	13.1	1	1.0	5	5.1	99	100
65th	60	63.2	13	13.7	10	10.5	6	6.3	6	6.3	95	100
2nd	80	80.0	9	9.0	4	4.0	3	3.0	4	4.0	100	100
66th	57	57.0	22	22.0	13	13.0	2	2.0	6	6.0	100	100
78th	67	76.1	11	12.5	5	5.7	3	3.4	2	2.3	88	100
Alibdaa	30	60.0	9	18.0	8	16.0	1	2.0	2	4.0	50	100
Dar	62	66.7	17	18.3	8	8.6	3	3.2	3	3.2	93	100
Anjal	26	86.7	0	0.0	3	10.0	0	0.0	1	3.3	30	100
Total	503	66.6	112	14.8	83	11.0	25	3.3	32	4.2	755	100
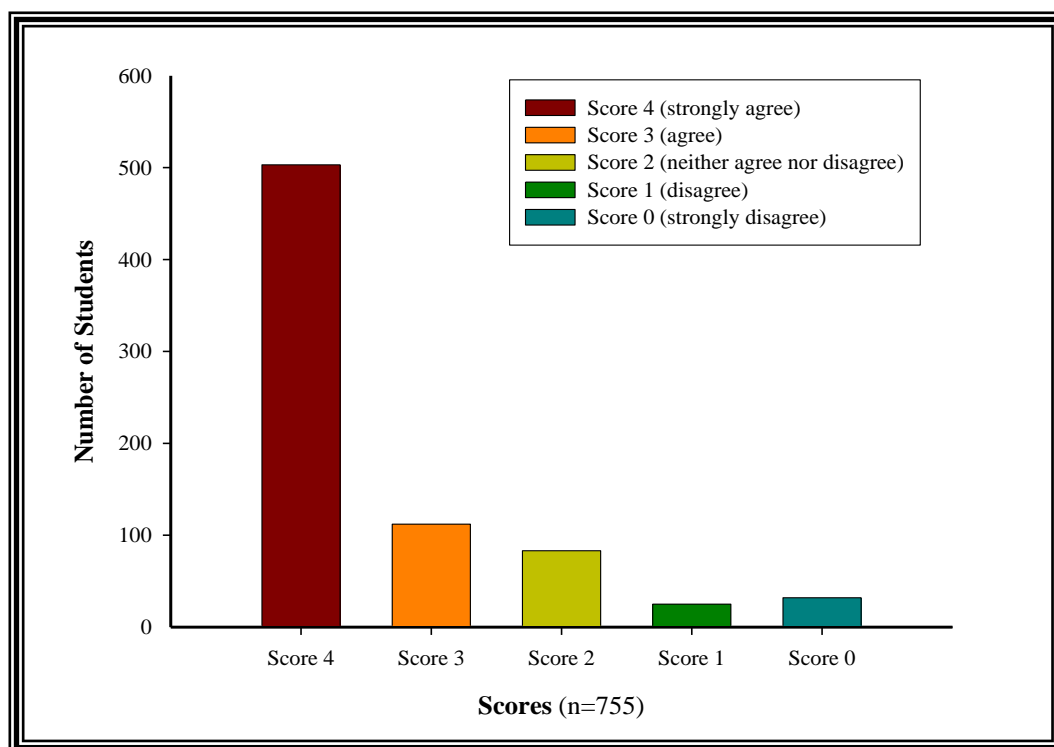
Figure 4. 50: Overall Assessment of Co-operation with Other Students as a
Motivating Factor in Trying New Things
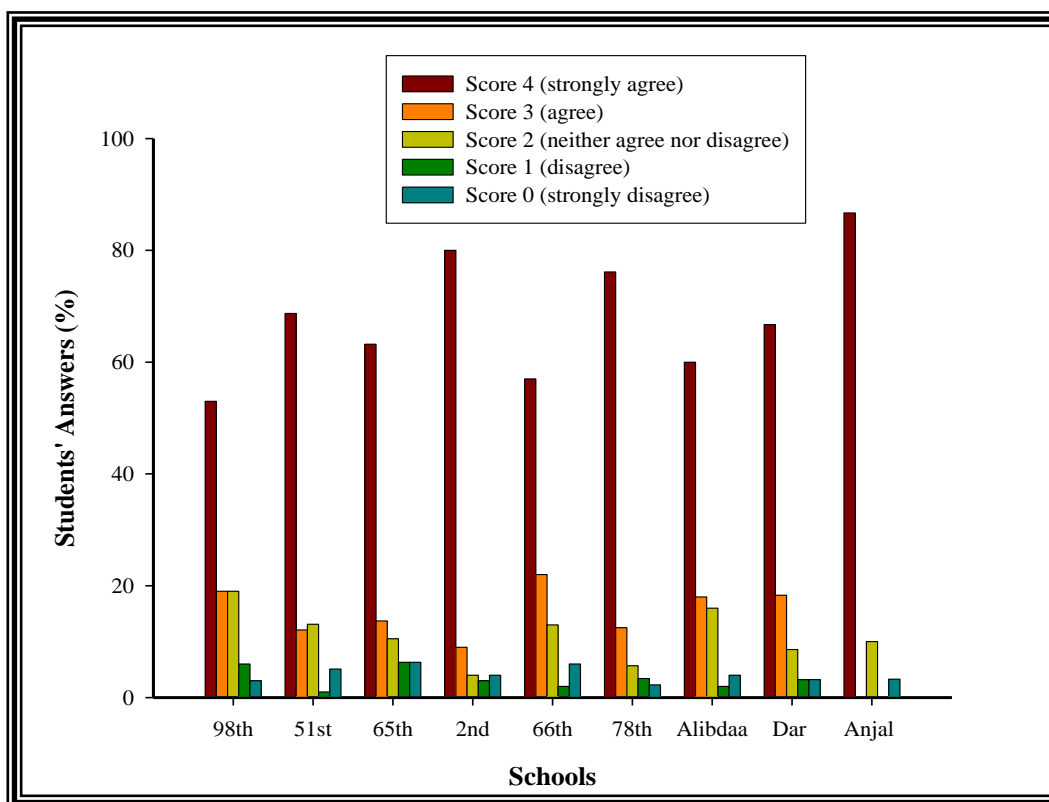
Figure 4. 51: Individual Schools' Assessment of Co-operation with Other Students as a Motivating Factor in Trying New Things

The overall responses of students for this question revealed that 66.6% of all students were 'strongly agreed' and 14.8% of students 'agreed' that co-operation with other students is one of the most important factors in encouraging them to try new things. From my observations of schools in Jeddah, I found that there was a limitation of co-operation between students mostly owing to the existing arrangement of the layout.

The final item on the questionnaire was an open-ended and optional question regarding the types of facilities needed to encourage creativity.

22. What are the most important facilities that you need in your art classroom to help you try new things and to be more creative?

Responses to this question showed that a high proportion of public schools' students need more space, furniture suitable for the art classroom for example sink(s), materials, and tools. Students from the first, second and fourth schools the 98th, 51st and 2nd asked to have their own non-shared art classroom. Private school students had fewer complaints than public schools, with the most common issue being a need

for more tools, materials, and space in order to try new things within the art classroom (Appendix 8).

4.4.1 Overview of Questionnaire

The data obtained from the questionnaire, indicated that factors within the art classroom environment were viewed to varying degrees as important for students trying new things for creative thinking and in support of critical thinking. In summary, the students' majority responses were as follows: they liked art as a subject; and preferred to take their art lesson in a dedicated art classroom as opposed to a general classroom; they reported that ventilation was poor and so not creating a good learning environment; and similarly heat had a negative effect; however, lighting was good; but then the noise in the art classroom was bad; the location of the art classroom was considered to be suitable; but the furniture and its layout was not considered suitable; the work displays had not been considered inspiring; and the colour of the room was not considered to help concentration; however, a sink, library, and use of technology were all considered to be a important facilities in the art classroom; also provision of suitable tools and materials was important; as was positive teacher behaviour; and the encouragement that marks provide; and the support of student co-operation.

Some of these factors scored more highly than others and the data revealed that furniture and layout were the top two followed by display and colour, a further two were design and curriculum, see Figure 4.52. The questionnaire has contributed to the understanding of these factors and provided a detailed student response. Question 22 was open-ended and this provided new information that the students considered important and helped towards a greater understanding of this research. After analysing the results of the questionnaire which generated results similar to the observations and interview results, it was noted that most of the perceptions recorded related to creativity, for example, the risk-taking often related to trying new things which is a creative practice. It was therefore decided that the focus of the main intervention study should be on perceptions of creative thinking and practices.

Figure 4. 52: Student Ranking of Importance of Classroom Factors
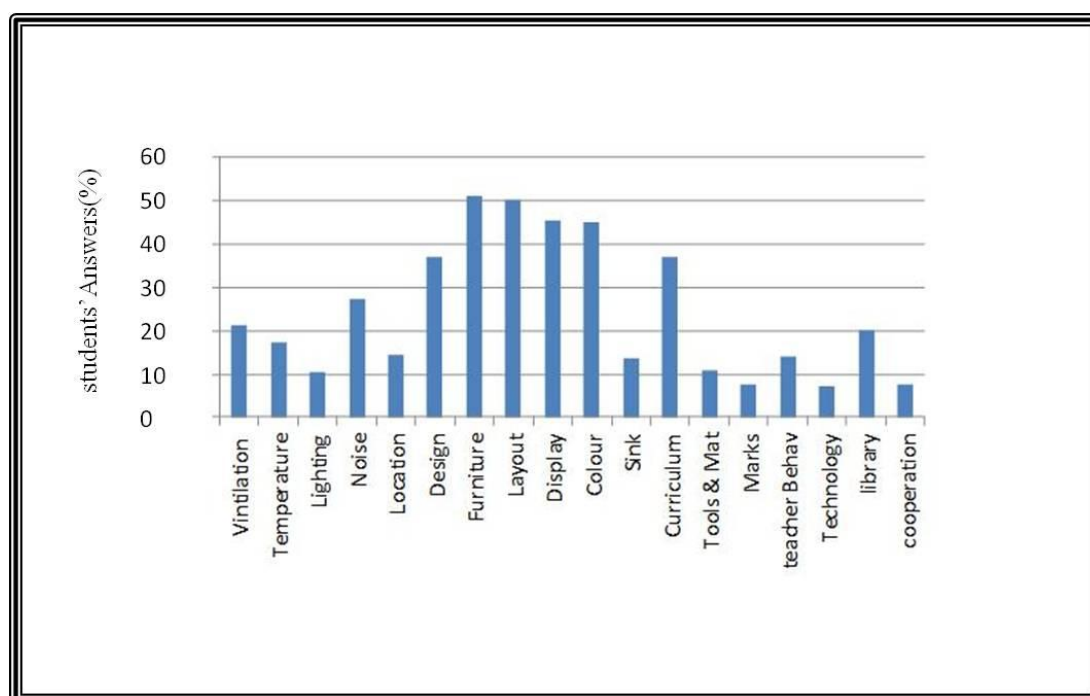
4.5 Criteria Used to Choose the Independent Variables

This section focuses on testing the applicable changes to the learning environment in Jeddah's intermediate girls' schools. From the data that was gathered by the observations, interviews and questionnaires, as well as from the literature review, there were many changes that arguably would be beneficial if applied to these schools. The ranking of factors revealed that some of the classroom factors scored more highly than others. The data revealed that furniture and layout were the top two followed by display and colour. The next two ranked factors were design and curriculum. Effective changes considered included reducing the number of students in each class, adjusting the size of the physical learning environment, the addition of improved ventilation systems and enhanced facilities such as an IT suite, additional sinks and washing facilities, additional art related books and the provision of student specific and ergonomic furniture. However, within the constraints of legal requirements e.g. MoE student number guidelines, administrative processes i.e. the inability to bring in outside IT without authorisation, financial limits e.g. the schools and I lacked the financial support to make changes like buying new furniture, and the

time available to conduct and complete my research in Saudi Arabia influenced the selection the most appropriate of conditions to manipulate.

Martin in 2002 refers to a 'hierarchy of designability' which measures the degree of control that teachers have over the physical elements of the classroom setting. Architectural elements have been classified in terms of hard (fixed features) and semi-fixed, semi-flexible and flexible features (Martin, 2002, p.143). This means that some parts of the classroom environment are easier to move and manipulate than others. This will affect the variables studied in this study. Due to the above reasons and the ranking of factors from the pre-implementation study I chose to make the changes to the classroom layout and display. The independent variables in this study were the table and seating arrangement and wall displays whilst the dependent variables were students' perceptions of the creative thinking and practices. These were applied in three interventional groups including; changes to table and seating arrangements (Group one), changes to wall displays (Group two), and changes to table and seating arrangements, and to wall displays (Group three). The reasons three groups were chosen, was to explore whether the manipulation of two variables simultaneously would increase the impact more than if I only manipulated one variable.

The implemented changes, name of schools involved in each change, the main reasons and the limitations in each group are summarised in Table 4.23.

Table 4. 23: Implemented intervention changes, for schools involved in each group, and reasons for selection

Change(s)	School name	Reasons	Limitation
Table and Seating Arrangements (group one)	51st Intermediate Girls' School	No personal space, limitation in discussions	I could not get permission to do display changes
	65th Intermediate Girls' School	No personal space, limitation in discussions, and restriction to teacher and students movement	
	Dar Alhanan Intermediate Girls' School	Students sat scattered, limitation in discussions	
Wall Displays (group two)	66th Intermediate Girls' School	Messy display	I could not get permission to do the table and seating arrangements
	78th Intermediate Girls' School	Limited displayed instructional materials while there were many artworks kept at the side of the class	No limitation
	Alibdaa Intermediate Girls' School	There was no display	Fixed layout
Table and Seating Arrangements and Wall Displays (group three)	98th Intermediate Girls' School	No personal space, limitation in discussions, restriction to teacher and students movement, and all display related to other subjects (sewing subject)	No limitation
	2nd Intermediate Girls' School	No personal space, limitation in discussions, and no display	
	Anjal Albasateen Intermediate Girls' School	Students sat scattered, limitation in discussion, and few works displayed	

4.6 Summary

This chapter has enabled a more focused approach to be defined through its broader review of the learning environment relationships, where it identified perceptions of the relationship between the environment in the art classroom and students' thinking and practices in girls' intermediate schools. The field observations, interviews and questionnaires identified factors across the selected schools in the cohort. The ranking of the questionnaire agreed with the findings from the interviews and observations. The basic model for visual analysis applied during the initial visits, was followed by observing specific categories and design elements within the classroom. A structured analysis was then made of the observations, interviews and questionnaires.

In overview of where the majority of the evidence lay, this pre-intervention study informed me that the main intervention study would benefit from focusing more specifically upon perceptions of creative thinking and practices, and that the variables for the main interventions should be table and seating arrangements, and wall display.

Chapter Five: Research Method of Intervention Study

5.1 Introduction

In each of the selected schools three year groups were observed in the pre-intervention study, then one class in each school was selected for the main intervention studies. Public school classes are set at 30 students while private school classes are limited to 15 students, and it was decided to involve a mix of groups from both public and private schools, because this would provide a more realistic sample of learning environments in Jeddah. The selected students were of the same academic level to ensure that the subject would be the same in each school. The comparative analysis of pre and post intervention studies would enable the degree of influence exerted by each manipulation to be determined. Other studies into the environment have effectively used this approach before. Marx *et al.,* (2000) investigated the influence of seating arrangement, not only on the quantity but also on the type of task related questions children ask. In addition, Leung and Fung (2005) studied the effectiveness of enhanced school facilities and the impacts of this enhancement on the learning behaviours of students. They administered a pre and post occupancy evaluation questionnaire to 750 primary students who had studied in both the old schoolhouses and the new Millennium Schoolhouses. Effective management of the environment and facilities was found to be one of the main factors for improving the learning behaviours of primary students in this study.

Because it was not acceptable to interfere with the teaching plans in the art classes it was not possible to run tests like the Torrance tests for creativity with the students. This was a deciding factor in focusing on perceptions of creative thinking and practices elicited from each intervention group through observation and the distribution of a questionnaire which together recorded changes in perceptions of creative thinking and practices after experiencing each condition.

5.2 Observation

The art teacher introduced me to the students as a student researcher in art classroom environments. This minimised the effect I might have had on the students' behaviour, as described in chapter 3, thus enabling them to react and behave in as

normal a manner as possible. Behaviour mapping was applied to the observations of each intervention group, before and after changes were made. This involved my sketching and annotation of activities onto prepared room layout diagrams, focusing on the key variables. The dependent variables, in this study were students' perceptions of the creative thinking and practices. These behavioural observations were to serve as support context to the findings of the questionnaires.

5.3 Questionnaire

In this main study a 5-point Likert-scale questionnaire was used to rate student perceptions of their art classroom. Statistical analysis was then conducted on the pre and post intervention data using SPSS software. More specifically, each set of questions was subjected to a Non-Parametric Wilcoxon Signed Ranks Statistical Test with a significance level of 5% and a critical region of plus or minus 1.96 for a two-tailed test(see 5.4 below).

The same questions were used in the intervention group in pre and post intervention to investigate whether the change of the table and seating arrangement or wall display might affect the students' perception for creative thinking and practice before and after the change within the art classroom. As part of this I investigated whether they liked the change and whether this altered students' perceptions of creative thinking and practices. The three key questions began with a general enquiry into preference of learning environment for art classes. While the wording of this question referred only to the preference for the art classroom, in translation to Arabic this was understood to mean 'rather than a standard classroom'. The next two questions related more specifically to the changes made to the learning environment, and the influence upon them trying new things.

The group interventions for each condition consisted of 75 students – 30 from each of the two public schools in this category, and 15 from a private school. These class sizes were the average for these school types. The intention of keeping class sizes the same for each condition sample was to enable statistical consistency of comparison.

5.3.1. Changes to Table and Seating Arrangements (Group One)

With consideration of the effects upon the energies of interaction being negative for sociofugal layouts like seating in lines, or horseshoes as curved lines, the aim was to use more positive energies of interaction provided by circular sociopetal grouping of chairs round tables. Sociopetal layouts were set up in three schools including: 51st Intermediate Girls' School, 65th Intermediate Girls' School, and Dar Alhanan Intermediate Girls' School. Before the tables in the classroom were rearranged, the three Likert-scale questionnaire items that were related to table arrangement were distributed to the students in this group. This process was then repeated after the tables in the classroom were rearranged. The three questions were as follows:

Question (1): I prefer to take art sessions in our art classroom.

Question (2): The layout of our art classroom helps me to try new things in art tasks.

Question (3): Generally, I find the art classroom supportive of trying new things in art tasks.

5.3.2 Changes to Wall Displays (Group 2)

This change was also made in three schools including: 66th Intermediate Girls' School, 78th Intermediate Girls' School, and Alibdaa Intermediate Girls' School. Before these changes were made, the questionnaire items that were related to changes in wall displays were distributed to the students in this group. This process was then repeated after the changes took place. These questions were as follows:

Question (1): I prefer to take art sessions in our art classroom.

Question (2): The work display in our art classroom inspires me to be more creative.

Question (3): Generally, I find the art classroom supportive of trying new things in art tasks.

5.3.3 Changes to Table and Seating Arrangements and Wall Displays (Group 3)

Like groups one and two, these changes were made in three schools including: 98th Intermediate Girls' School, 2nd Intermediate Girls' School, and Anjal Albasateen

Intermediate Girls' School. Before these changes were made, the questionnaire items relating to table and seating arrangements and wall displays were distributed to the students in this group. This process was then repeated after the changes had been introduced. The questions were as follows:

Question (1): I prefer to take art sessions in our art classroom.

Question (2): The layout of our art classroom helps me to try new things in art tasks.

Question (3): The work display in our classroom inspires me to be more creative.

Question (4): Generally, I find the art classroom supportive of trying new things in art tasks.

The purpose of this group was to determine whether the impact of making one change would be measurably different from making two changes, or whether it was simply experienced as a single change through students' responses to the questionnaire and observations.

5.4 Statistical Analysis

The Wilcoxon matched pairs test, a non-parametric test of difference, was used to compare two sets of Likert scores from the same participants. This test can be used when the investigation involves rated qualitative responses, from one point in time with another. In this test 'T' is the final calculation of the Wilcoxon statistic; it is the smaller sum of the ranks. In this statistical test the value of T is compared to a value from the Wilcoxon critical values table. The value of T needs to be equal to or less than the critical value. The critical value for testing significance is $\pm$ 1.96. The critical value is used to determine whether the observed value of T is significant. However, the value T is only used when the sample group is $\leq$ 30, if the sample group > 30 that value is referrer to as the Z value. The level of significance used in this study was 0.05 this is the standard significance level for this type of research (Bailey et al., 2009). In this test there is also reference to P values. The P value is a measure of the significance of the difference between two responses. This paired difference test was used to register experimental variability in the analysis of differences between before and after measurements.

5.5 Follow-Up Visit

Four months after the post intervention review follow-up visits were conducted with the schools that had participated. The reason for carrying out the follow-up visits at four months was to provide sufficient time for the changes to have established their influence, but to fit within the academic year of the interventions, i.e. not returning in the following academic year. The purpose of these visits was to observe the implications of the changes on students, teachers and facilities; to assess whether the changes made were incorporated permanently following the intervention period. This took the form of informal discussions with individual art teachers and school principals regarding the importance of constructing a 'best-practice' art classroom environment for students' creativity.

5.6 Summary

This chapter described the data collection methods that were used in the main intervention and post intervention review and analysis. The fieldwork was carried out in participating intermediate girls' schools (schools for 12-15 year olds) in Jeddah, Saudi Arabia. The sample was divided into three groups. These involved sociopetal changes to table and seating arrangement G1, changes to wall displays G2 and changes to table and seating arrangements and wall displays G3. Behaviour mapping was used to record students' interactions with each other and teacher and also classroom dynamics. The questionnaires focused the perceived changes that each group experienced. The following chapter describes the analysis of the data and a discussion of the findings.

Chapter Six: Action Research Material and Discussion

6.1 Introduction

This chapter presents the intervention groups results. The first section describes the observation technique of behaviour mapping (Appendix 9). The second section compares the results of the questions distributed to the three groups of pre and post interventions upon the art classroom environments. These interventions involved modifications to the following independent variables, to record influence upon students' perceptions of their creative thinking and practices:

- Group 1: Table and seating arrangements.
- Group 2: Wall displays.
- Group 3: Table and seating arrangements and wall displays.

The third section of this chapter will present feedback from the follow-up visits to the selected schools.

6.2 Observation

Observations identified a number of features within each class in each pre and post intervention group. Pre-intervention observations are summarised in the following section.

I observed that the space that was available to each individual was insufficient (this was true for most of the selected public schools) due to class size, layout, and high student numbers. This had led to overlapping and crowding; which arguably increased potential for belligerent behaviour of students. I observed expressions of frustration as students competed for space which affected their relationships, mood and class dynamic. Some students preferred to stand, or even to sit on the floor, which was a distraction and resulted in work not being completed. In addition, this increased the level of student noise which meant that students could not concentrate well. Furthermore, it was difficult to hear the teachers' explanations properly with regard to instructions and feedback and students potentially missed out required

information necessary to complete their tasks effectively. This in some situations caused them to ask the same questions repeatedly during the session because they did not hear the original explanation or instruction. Additionally, students did not move any furniture, they sat according to how the classroom layout was arranged (this was also true in some of the selected private schools). In one of the selected private schools Dar Alhanan, before interventions were made, students were seated in a scattered manner around the tables. Here only four students were seated at the central table and the rest of the students were seated at the side tables and this affected the discussion between students and with their teacher and limited interaction and communication.

I also observed that ineffective classroom layouts necessitated the use of teacher actions such as discipline and punishment as the teacher attempted to control the class and this was observed to affect the students' moods. This was reflected in the inhibition of student willingness to try anything new, instead attempting to following instructions without question. One instance was observed where two students were upset by a teacher reprimand and lost motivation to explore new ideas. One carried out what was required with only technical engagement, whilst the other actually refused to do anything more. It is important that teachers manage the classroom in a way that provides a friendly and supportive environment, especially in the case of students of 12-15 years old. As mentioned in chapter two, research suggests that punishment can have a negative effect on adult-student relationships and can lead to students avoiding future interactions with the teacher. Punishment can also trigger feelings of anger in students, as observed above.

Ineffective classroom layout was also evident in the 65th and 89th schools where a U-shape layout was used with a single central line of desks within it. This limitation of space and lack of access led to some students not being easily monitored by the teacher. It was observed that students did not use their class time well that they were less likely to engage with the topic and complete their work. For some students, there was no evidence that they completed the task or even attempted to, which often led to a lower mark or a verbal reprimand. However, observations also showed that some students who sat at the back of the classroom felt more able to try new things and this led to the trying out of alternative approaches to the task because they were away

from the control or monitoring of the teacher. Arguably in some situations the teacher might be considered by the students as overbearing or dictatorial in directing work. Contact between student and teacher was also observed to be limited by ineffective layout where group work with other students was restricted to two or three people within a whole class. There were even cases where no group work could be undertaken.

It would seem in overview of the observations of table and seating arrangements that there are a number of potential impacts upon learning experience created by the layout and resultant interactions between staff and students, and students with students.

Work displays in the selected schools were observed to take a variety of forms. Some of the art classroom walls observed were actually noted to be bare, limited in free space, or even too crowded with examples of work. In the 2nd school, the class was shared between three teachers with differing grade responsibilities i.e. intermediate students and secondary students which resulted in no display of either grade's work. In another school, the 51st, the art classroom was shared between intermediate and secondary schools and therefore secondary school students took precedence and so there were no examples of intermediate student work within the display. At the 78th school, the display was limited to providing information which was written, and printed too small for easy reading. At the 98th school, the display was not even related to the subject of art as it was shared with another class studying sewing which arguably caused the room to lose its identity as an art classroom. Finally, in the 66th school, the displays were overly crowded and compared to other schools messy and had too many colours or themes, and it was reported through the questionnaire that this reduced student interest in that area of the classroom. Some displays overlapped each other in terms of one piece of artwork partially covering another, preventing students from fully viewing work and negating the possibility of them gaining either more information or ideas. Some gathered dust, because they are difficult to reach and clean, and this suggested issues about the perceived value of the work, which would not be intended when originally displayed, e.g. not worth dusting. While it was generally considered supportive of trying new things, to have

others work displayed, it was observed that some students merely copied directly from the work on the display rather than pushing their own creative boundaries.

In most of the selected public schools in Jeddah, the art teacher used only one or two methods for display, such as hanging artwork on the wall or putting items on top of a display cabinet.

In overview of observations of wall displays and the practices of displaying work, a mixture of approaches were seen to be taken, but it was also noted that there was variation in wall space capacity for effective display. This suggests opportunity for improved understanding of the management and benefits of displaying student work.

6.3 Questionnaires

Following the observation of each of the three groups in the selected schools the questionnaire items that were related to the three sets of interventions previously declared in Table 3.2 were distributed to the student groups before and after interventions were made and there was a three week 'wash-out' period between.

The data obtained from each question before and after the interventions in each group were statistically analysed using Version 11.5 of the SPSS software applying a Non-Parametric Wilcoxon Signed Ranks Statistical Test. These results showed a significance level of 5% and a critical region of plus or minus 1.96 for a two-tailed test.

6.3.1 First Intervention Group G1

The intervention that was made in the art classroom environment in this group was related to table and seating arrangement and a 'grouping type' was used. The table arrangement was different in each school, in the 51st school an L-shape was in use, whereas in the 65th school a U-shape was in use, and in Dar Alhanan school a U-shape with a central table was in use. Figure 6.1, 6.2 and 6.3 show the layout in each school.

Figure 6. 1: The Art Classroom in 51st Intermediate Girls' School before and after intervention

Figure 6. 2: The Art Classroom in 65th Intermediate Girls' School before and after interventions

Figure 6. 3: The Art Classroom in Dar Alhanan Intermediate Girls' School before and after intervention

Three Likert-type questionnaire items related to table and seating arrangement were distributed to the students in this group, before and after interventions involving table and seating arrangements that were newly introduced within their classes. These three items were as follows:

Question (1): I prefer to take art sessions in our art classroom.

Question (2): The layout of our art classroom helps me to try new things in art tasks.

Question (3): Generally, I find the art classroom supportive of trying new things in art tasks.

Students' responses to the three selected questions prior to and following the implementation of table arrangement interventions are presented in Table 6.1 and illustrated in Figures 6.4 to 6.6.

Table 6.2 represents the descriptive ranks output data for each question on this test. Table 6.3 shows the Non-Parametric Wilcoxon Signed Ranks Statistical Test output data based on negative ranks. The Z-values for questions one, two and three are

-4.044, -4.858 and -4.343 respectively, while the P-values for all three questions stand at zero. This shows that there is a high statistically significant difference between the responses obtained before and after table arrangement interventions were made.

In addition, pre-intervention and post-intervention aggregate scores for all test questions were recorded, and the Wilcoxon Signed Ranks Statistical Test was then applied. Output data is presented in Table 6.4 and 6.5, with the test statistics based on negative ranks. They produce a Z-value (Z=-7.57) and a P-value (P=0.00) that reveal a high statistically significant difference between responses recorded before and after the intervention.

Table 6. 1: G1 Responses Pre- and Post-intervention

Students' responses	Strongly agree		Agree		Neither agree nor disagree		Disagree		Strongly disagree		Total	
	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)
Q1 – Pre	42	56.0	15	20.0	14	18.7	4	5.3	0	0	75	100
Q1 – Post	53	70.7	16	21.3	4	5.3	2	2.7	0	0	75	100
Q2 – Pre	7	9.3	12	16.0	23	30.7	15	20.0	18	24.0	75	100
Q2 – Post	30	40.0	16	21.3	12	16.0	9	12.0	8	10.7	75	100
Q3 – Pre	13	17.3	16	21.3	23	30.7	18	24.0	5	6.7	75	100
Q3 – Post	30	40.0	20	26.7	13	17.3	9	12.0	3	4.0	75	100

Table 6. 2: G1 Comparative Descriptive Ranks Output Data for Each Test Question

		N	Mean rank	Sum of ranks
Q1PRE - Q1POST	Negative Ranks	1	9.00	9.00
	Positive Ranks	21	11.62	244.00
	Ties	53		
	Total	75		
Q2PRE - Q2POST	Negative Ranks	1	3.00	3.00
	Positive Ranks	30	16.43	493.00
	Ties	44		
	Total	75		
Q3PRE - Q3POST	Negative Ranks	0	0.00	0.00
	Positive Ranks	24	12.50	300.00
	Ties	51		
	Total	75		

Table 6. 3: G1 Comparative Test Statistics Based on Negative Ranks for Each Test Question

	Q1PRE – Q1POST	Q2PRE – Q2POST	Q3PRE – Q3POST
Z	-4.044	-4.858	-4.343
Asymptomatic Significance (Asymp. sig.) (2-tailed)	0.000	0.000	0.000

Table 6. 4: G1 Comparative Ranks Output Data for All Test Questions

		N	Mean rank	Sum of ranks
Total PRE – total POST	Negative ranks	2	14.50	29.00
	Positive ranks	75	39.65	2974.00
	Ties	148		
	Total	225		

Table 6. 5: G1 Test Statistics Based on Negative Ranks for All Test Questions

	Total PRE– total POST
Z	-7.571
Asymp. sig. (2-tailed)	0.000

Figure 6. 4: G1 Students' Preferences for Using the Art Classroom Pre- and Post-test (Question One)
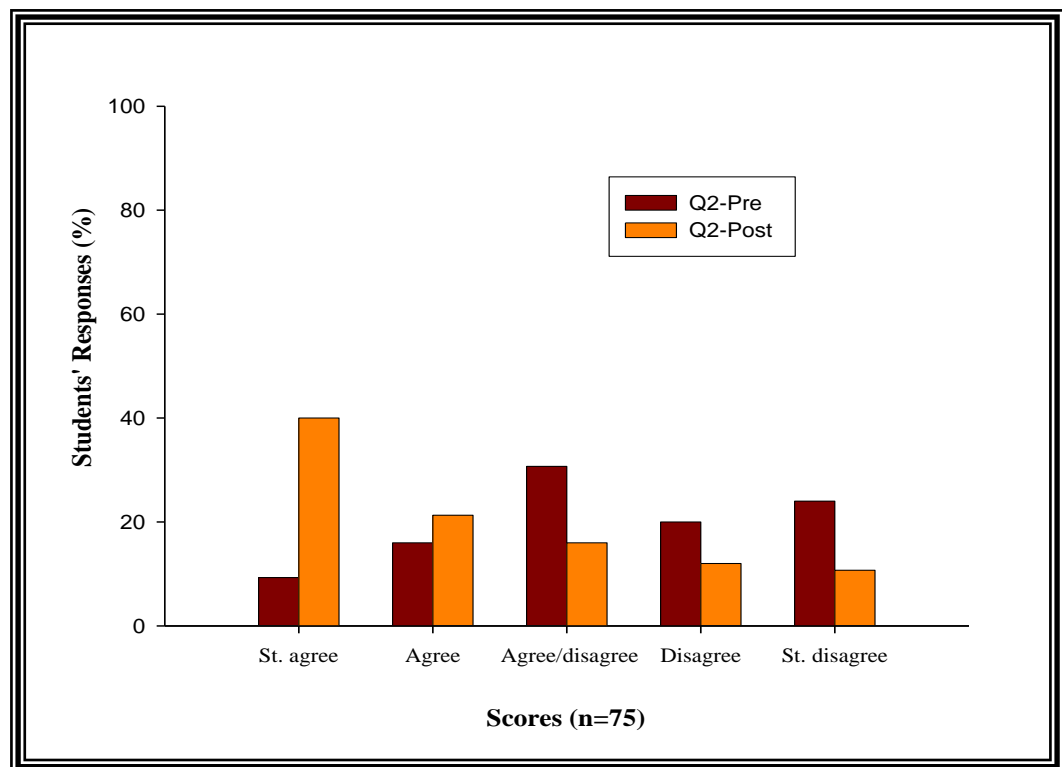
Figure 6. 5: G1 Students' Assessment of the Layout of their Art Classrooms in Helping Them Try New Things Pre- and Post-intervention (Question Two)

Figure 6. 6: G1 Students' Assessment of the Supportiveness of the Art Classroom in Trying New Things Pre- and Post-intervention (Question Three)

6.3.2 Second Intervention Group G2

The wall display changes were carried out at three intermediate girls' schools. All display areas in the 66th school art classroom were disorganised, and messy, and presented both new and old student artwork concurrently. Display areas in the 78th school were used ineffectively and only a few items were displayed for example curriculum related information. Display areas in Alibdaa school were under utilised with only a few materials displayed and these included instructional materials regarding tool and material use. The interventions that were made with the displays included the use of different displayed materials such as student artwork, information related to art education, and instructions. Figure 6.7: The Art Classroom in 66th Intermediate Girls' School before and after intervention. Figure 6.8: The Art Classroom 78th Intermediate Girls' School before and after intervention. Figure 6.9: The Art Classroom in Alibdaa Intermediate Girls' School before and after intervention.

Figure 6. 7: The Art Classroom in 66th Intermediate Girls' School before and after intervention

Figure 6. 8: The Art Classroom 78th Intermediate Girls' School before and after intervention.

Figure 6. 9: The Art Classroom in Alibdaa Intermediate Girls' School before and after intervention

The display interventions used students' own artwork, which were the culmination of their projects.

Three Likert-type questionnaire items related to wall displays were distributed to the students in these groups pre-intervention and post-intervention after interventions with the wall displays were introduced within their classes. The three questions were as follows:

Question (1): I prefer to take art sessions in our art classroom.

Question (2): The work display in our classroom inspires me to be more creative.

Question (3): Generally, I find the art classroom supportive of trying new things in art tasks.

Table 6.6 presents students' responses to the three selected questions before and after wall display interventions had been initiated in their classrooms. Their answers are also illustrated in Figures 6.10 to 6.12.

Table 6.7 represents output of the ranks data for each question on this test. Table 6.8 shows the test statistics based on negative ranks. The Z-values for questions one, two and three are -2.041, -4.269 and -2.850 respectively, and the P-values for the same are 0.041, 0.000 and 0.004. This shows that there is a statistically significant difference in students' responses to all questions after interventions had been made to the wall displays in their classrooms.

Pre-intervention and post-intervention aggregate scores of all the test questions were recorded, and the Wilcoxon Signed Ranks Statistical Test was then applied. Output ranks are presented in Table 6.9, and test statistics based on negative ranks are shown in Table 6.10. The test's Z-values and P-values (-5.426 and 0.000 respectively) prove that responses obtained after the wall display interventions test were significantly different from those compiled before the test.

Table 6. 6: G2 Responses Pre- and Post-intervention

Students' responses	Strongly agree		Agree		Neither agree nor disagree		Disagree		Strongly disagree		Total	
	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)
Q1 – Pre	53	70.7	12	16.0	5	6.7	2	2.7	3	4.0	75	100
Q1 – Post	55	73.3	14	18.7	3	4.0	2	2.7	1	1.3	75	100
Q2 – Pre	19	25.3	9	12	11	14.7	10	13.3	26	34.7	75	100
Q2 – Post	34	45.3	17	22.7	8	10.7	6	8	10	13.3	75	100
Q3 – Pre	32	42.7	16	21.3	12	16.0	10	13.3	5	6.7	75	100
Q3 – Post	37	49.3	19	25.3	10	13.3	6	8.0	3	4.0	75	100

Table 6. 7: G2 Comparative Descriptive Ranks Output Data for Each Test Question

		N	Mean rank	Sum of ranks
Q1PRE – Q1POST	Negative ranks	0	0.00	0.00
	Positive ranks	5	3.00	15.00
	Ties	70		
	Total	75		
Q2PRE – Q2POST	Negative ranks	0	0.00	0.00
	Positive ranks	23	12.00	276.00
	Ties	52		
	Total	75		
Q3PRE – Q3POST	Negative ranks	0	0.00	0.00
	Positive ranks	10	5.50	55.00
	Ties	65		
	Total	75		

Table 6. 8: G2 Comparative Test Statistics Based on Negative Ranks for Each Test Question

	Q1PRE – Q1POST	Q2PRE – Q2POST	Q3PRE – Q3POST
Z	-2.041	-4.269	-2.850
Asymp. sig. (2-tailed)	0.041	0.000	0.004

Table 6. 9: G2 Comparative Ranks Output Data for All Test Questions

		N	Mean rank	Sum of ranks
Total PRE – total POST	Negative ranks	0	0.00	0.00
	Positive ranks	38	19.50	741.00
	Ties	187		
	Total	225		

Table 6. 10: G2 Test Statistics Based on Negative Ranks for All Questions

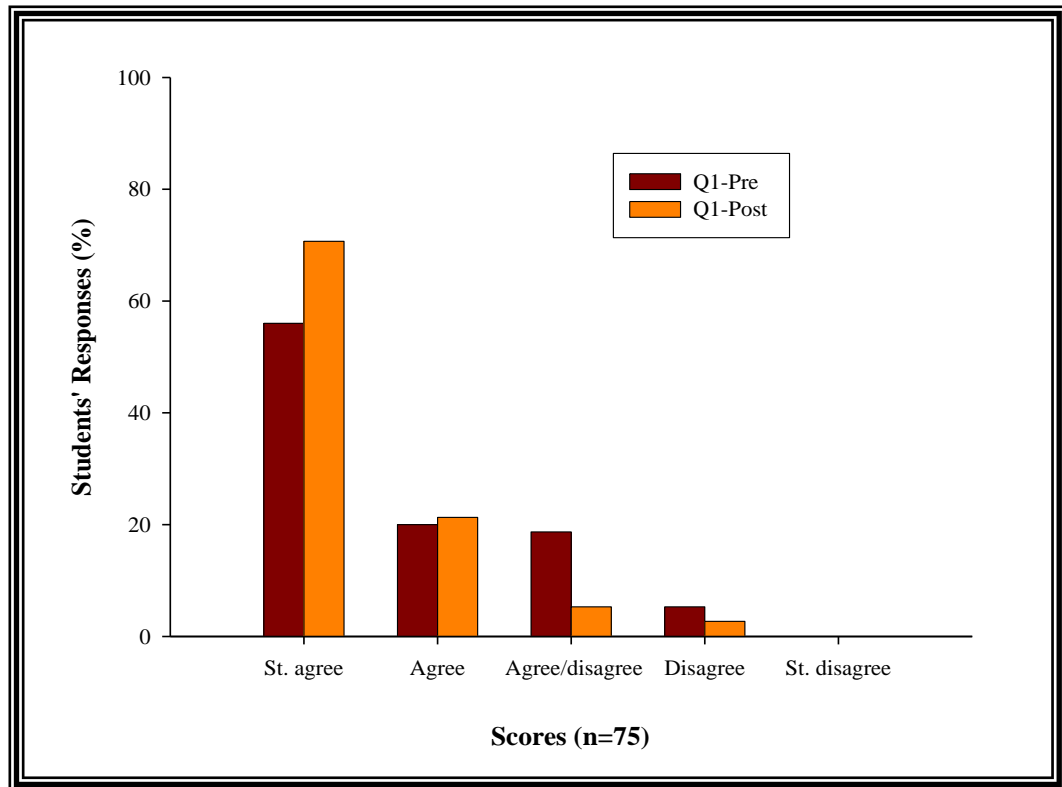|	Total PRE– total POST
Z	-5.426
Asymp. sig. (2-tailed)	0.000

**Figure 6. 10:** G2 Students' Preferences for Using the Art Classroom Pre- and Post-test (Question One)

Figure 6. 11: G2 Students' Assessment of the work display in Their Art Classrooms Pre- and Post-intervention (Question Two)
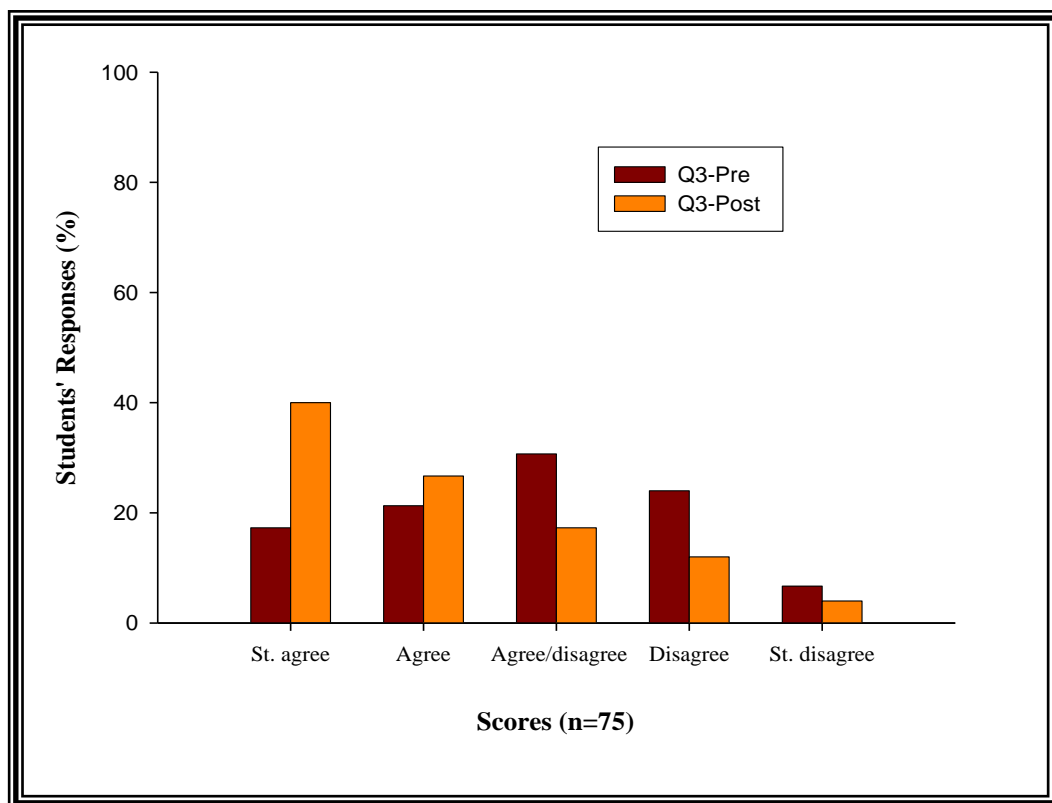
219

Figure 6. 12: G2 Students' Assessment of the Supportiveness of Their Art Classrooms in Trying New Things Pre- and Post-intervention (Question Three)

6.3.3 Third Intervention Group G3

The layout of the table and seating arrangement and display in the art classrooms in this group were different in each school. In the 98th School the tables were gathered into a single central line and display areas in this school art classroom were mainly in the front while the rest of the classroom walls were bare and utilised areas displayed in the main sewing subject related work. The layout of 2nd school consisted of two horizontal lines of tables with no display in the classroom and the layout of Anjal Albasateen school was a U-shape with only a few displayed artworks on one wall. The changes that were made in this intervention group were similar to group one and two in respect of layout and display respectively. Figure 6.13: The Art Classroom in 98th Intermediate Girls' School before and after intervention. Figure 6.14: The Art Classroom 2nd Intermediate Girls' School before and after intervention. Figure 6.15: The Art Classroom in Anjal Albasateen Intermediate Girls' School before and after intervention.

Figure 6. 13: The Art Classroom in 98th Intermediate Girls' School before and after intervention.
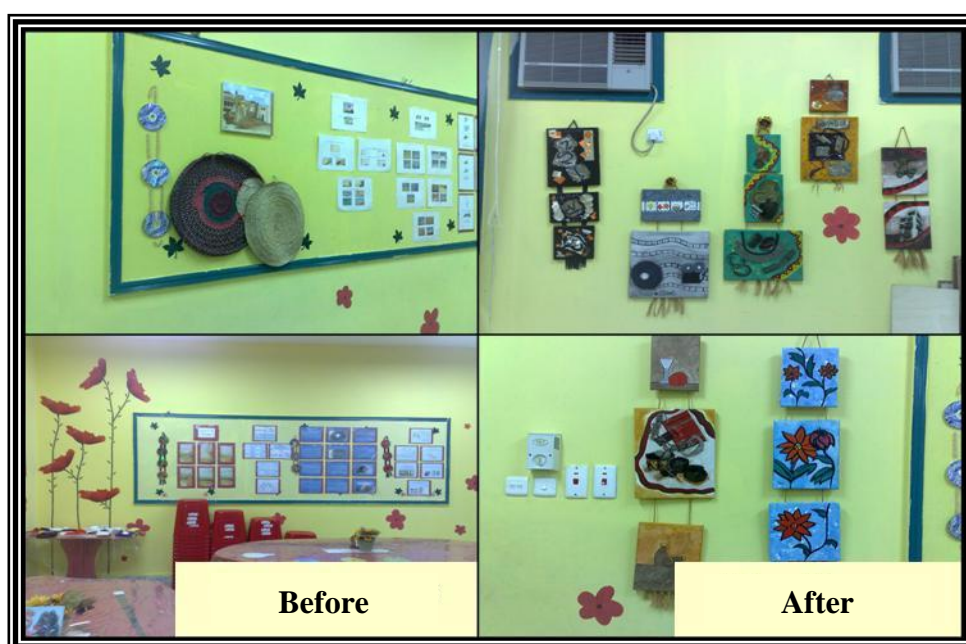

Figure 6. 14: The Art Classroom 2nd Intermediate Girls' School before and after intervention

Figure 6. 15: The Art Classroom in Anjal Albasateen Intermediate Girls' School before and after intervention

Prior and following the intervention that was carried out, four Likert-type questionnaire items related to table and seating arrangements, and wall display were distributed to students in this group. The items were as follows:

Question (1): I prefer to take art sessions in our art classroom.

Question (2): The layout of our art classroom helps me to try new things in art tasks.

Question (3): The work display in our art classroom inspires me to be more creative.

Question (4): Generally, I find the art classroom supportive of trying new things in art tasks.

Table 6.11 presents students' responses to the four selected questions both before and after table and seating arrangements and wall display interventions were implemented in their classrooms. These responses are also illustrated in Figures 6.16 to 6.19.

Table 6.12 represents the ranks data for each question on this test. Table 6.13 shows the test statistics based on negative ranks. These reveal that the Z-values for questions one to four are -3.668, -5.047, -3.779 and -4.992 respectively, the P-values

for all questions are (P=0.000). This shows that there is a high statistically significant difference between all responses obtained before and after the test.

Pre-intervention and post-intervention aggregate scores of all the test questions were recorded, and the Wilcoxon Signed Ranks Statistical Test was then applied. Output ranks are presented in Table 6.14, and test statistics based on negative ranks are shown in Table 6.15. The test's Z-values and P-values (-8.721 and 0.000) reveal that there is a high statistically significant difference in the responses obtained after the test had been carried out.

Table 6. 11: G3 Responses Pre- and Post-intervention

Students' response	Strongly agree		Agree		Neither agree nor disagree		Disagree		Strongly disagree		Total	
	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)	Score	(%)
Q1 – Pre	36	48.0	5	6.7	23	30.7	3	4.0	8	10.7	75	100
Q1 – Post	42	56.0	16	21.3	11	14.7	3	4.0	3	4.0	75	100
Q2 – Pre	12	16.0	4	5.3	19	25.3	14	18.7	26	34.7	75	100
Q2 – Post	33	44.0	12	16.0	11	14.7	10	13.3	9	12.0	75	100
Q3 – Pre	21	28.0	7	9.3	18	24.0	15	20.0	14	18.7	75	100
Q3 – Post	31	41.3	15	20.0	12	16.0	9	12.0	8	10.7	75	100
Q4 – Pre	21	28.0	14	18.7	22	29.3	10	13.3	8	10.7	75	100
Q4 – Post	44	58.7	17	22.7	8	10.7	4	5.3	2	2.7	75	100

Table 6. 12: G3 Comparative Descriptive Ranks Output Data for Each Test Question

		N	Mean rank	Sum of ranks
Q1PRE– Q1POST	Negative ranks	0	0.00	0.00
	Positive ranks	17	9.00	153.00
	Ties	58		
	Total	75		
Q2PRE – Q2POST	Negative ranks	1	2.00	2.00
	Positive ranks	32	17.47	559.00
	Ties	42		
	Total	75		
Q3PRE– Q3POST	Negative ranks	0	0.00	0.00
	Positive ranks	18	9.50	171.00
	Ties	57		
	Total	75		
Q4PRE– Q4POST	Negative ranks	0	0.00	0.00
	Positive ranks	32	16.50	528.00
	Ties	43		
	Total	75		

Table 6. 13: G3 Comparative Test Statistics Based on Negative Ranks for Each Test Question

	Q1PRE– Q1POST	Q2PRE– Q2POST	Q3PRE– Q3POST	Q4PRE– Q4POST
Z	-3.668	-5.047	-3.779	-4.992
Asymp. sig. (2-tailed)	0.000	0.000	0.000	0.000

Table 6. 14: G3 Comparative Ranks Output Data for All Test Questions

		N	Mean rank	Sum of ranks
Total PRE – total POST	Negative ranks	1	13.00	13.00
	Positive ranks	99	50.88	5037.00
	Ties	200		
	Total	300		

Table 6. 15: G3 Test Statistics Based on Negative Ranks for All Test Questions

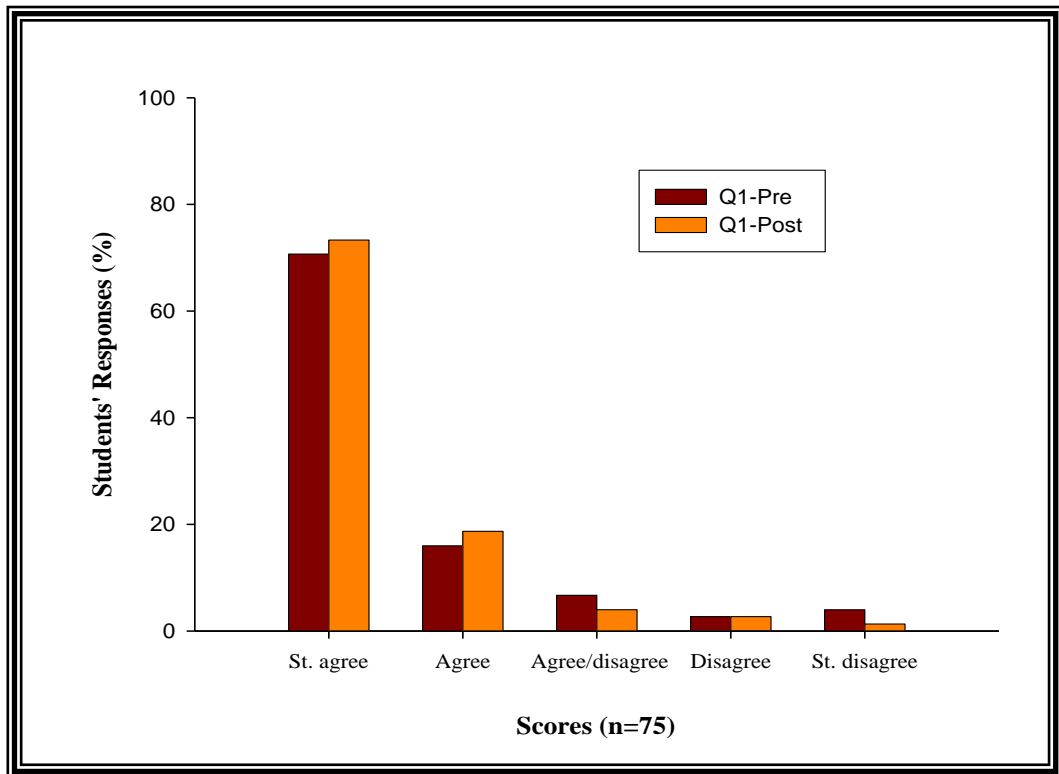|	Total PRE– total POST
Z	-8.721
Asymp. sig. (2-tailed)	0.000
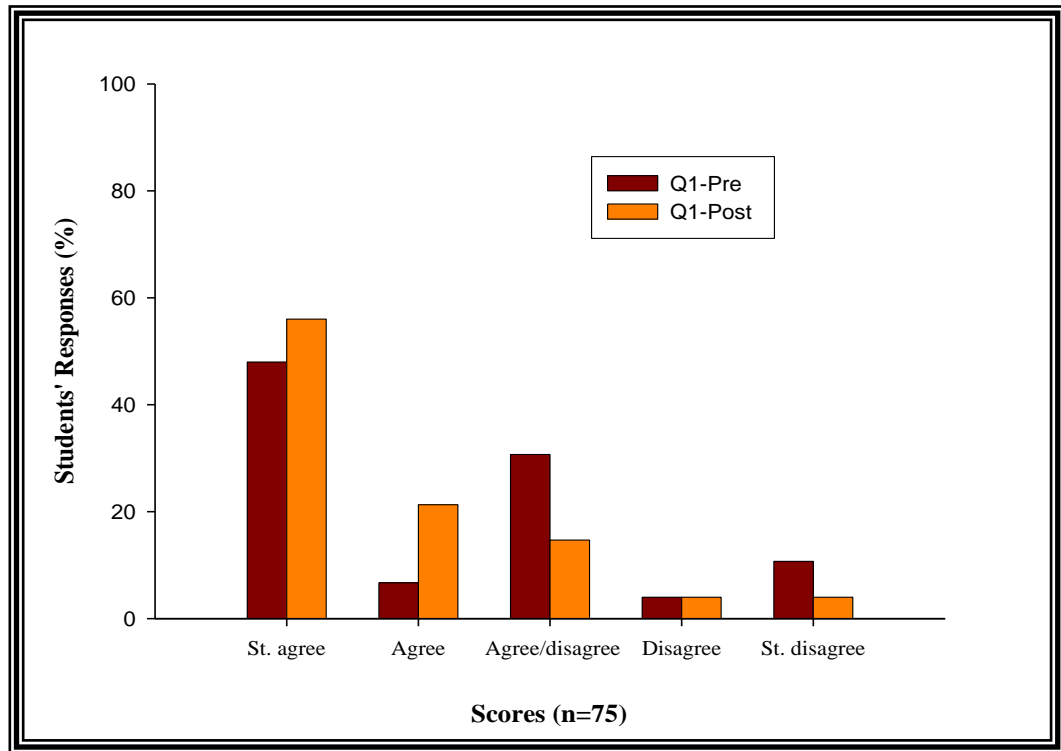
Figure 6. 16: G3 Students' Preference for Using the Art Classroom Pre- and Post-intervention (Question One)
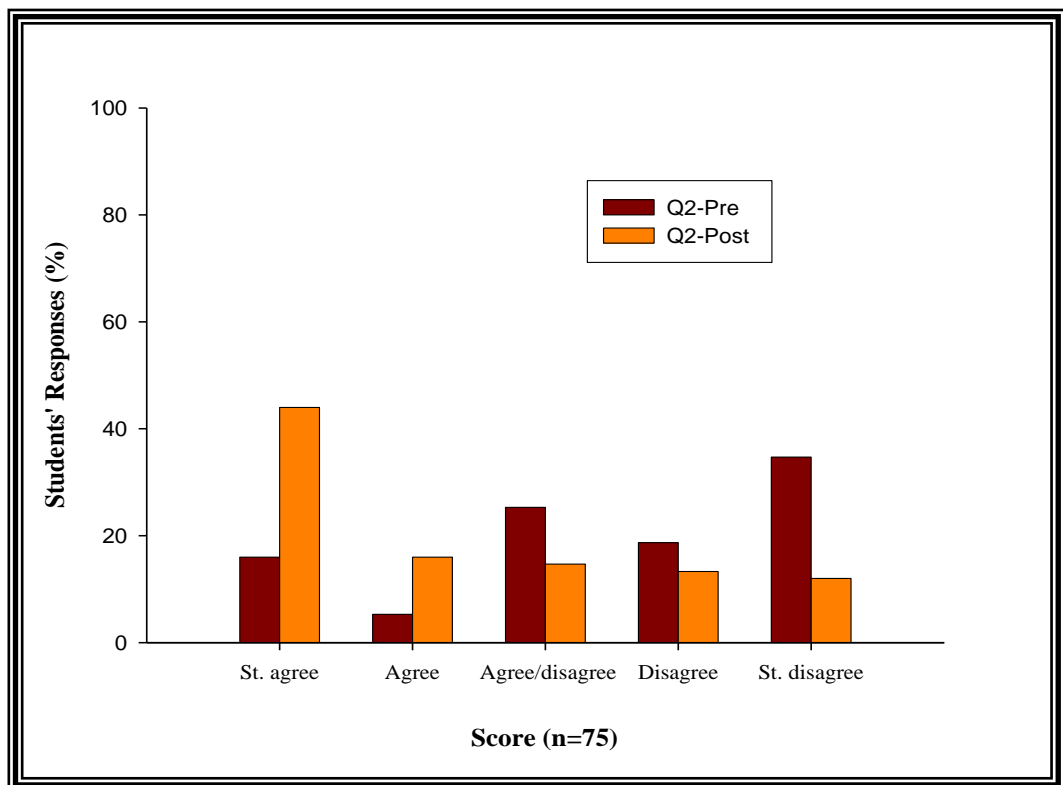
Figure 6. 17: G3 Students' Assessment of the Layout of Their Art Classrooms Pre- and Post-intervention (Question Two)
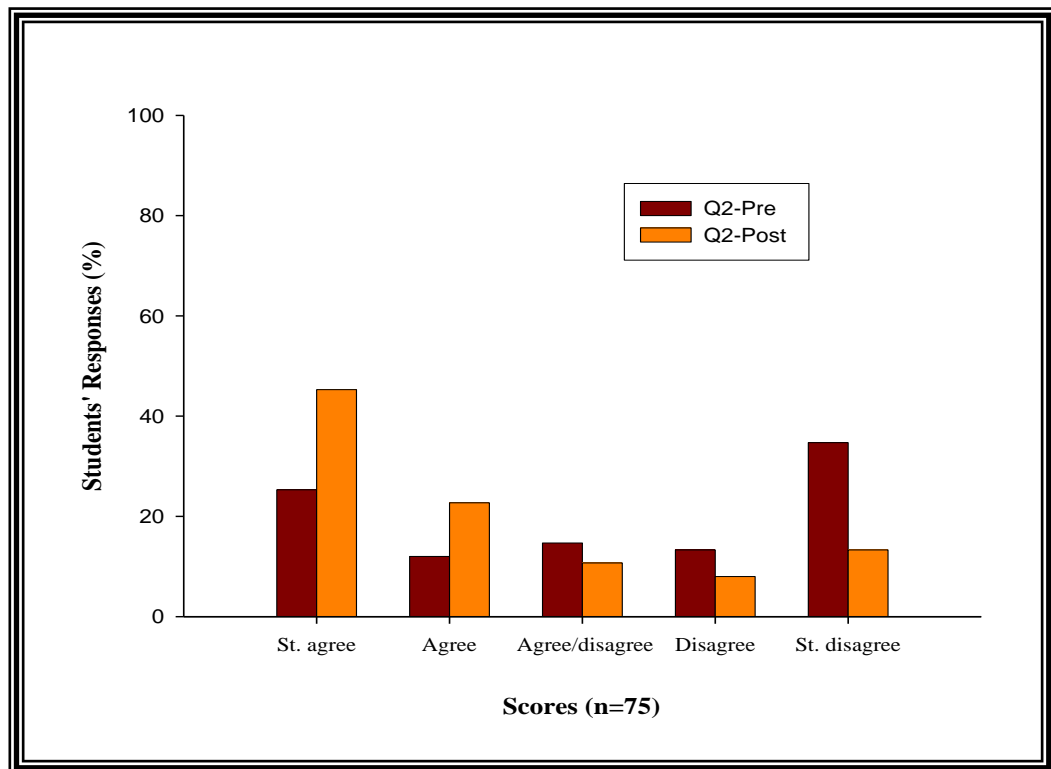
225
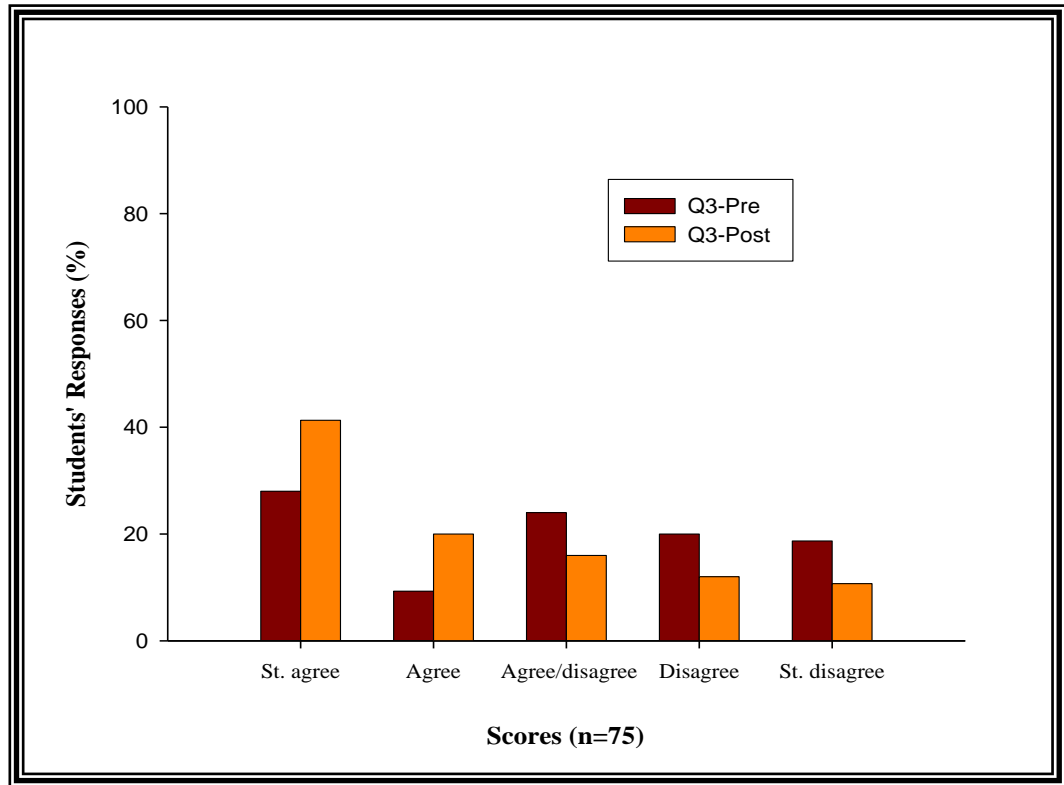
Figure 6. 18: G3 Students' Assessment of the work display in Their Art Classrooms Pre- and Post-intervention (Question Three)
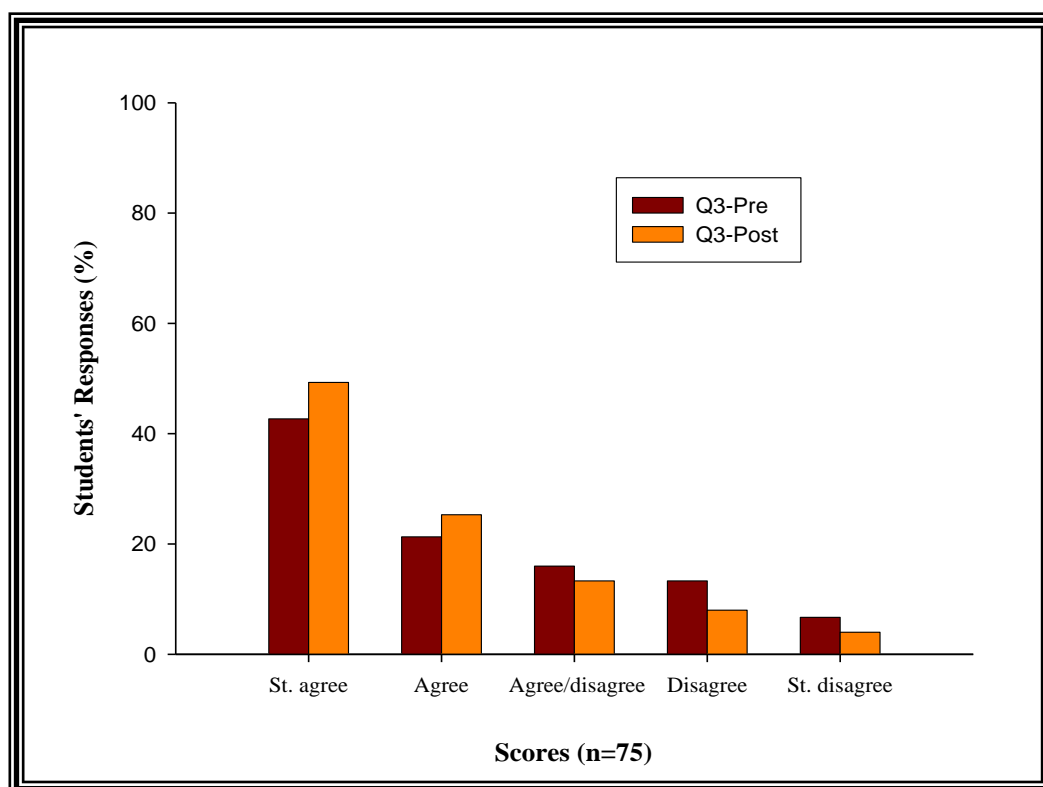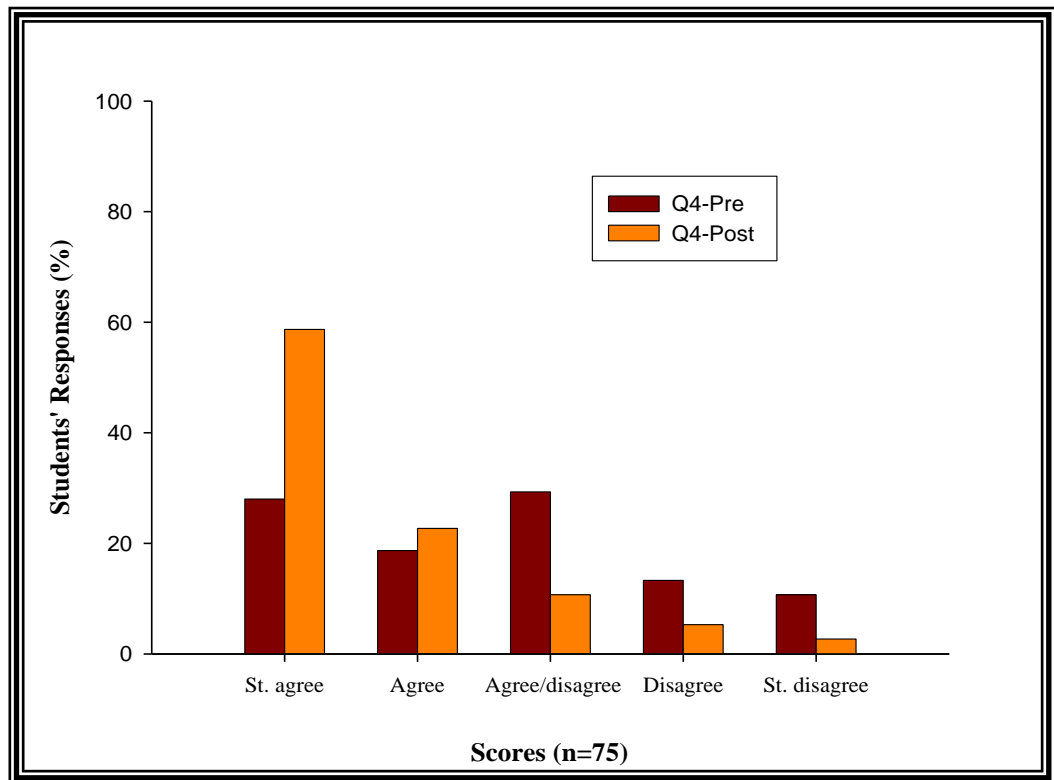

Figure 6. 19: G3 Students' Assessment of the Supportiveness of Their Art Classrooms in Trying New Things Pre- and Post-intervention (Question Four)

6.4 Overview of Intervention Groups

The three intervention groups generated a substantial amount of data that again demonstrate the importance of factors in enhancing students' motivation to try new things in order to improve creative thinking and practices. Tables and seating within the classrooms in the first group were rearranged, wall displays in the classrooms of the second group were changed, and both forms of intervention were combined for the third group. I undertook the combined interventions to see whether the impact of making a single intervention would be measurably different from making a double intervention. Questionnaire items relating to table and seating arrangements and wall display interventions were distributed to each group before and after these interventions were implemented, and each student's answers were recorded and analysed.

6.5 Follow-up School Visits

Following the collection and analyses of data obtained from observations, interviews, questionnaires, and the implementation of interventions in selected schools, I undertook follow-up visits. This took the form of informal discussions with individual art teachers and school principals regarding the importance of constructing a 'best-practice' art classroom environment for students' creativity. Both senior management and teachers were found to be very interested in this matter and, within the constraints they have, showed a willingness to make changes which could enhance students' creativity. I was asked to provide an Arabic translation of the research recommendations or a copy of my research to aid their understanding and application of the environmental factors; and this reflects significance and an identified need within this learning context.

In April 2010 after a gap of four months, I conducted follow-up visits to the selected schools in Jeddah to obtain their feedback about the interventions made in each school, and I found that:

In the first school the 98th, the school transferred to a new school building and they selected a large art classroom assigned only for art. The furniture was changed and they applied a grouping layout for tables and seating arrangement. The art teacher

said that she had managed to implement some of my suggested changes as the space was larger and this was having a positive effect on her lessons. In addition, some artwork had been displayed but it had not yet been arranged because the classroom move had only just been completed. Figure 6.20 is a sample of the Art Classroom in 98th Intermediate Girls' School.

Figure 6. 20: The Art Classroom in 98th Intermediate Girls' School

The art classroom in the third school, the 65th, had been moved to another larger classroom with some additional facilities including a ventilation system. The chairs were replaced with a more comfortable type of seat. In addition, different types of display had been added. They also informed me that they are planning to add sinks in line with my suggestions. Figure 6.21 is a sample of the Art Classroom in 65th Intermediate Girls' School

Figure 6. 21: The Art Classroom in 65th Intermediate Girls' School

In the fourth school, the 2nd, the school had moved to a new building and the art classroom was assigned for only two art teachers of the same level with a larger classroom size. They used the same old furniture. In addition, there were more facilities added, such as a sink and a ventilation system. The wall colour was pink with some artwork displayed but it had not yet been arranged because they classroom move had only just been completed. Figure 6.22 is a sample of the Art Classroom in 2nd Intermediate Girls' School.

Figure 6. 22: The Art Classroom in 2nd Intermediate Girls' School

In the fifth school 66th, the teacher changed the table and seating arrangements from a U-shape to a grouping arrangement. The teacher informed me that this arrangement allowed her to move around the class more easily and help the students. Figure 6.23 is a sample of the Art Classroom in 66th Intermediate Girls' School

Figure 6. 23: The Art Classroom in 66th Intermediate Girls' School

In the ninth school Anjal Albasateen, the art classroom was moved to another room, with white walls which the teachers felt was more suitable for display. It is smaller in size but still accommodates all the students. Figure 6.24 is a sample of the Art Classroom in Anjal Albasateen Intermediate Girls' School
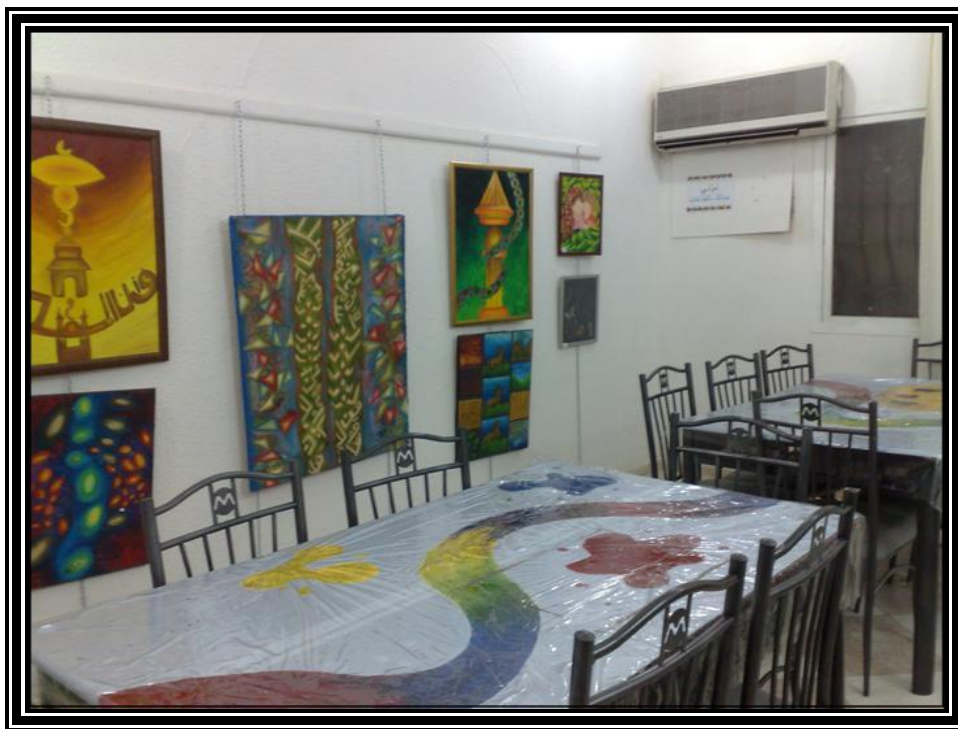
Figure 6. 24: The Art Classroom in Anjal Albasateen Intermediate Girls' School

In two public schools, the 51st and the 78th, and two private schools Alibdaa and Dar Alhanan, the schools had kept the changes I had made with regards to updated displayed materials and they expressed satisfaction with these changes.

The feedback that I received from the schools suggested that I should formalise and translate those findings from this research that would help art educators to manage the art classroom and effectively stimulate students' creativity.

6.6 Discussion

This section discusses the materials, methodology and the findings obtained by research tools including observations, interviews, questionnaires and interventions. Each of these tools was described in detail in the previous chapters and sections, which also describe the layout of tables and seating arrangement as well as display changes selected and applied in the three intervention groups.

6.6.1 Introduction

Building upon a developing understanding of the art classroom and social factors that influence perceptions of creative thinking and practices of adolescent girls in Jeddah, Saudi Arabia, this section has sought to answer the research question: "*Is it possible to improve perceptions of creative thinking and practices, of adolescent girls in Saudi Arabia, through control of art classroom environments?*" In each group, the questionnaire, and observations were used as tools to evaluate the influence of interventions implemented on the improvement of perceptions of their creative thinking and practices in the art classrooms of intermediate girls' schools.

6.6.2 Teachers' Perspective

The discussions of findings obtained in this research support the research question. Teachers may play a major role in the development of students' perceptions of their creative thinking and practices through the control of the learning environment. Therefore, educational authorities in Saudi Arabia should arrange teacher-training programs and workshops of instructions around creative practice and teaching environments; inviting experienced teaching professionals to share their experiences and ways of developing creativity; and improving their teaching strategies. In addition, art teachers should be aware of adolescent characteristics and the relationship between physical environment and students' behaviour in order to arrange and adjust an art classroom environment that welcomes exploration of the subject, and promotes creative behaviours and perceptions of creative thinking and practices. In respect to teacher interviews, all teachers had their own perspectives about creative behaviours, and they applied this understanding to develop learning experiences for their students. Teachers should ensure that the art classroom is set up in a way that will allow students to apply these approaches to their own learning so that each individual can achieve his or her potential and also have a positive influence on his or her peers.

The teacher is a significant part of the learning experience. They can act as a go-between, identifying students' real-life classroom needs and communicating these to the local education authority, who can then implement procedures to address these needs and enhance the learning environment. However, teachers should also utilise the materials they are given and utilise a diverse range of methods to identify which

works best for them to enhance students' creative thinking and practices. The art teacher's awareness of factors that can encourage students' creativity is important; therefore, it would be beneficial if the local education authority would equip teachers with a guide, instructing them on possible different ways to set up the art classroom environment and the different impacts that these setups will have on the art lesson.

Observations and interviews suggested that art teachers should have their own classroom and the freedom to manage it as the situation requires. This would enable them to apply their own personality to the room so that it can be used to reflect the specific relationship between the teacher and students. This would create an artistic dialogue through the way they collectively organise information, class instruction, and how students work in the room.

Better communication between students and the teacher allowed more sharing of ideas. The increased interaction between class peers and the teacher allowed discussion, and the teacher gained a more in depth understanding of students, which arguably helped assessment and targeting of lesson aims. However, through this exchange of ideas, students may decide through the pressure of the group, that someone else's idea is better than their own and then copy it. This can result in a group delivering off-aim, and negating the potential for creativity e.g. when the teacher has required them to draw a different flower each, but they each drew one type of flower as a group. It was noted that discussions between students can still naturally deviate from the topic focus.

Increased exchange with students and monitoring allows the teacher to act pro-actively and respond to the developing situations before it becomes an issue. However, this may also lead to a strict teacher making unnecessary interventions and picking up on small infractions, disrupting the class continuously.

6.6.3 Classrooms

In the 98th, 51st, and 2nd schools, teachers considered having a classroom assigned for the subject of art instead of sharing a classroom with other subjects or levels. I noted throughout my observations that in shared classrooms, each teacher relied on the other teachers to arrange the room. It was difficult to reach an agreement on how they should arrange the classroom and display materials, this led to classes being

poorly organised. Arguably, this resulted from a lack of understanding and guidance regarding classroom arrangement either from the school's administration or between the teachers themselves. The teachers did not demonstrate a thorough understanding of the impact that their classroom management had on subsequent lessons nor how such an art classroom environment could affect students' creative thinking and practices. For example, in one of the shared classrooms, the display was to support the subject of sewing only and this visual stimulation potentially distracted some of the students from their artwork. Therefore, wherever possible art classrooms should be used specifically for teaching art. Any attempt to teach other subjects in art classrooms could potentially have a detrimental effect on those lessons. A similarly negative effect could occur when students are taught art in an unsuitable classroom, for example, in a sewing classroom. Students need to be psychologically safe enough in their classroom to enhance their exploration and creativity (Starko, 2005). From my study arguably, as well as being psychologically safe, environmental variables such as: materials storage and display placement, all contribute to the general and individual feeling of support from the art classroom.

Danielson (2007) states that establishing a healthy classroom environment is a critical aspect of a teacher's skill in supporting learning. If students feel comfortable in their classroom, they can concentrate on the learning process. However, if there is a negative atmosphere in a classroom, students may fear ridicule. If the classroom environment is not well organised, neither teachers nor students can focus on learning (Danielson, 2007). Disorganised art classrooms send a negative message to students; they feel that they are not welcome and this affects their experience. Loughlin and Suina (1982) argue that the interaction with environmental factors could contribute positively or negatively to students' learning experiences and behaviour. This was corroborated by the interviews with students in which they were asked to describe their art classroom. From my observations those who described it as being noisy, busy and crowded related that these factors had a negative effect on their experience in the art classroom. For example, insufficient personal space due to classroom layout led to poor concentration and a disruptive atmosphere, which prevented the teacher from communicating expectations effectively to the class.

Art classrooms in all schools are furnished with different types of furniture. This variation in furniture is sometimes due to administration choices or the art teacher involved in the selection. Budget, experience, and specific product availability are further factors that influence furniture acquisition. It is interesting to note that the MoE provide the furniture in all newly built schools. This is at the instigation and due to the recent accession of a pro-education monarch in Saudi Arabia: King Abdullah bin Abdulaziz. He required the MoE to introduce new proactive and positive educational policies with regard to the learning environment and teaching methodologies across the whole school system. The components of art classroom furniture are composed of many items such as tables, seats, cupboards, lockers and the teacher's desk. Despite this very positive action by the government to relate environment to learning, I observed several examples of teachers who were unaware of the need to organise their classroom properly, perhaps through lack of suitable training, this was observed through elements as simple as the need to select items of furniture that are suitable in size for their classroom, for example, in some instances, the teacher had a disproportionately large desk in a classroom that was already lacking space. This space could have been reorganised to be used more effectively to allow students more room to work. One way to achieve this would be to obtain a smaller desk.

From my observations an art classroom needs to be a comfortable and supportive space. Some types of layout that are used in classrooms may reduce space. Class sizes with insufficient space (which includes most of the selected public schools) led to the overlapping of personal space and crowding, which increased potential for aggressive behaviours of students for example, shouting and expressions of frustration as students competed for space, which agrees with Savage and Savage (2009). This ill considered management of space can cause excessive noise and lead students to clash with each other, which might affect their relationship, mood and cooperation during lessons. This can also affect students' discussion, which leads to less opportunity to exchange ideas and experiences. In a number of the selected schools for example at the 65th school, they used a U-shape arrangement which resulted in some students overlapping; this led to a limitation in students' space, which affected their ability to do their work. In such situations because some students cannot sit comfortably they prefer to stand or even sit on the floor to try and

get a comfortable position. Students could only communicate with two or three others at a time in this situation.

Insufficient space may disturb the relationship between students. Adolescent relationships are often more volatile than adult ones, and while adults are usually able to set aside their differences in order to co-operate to achieve a common goal, adolescents are much more easily upset and can simply refuse to work with one another. I noticed that when students were given the freedom to choose where they sat, they often chose to sit in the same groups every lesson. This behaviour inhibited their working with other members of the class who they would not normally sit with, and thus restricted their opportunities to observe a wider a range of artistic approaches. Conversely, if the teacher changed the seating plan too often, students may not have had the chance to build productive working relationships with their peers. The teacher should be aware of the positive and negative effects that social interaction between students can have in the classroom, and she or he should consider their individual and collective characteristics when organising the layout of the classroom in order to obtain the most value from interaction between students.

6.6.3.1 Table and Seating Arrangements

It was observed that the type of tables and seating arrangements reduce communication between the teacher and students by limiting the teacher's movement. The teacher may not be able to reach students in order to talk privately, since some students would rather not talk or raise their voices and be heard by the entire class. Therefore, ideas may not have the opportunity to develop as well through discussion and feedback. If the teacher can listen to the students and then deliver the ideas to the class, the students will be more confident in expressing their ideas next time. Teacher assistance and feedback is very important. Students need time for individual contact, to receive the teacher's feedback and discover what they can do to improve their work in order to enhance their creative thinking and practices. Nevertheless, immediate solving of any problem that may arise e.g. when students are using tools with sharp edges and are acting in a dangerous manner, the teacher can immediately intervene to make the situation safe.

After the implementation of grouping table and seating arrangement G1 and G3, I noted that the noise in the classrooms was reduced. This was because students did not have to compete for space any more as the full dimensions of the tables were used to optimum effect. This reduced the noise levels from students complaining or arguing with each other in order to find their own space in which to work. In addition, the need to move furniture around the room, which can be very noisy and time consuming, was eradicated because the furniture was already in the best position possible for that activity. Therefore, the furniture was arranged prior to a class starting; in a formation that would best meet the class goals; and taking into account student numbers, classroom size, and table and chair size, and most importantly student safety when moving or evacuating the room in an emergency. This resulted in enhanced student concentration. The teacher should be aware of the importance of the different types of layout of tables and seating arrangements when organising the art classroom to ensure better student communication, interaction and discussion.

In addition, 'grouping' arrangement creating a friendly and nurturing atmosphere between teachers and students is an important element of this process. This can have a positive influence on students by encouraging them to be creative and to have confidence to express their ideas and make mistakes which is in agreement with the findings of (Starko, 2005), Goleman *et al.,* (1993), and Cromwell (1993). When teachers are themselves motivated to create, students will be relaxed and encouraged to be creative in the class (Horng *et al*., 2005). Teachers can enhance the creativity of their students by focusing on those factors known to improve student perceptions of the value of creative thinking and practices.

As I noted, for example in the 56th school's U-shaped layout and the 89th school with its single central line with limitation of space, students who were not being monitored by the teacher due to limited teacher movement did not do the task, while others did try alternative approaches to the task because they were away from the control or monitoring of the teacher. The caveat to this was that some teachers observed, could be overbearing or dictatorial in directing students' work at times. It is important to note that an overly controlling approach to teaching can inhibit creativity (Amabile, 1992; Goleman *et al.*, 1993). The teacher should monitor

students, especially at the beginning of a task, because teachers must ensure that students' work is progressing correctly. However, after a time, students should be given the freedom to develop their work in the direction that they wish. At this stage it is important that they are encouraged and supported to try new things. This approach might be facilitated through a table and seating arrangement that allows for unobtrusive monitoring and intervention (where required) that does not disturb other students. Figure 6.25 is an example of classroom layout with teacher monitor.
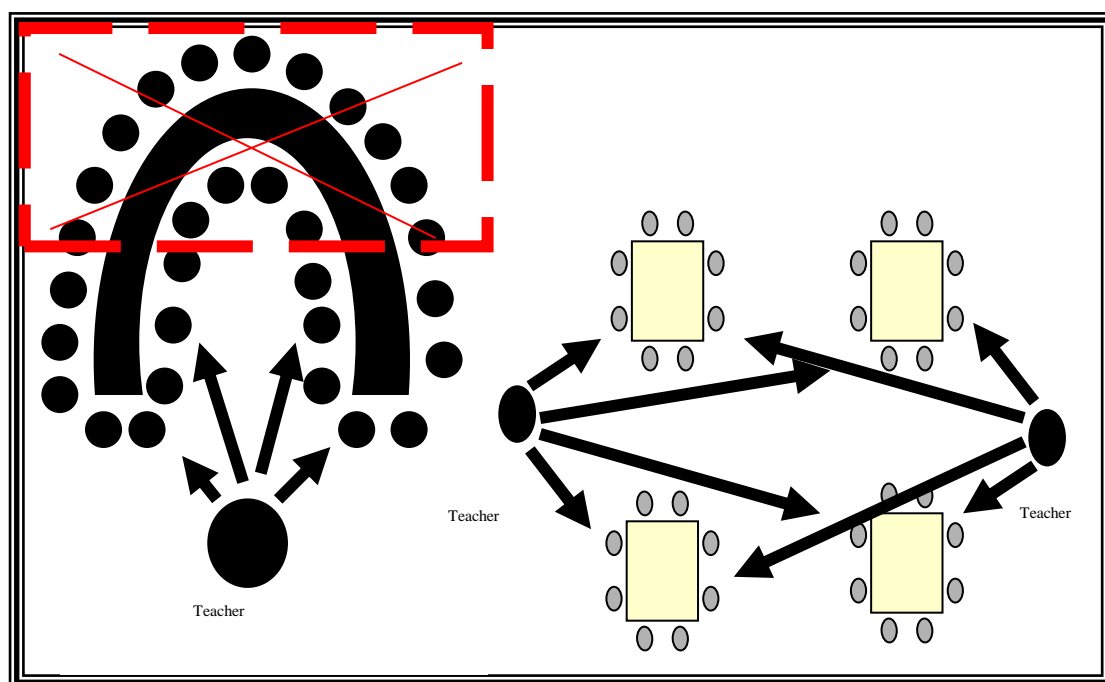
Figure 6. 25: Example of classroom layout with teacher monitor

An arrangement, which would typically group 6-8 students such as Group One G1 and G2, when used with a large number of students in a small space, provides more space and allows easier movement than the U-shape or single central line. Students were able to sit comfortably because all table dimensions were used effectively; therefore, they could find a suitable space to sit at and complete their task. It is interesting to note that this lack of dedicated space per student is an issue specifically for those responsible for delivering art in the schools studied as in all other general classrooms there are sufficient chairs and tables for students and each student is assigned a space. By facilitating students' seating arrangements, teacher mobility and movement around the classroom was enhanced and teachers were able to discuss, monitor students' talk, and provide the required assistance and feedback to each group individually. Students were able to access the art tools and exchange tools

easily. The findings in this respect are in agreement with researchers who demonstrated the importance of facilitated traffic patterns and movement around the classroom (Reid *et al.*, 1990; Caissy, 1994; McLeod *et al.*, 2003; Muijs and Reynolds, 2005; Savage and Savage, 2009). Figure 6.26 example of number of students at the table according to table, seat, and classroom size.
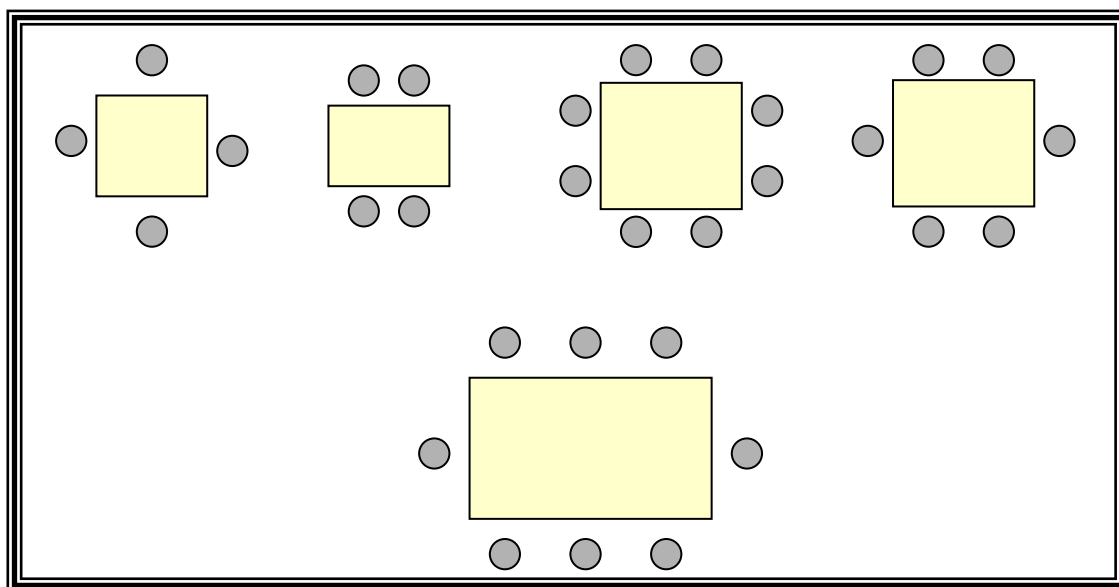
Figure 6. 26: Example of number of students at the table according to table, seat, and classroom size

A grouping arrangement such as that tried with G1 and G3 allowed the seating of four to eight students at each table according to class size. This enabled students to have more interaction, communication, discussion, exchange of experiences, to generate more ideas, help each other, observe others' work, and evaluate their work and others' work by asking each other 'what do you think about my work' and 'what do I need to do to improve it?'. They have more ambition to try many new things to improve the quality of their work, and students who were not involved in discussion before the implementation of these interventions became more involved in students' discussions. The interaction with the teacher was enhanced and the quality of students' questions to their teacher was higher. The findings in respect to the usefulness of the grouping arrangement are in agreement with other researchers who demonstrated the influences of seating students in a circle and its relation to the encouragement of students to work in groups. This seating arrangement also improves social interaction and communication among students and with the teacher (Susi, 1989; Reid *et al.*, 1990; Edwards, 2000; Santrock, 2004; Muijs and Reynolds,

2005; Sztejnberg and Finch, 2006; Savage and Savage, 2009). In addition, the finding in respect of the importance of the communication between teacher and students, such as providing feedback and listening to students' opinions agreed with Reid *et al*., (1990), McLeod *et al*., (2003), Cottrell (2005), and Savage and Savage (2009).

6.6.3.2 Wall Displays

Eyes, ears and fingers are the main channels used to collect information from the surrounding environment (McLeod *et al*., 2003). Visual display is an important learning tool as visual information can be remembered longer by students than verbally presented information (Wolfe, 2001). The displayed materials that students see should be related to the subject being taught in order to allow students to make a connection between what they see and hear during a lesson. This will lead them to develop a better understanding of the topic and enhance their creative thinking and practices.

After the changes were made G2 and G3 in the classroom by adding new works and composing order of the displays, students expressed different impressions such as 'our beautiful class' and 'I like my classroom more since the change', and this positively enhanced their perceptions because students were encouraged to take pride in their artwork even if it was not of the highest quality. However, while it was anticipated that as displays were renewed the memory of the previous work may continue to have influence upon students' thinking and practices, interestingly there was no evidence from these student responses to support this, however they were not asked specifically about previous displayed work which could account for this.

Overly crowded and messy displays in an art classroom will negatively influence students' creative thinking and practices by confusing them with too many colours or themes. Busy displays either provide too much information (Ruscoe, 2008) or make students feel that their work is not so special e.g. students' work is lost in the crowd. Currently there is no complete guidance available to help teachers in spacing, aligning and curating displayed work. When displays were not regularly changed, it was anticipated that people would become desensitised to them, however none of the responses acknowledged this. Nevertheless, there is still considered to be potential

for students to become desensitised, and so a teacher should make efforts to engage their class by redesigning the display to give at the very least the same information in a different arrangement. It was observed that an art classroom with a display that was too 'busy' could overload student thinking and prevent them from developing their ideas, which is supported by the findings of Ruscoe (2008).

After the implementation of the wall display interventions G2, by re-organising the messy display in one classroom and adding more artwork to the other, this led to a more effective environment as described below. This improved students' perceptions of how they do their work, potentially stimulating them to be more creative, increasing their imagination to generate new ideas. These findings were in agreement with LaGreca (1980), Fisher (2005) and Ruscoe (2008).

A key element that was observed after the interventions was the students' changed perception of their own value, and the value of the artwork and their willingness to try new things. Pre-intervention, some of the art classrooms and schools in G2 appeared bare, with very few displayed materials or even a complete absence of displayed materials. Students saw that their work was kept in lockers, placed at the side of the room or even returned to them after evaluation by the art teacher. Therefore, they did not want to do more or try new things because they did not receive any appreciation or reward in the form of display of their works. Regularly changing the display gives all students a chance to display their work and gives students the feeling that the room often changes. Displaying students' work can give them confidence; they feel that they can do better next time and set themselves a challenge so they can take a risk to achieve more in future tasks. The teacher should care about the display of students' artwork, even if it is not of a high quality, because students differ in their abilities. Thus, the teacher will encourage students to develop creative thinking and practices. Therefore, the teacher should display student work even if of a low quality and this agrees with findings by Muijs and Reynolds (2001). Bruner (1977) argues that a lack of student confidence may cause him or her to be unwilling to try new things.

Art classroom displays should not only be for students' artwork. They should include information, instructions and examples. Each display has a different function and influence on both students and the teacher. The display of information and materials

related to the art subject can save time during lessons by reducing repeated questions related to basic information. This can allow the teacher to concentrate on the important points that need to be discussed. A variety of ways can be used to present the information as well as update information that relates to and supports the curriculum of the subject. In this research, it was noted that in Alibdaa which provided extra information related to the curriculum i.e. topics/tool use etc students were more confident as they had a clear understanding of the topics to be covered and the information displayed reduced the incidence of repeated questions with regard basic information.

The display should include some instructions related to the use of various materials and tools, and encourage students to work in a safe environment. Other display materials should encourage students and challenge them to try new things. Students' artwork gives the classroom its identity. It conveys a message to students that the room is a space for trying new things, and embracing creativity, new ways of thinking and changing their practice.

There were a variety of ways that the materials were displayed in the classroom according to colour, size and shape and primarily displayed student work, additionally it provided the functions of instruction or advice (such as the use of environmentally friendly products), and information. Therefore, the classroom became colourful and this enhanced the art classroom learning environment G2 and G3. A variety of displayed materials in the art classroom is very important. Therefore, the art teacher should present the display in different ways, using materials of different sizes and types. Students have different tastes; therefore, teachers should consider a variation of displayed materials to attract and visually stimulate as many of the students as possible, which is important for facilitating the development of creative thinking and practices. These findings relate to the influence of different methods of display in the classroom is in agreement with other studies (Sommer and Olsen, 1980; Loughlin and Suina, 1982; O'Hare, 1998; Wheeler, 2000; McLeod *et al.*, 2003; Ruscoe, 2008).

Observations of displayed artwork on walls and bulletin boards resulted in perceptions of a softer classroom environment for students, which increased the students' satisfaction level with their art classroom, and improved the learning

environment. These findings were in agreement with Sommer and Olsen (1980), Muijs and Reynolds (2005) and Ruscoe (2008).

In one of the selected schools, the 51st, the art classroom was shared between intermediate and secondary schools. Therefore, the display of secondary students' artwork may help some students of this level to try new things due to the higher standards and greater variety of the displayed secondary level artwork. However, student confidence and personality can be a factor, as some students were noted to be depressed, observed through their facial expression and comments during the session. This occurred because they did not see their work hung on the wall; and this arguably impaired their creative abilities.

Interventions made in the art classrooms also increased students' interaction with their environment. It developed their ability to discuss and analyse. With the rich attractive environment G2, the repeated and basic questions were reduced, because students were able to find the answer within displayed materials and thus they focused on questions that are more critical. An additional positive effect was that the teachers were motivated to teach better by their students' response to the well-decorated classroom. This finding is in agreement with Wollin and Montagne (1981). The effective setup of an art classroom display is an important factor that can stimulate students by encouraging imagination exploration, analysing, gathering information and having new experiences, which can encourage trying new things and enhance their creative curiosity and ultimately influence their practices.

The findings obtained by the questionnaire and observations in each intervention group, pre and post art classroom interventions, indicated that student's perceived that they were being enabled to improve their creative thinking and practices.

In summary: following the interventions to layout, the use of all table dimensions led to a more usable space for students to sit and do their work and also facilitated the exchange of tools and materials, and the access of students to art tools. The changes made in these classrooms led to a reduction in the noise level in the classrooms. This enhanced students' mood, concentration, interaction, communication and discussion. Arguably this led to greater exchange experiences, the generation of more ideas, the observation of others' work, and self-evaluation of their own work, which

encouraged them to try new things. In addition, interaction with the teacher was also increased, and this reflected positively in the students' relationship with their teacher. In respect to wall displays, the observations revealed that the display in art classrooms led to a rich, attractive environment that was colourful and stimulating for students, improved the learning environment, displayed students' artwork and encouraged them to take pride in their artwork. This then increased the students' satisfaction level with their art classroom and enhanced their enthusiasm to try new things. The display of information materials increased students' awareness in art such as the proper use of art materials and tools and led to new questions by students instead of repeating basic questions during lessons.

The findings in this research indicate that it is possible to improve perceptions of creative thinking and practices of adolescent girls in Jeddah, Saudi Arabia, by table and seating layout, and wall display, interventions within art classrooms.

6.7 Critical Review

In review of the whole programme of research from contextual review to intervention analysis, some lessons have been learned in how to develop a stronger research plan. For example, due to the distances involved in the field study work, where I visited schools in Jeddah, Saudi Arabia but then wrote my case material and findings in the United Kingdom, there were difficulties in contacting those schools or teachers easily because of time zone differences. So for anyone wanting to do a programme of research of this nature it is suggested that the research might be better managed as a distance learning programme from in the field.

Nevertheless, in this research there had initially been a number of visits made to intermediate schools in Manchester, UK, with the consideration of comparing Manchester and Jeddah schools. However, as the research plan was reviewed it became clear that such a comparative study would not fit well within the available timeframe of the full-time doctoral programme, and was not necessary to making a contribution to new knowledge. This is not to say, however, that such visits in the early stages of the research were not of benefit, they were of value in broadening my contextual perspective and helping develop my environmental awareness for my review of school environments in Jeddah.

6.8 Summary

This chapter discussed the importance of the data gathered from the observations, interviews and questionnaires, supported by relevant knowledge from the literature review. It described the sociopetal layout of tables and seating arrangement as well as display interventions selected and applied in three interventional groups including 'table and seating arrangement interventions group', 'wall display interventions group', and 'table and seating arrangement, and wall display interventions group'. In each group, the questionnaire and observations were used as tools to evaluate the influence of interventions to improve perceptions of creative thinking and practices in the art classrooms in intermediate girls' schools in Jeddah, Saudi Arabia. The discussions of findings enabled me to draw indicative conclusions concerning the importance of the art classroom environment in enhancing students' creative thinking and practices.

Chapter Seven: Recommendations for Future Research, and Practical Guide

7.1 Recommendations for Future Research

As a result of my research, the following recommendations suggest how further enquiry into use and development of the art classroom environment might improve students' creative thinking and practices. I include a short discussion of each point where necessary to highlight why I believe the area has value. Future research discussed below, has been grouped into themes: Influences; Shared Ownership; Technology & Resource; Effect of Location; Effect of Classroom Design; and Student Motivation.

Influences

- *Influence interrelation*: There are two areas of investigation that require further research. Firstly, the interrelatedness of classroom variables such as lighting, display, furniture and classroom dimensions. Secondly, the impact that these factors have on one another, for example, the impact that changes in lighting can have on the effectiveness of a display, in terms of influence upon creative thinking and practice.

- *Influence manipulation*: Is there is a general limit to how many variables can be manipulated in parallel before the benefit is no longer apparent? For example, if a teacher changes a number of variables in the classroom will this actually create greater impact on perceptions of creative thinking and practice than if she changes only one variable? What is the connection between the number of variables that are changed and effect that this has on students. This is important to understand because it will aid teachers in applying 'best practice' and the most effective strategies in the classroom to promote creative thinking and practice.

- *Influence duration*: Whether certain variables have a shorter period of influence than others requiring more frequent change? For example, table layout may have a continuous impact, whereas classroom displays may need to be changed regularly to keep students interested and motivated,

particularly if the students become disinterested quickly. After the interventions, I undertook follow up visits of the schools four months later. I found that the school in group 1 who changed the table and seating arrangement to 'grouping' had kept it. I also found some display changes where the teacher had replaced some of the students' artwork because the class had started a new project. This continuous changing of the displays seems to have maintained student interest. I would argue therefore that further investigation in this area will help the teacher to develop a deeper understanding of the persistence of impact of each variable.

Shared Ownership

Would involving the students in the classroom design decision making process especially promote creative thinking and practice? My research showed that the student cohort felt uninvolved in the classroom because they were not included in the decision making process. Susi (1989) argued that teachers can provide opportunities for students to enhance their involvement in classroom activities by involving them in decisions about the classroom environment, and considering students' ideas and suggestions, such as those related to furniture and classroom layout. I propose that as children and adults can have very different opinions on the best way to arrange a classroom, it is important to listen to students' opinions on how they would like their classroom to be set up because they can choose to place resources such as displays in the position that will be the most beneficial to them. For example, display height, and thematic matching. So, an investigation could inquire as to the impact in involving student opinion and ideas, and whether by such an approach students will be more likely to feel that it is their own environment because they were involved in organising it. This may encourage students to try new things.

Technology & Resource

There are two strands of research I would like to propose under this theme. Firstly, use of technology and secondly, additional resourcing within the classroom in the form of a library.

- Investigating to what extent we can use technology in the art curriculum, and what benefit this will have for students, teachers, and the delivery of the curriculum itself. I propose that considered use of technology may help to overcome a number of issues in this learning context which I discuss below.

1. Would the availability of PC's in the classroom encourage creative thinking and practice, and inspire/motivate students to make the best possible use of their lesson time, or would it quickly become an accepted norm? Technology can help the teachers to find many resources, and increase the awareness of new tools and materials in the art classroom (Heise and Grandgenett, 1996). So it is argued that the inspirational 'newness' available through PC's, as technology, is actually a result of the constantly developing content of the Internet.

2. Considering the constantly developing depth and breadth of Internet content, would the availability of PC's in the classroom really help teachers to plan lessons effectively in introducing new techniques?

3. How do PC programmes benefit learning experiences, beyond what could be engaged with if the class environment had no PC's?

4. A PC enables teachers to access CD ROM resources for lesson context, with many diverse examples of artwork to show students, in order to demonstrate new artistic approaches and techniques. So the question is what is the best guidance in managing such resources for improving creative thinking and practices?

5. In what new ways can technology enable the teacher to provide additional educative experiences within the Saudi Arabian legislative framework? As Saudi Arabian schools are separated by gender which would preclude a male artist visiting in person, flexible use of a video link or smart board would allow students to gain the benefits of outside expertise without contravening the law.

6. The technology can cover for the limitations of cultural learning and sharing of ideas, and inspiration, where students would otherwise be unable to take school trips out for cultural reasons which have made these difficult to arrange for Saudi Arabian girls' schools; even if such visits are allowed, only a few outstanding students who received high grade point average (GPA)

scores in all subjects can take part. All students have a need to expand their horizons through such visits; and adroit use of technology may overcome this barrier, for example, 3D computer tours which allow the student to get a better feeling for a place without visiting in person. So the future research opportunity here could be to compare learning experiences between physical and virtual visits.

- Would the existence of a specialised art library in each classroom/school promote creative thinking and practice? This is an important area for further research as I observed that most school libraries only had a small selection of books on art that were quite general and not particularly relevant to curriculum. An art library organised by the teacher that is related directly to work being undertaken is likely to give the students an opportunity to increase their awareness of art, provide a resource for new ideas which promotes creative thinking and practice during the session, or at home when the books are borrowed.

Effect of Location

There are a number of investigative strands with regards to the topic of 'Location' that require further research which I split into four different but interrelated sections.

- My research showed that art teachers in Jeddah felt that by holding art classes outside of the classroom for example in the playground, encouraged students to try new things. However, further research is required into whether changing the physical environment and location of a class would bring about these benefits. I believe problems of heat in Saudi Arabia where the average temperature summer temperature is 45°C may adversely impact this kind of lesson planning and counteract the possible positive benefits, unless portable environmental controls are developed perhaps, e.g. canopies.
- Many of the art classrooms in schools I visited looked out on what could be described as uninspiring vistas, for example the walls of other buildings or other classrooms. Kaplan et al (1988) suggest that a factor that may stimulate students to be more creative when doing their art task is having access to a view from the window of natural phenomena such as grass, trees and the sky,

or wall projection of another environment. Further research into this area could inform school design in new builds and aid allocation of classrooms in existing facilities so that there is a better fit and utilisation of space.

Effect of Classroom Design

- Accepting that, the size and type of the furniture in the art classroom that is suitable for students aged 12-15 varies dramatically as a result of the differences in rates of development, I identify two areas for further research.
    - Firstly, can all furniture be standardised, or is it indeed necessary, as I have observed in my field research, to use a mixture of sizes and shapes in order to accommodate students comfortably?
    - Secondly, what type of furniture is required specifically for individual art classrooms and the curriculums that are studied therein?
- I propose that when selecting classroom furniture, it would be useful to investigate the impacts of flexibility and mobility of art classroom furniture which can enhance students' creative thinking and practice.
- Cromwell (1993) highlighted the importance of establishing a school with a structured yet flexible environment that encourages and supports imagination-expanding activities to encourage trying new things. The presence of flexible and mobile furniture facilitates movement and can accommodate different types of activities, such as placing mats in the centre of the classroom to create a comfortable space that will allow drawing whilst sitting on the floor. One way in which this space utilisation could be achieved would be the creation of different zones within the classroom, for example, a quiet zone, a thinking zone and a discussion zone. This would allow students to choose the environment that is the most conducive to their own creative process. It would be useful to research the impact and benefit of this to students of this age, because their artistic thinking develops at different rates and in very different ways which can enhance creative thinking and practice individually.
- The decoration of classrooms was observed to be diverse. An investigation of the influence of decorative ornamentation and use of plants, and toys, in the

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learning environment could inform of their significance to student stimulation.

- What colour is most appropriate for decorating art classrooms', e.g. the walls in terms of how well they compliment the display, students' concentration levels, and the general appearance of the room. Also, the impact it has on students' satisfaction levels with the room itself, in terms of the colours that female students like and the impact this can have on other classroom variables such as the display. I observed during my research that art classroom wall colour was varied such as: light green, yellow, white, and pink. I found that from my questionnaire results students in an art classroom with a pink wall colour prefer it more than students in an art classroom with a light green wall colour. Most of the schools which I visited at the beginning of my research use light green and therefore bearing these subjective results in mind, I recommend further investigation of this area, to discover what colours are most suitable in different contexts within the art classroom environment.

Student Motivation

It would also be useful to investigate the effect on students of 'motivational phrases' which are displayed around the classroom or directed specifically at them, referring to creative and critical thinking; for example "You are creative", "You can do it", "Continue to Question" and whether these have a strong impact on the student learning experience.

7.2 Practical Guide

There are limited books and scientific resources related to 'Art Education' and a shortage of specific references related to the art classroom environments in Saudi Arabia. I have therefore written this brief practical guide for the art educator, which could be used in the set-up of more effective art classroom environments. It is written without the inclusion of references, to be found elsewhere in this thesis, because an academic style of writing was not seen to aid the practical nature and intent of the guide which will be provided separately to teach in Saudi Arabia. I gathered together a set of influencing factors for consideration with regards to suitable art classroom

environments for creative thinking and practice, from my review of associated literature in conjunction with my own findings.

Within the limitations of this study, the following points were concluded:

Building upon other's prior research I found that the art teacher is the key person in controlling the art classroom environment. Therefore, they should carefully organise their classrooms considering size, furniture, student number, and activities to ensure suitability for students and allow them to put their learning into practice. Some teachers may be unaware of how to maximise the benefits of the resources that already exist in their classroom. Therefore, an instructional guide, which directs teachers on how to arrange a classroom as effectively as possible, would arguably help to reduce this problem.

My observations noted that art teachers can guide students through the creative process by participating in the class work themselves. This will allow students to have the opportunity to observe the teacher making mistakes and rectifying them; before going on to produce a refined work of art through this process. Students will be motivated to follow their teachers' lead and will gain the confidence to try new things. They will be able to visualise how different approaches can produce diverse and often improved outcomes. An art teacher should ensure that that students have started with the set task before allowing the students freedom to develop their work in the direction that they wish; and that will make them feel that their work is valuable and try different strategies to achieve the desired result.

The questionnaire responses from the students showed that art was seen as important and of interest to them. A challenge for teachers is to create art classroom environments which are favourable for students. This requires an understanding of how to utilise students' background, knowledge, and how to motivate them to try new things in their work or other activities. Otherwise the students might gradually lose their interest in art, particularly bearing in mind the characteristics of adolescents who arguably learn more by doing than by just seeing or hearing during this uneven transitional stage between childhood and young adulthood.

In the art classroom, as discussed in the contextual review and my own observations, sufficient personal space is required in order for students to be able to move around their work and also to manipulate the work itself. This will allow them to consider and arrange their tools so that they have easy access to them and aid the organisation of their work-area i.e. they will be able to keep them tidy. Access to different tools can increase their opportunities to try new things and techniques. If students have to continually re-arrange their work- area to find materials or create more space, they will likely not be able to give their full attention to their art-task.

Previous research has shown that everything in a classroom, such as displays, layout, and other items requiring organisation; sends a message to students about the type and standard of behaviour and activities which are expected in such a classroom. Therefore, the teacher must carefully consider the impact that these factors will have upon them both individually and collectively, when arranging the art classroom. The art classroom must clearly define itself as different to general classrooms and require a different behaviours and practices.

Previous research has shown that each factor in the art classroom environment is interconnected with other factors influencing students thinking and practices. It is arguable therefore that changes in any factor may influence other factors. So if a teacher is able to optimise the arrangement of their classroom, they can organise the furniture so that students have more space to work in; and the teachers will then have more room to monitor and give valuable feedback.

Previous research highlighted the importance of classroom ventilation and temperature. Students spend 90 minutes inside their art classroom during each art session; and therefore, ventilation is required for a number of reasons. Firstly, poor air quality will increase potential for health problems for both students and teachers because some materials give off fumes. Secondly, a hot classroom with limited airflow is arguably going to have a detrimental impact on concentration.

Lighting is required in the art classroom so that students have sufficient illumination to enable the tasks they are doing, which can be very finely detailed, to be engaged with without straining eyesight. Daylight and artificial light can also have different effects on student artwork. The same colour can look slightly different when exposed

to daylight compared with how it looks under artificial light. Students may elect to use a certain colour in the classroom but when the work is moved to a different location for display purposes, it can appear to have a different quality. This could cause students to become dissatisfied with their work, which they may perceive as having lost value, or conversely, they may feel that the work has been enhanced. In either case, I argue that it would be better for student self-esteem if their appraisal of their own work remained regular.

Noise in the art classroom affects both the students and the teacher. This noise can be caused by a number of sources such as air conditioning systems, students shuffling their seats and tables, the noise created by students speaking and everyday noise from outside the classroom. As a result of this noise, students will not be able to concentrate well or properly hear the teacher's explanations, instructions and feedback.

Researchers have demonstrated that colour is an important component of design and it can affect behaviour. The selection of correct colours for the classroom walls can affect both teachers and students. It can relax the eyes, create better visibility, provide a good view of the displayed materials on the wall, and give the classroom a different appearance. From my observations it became apparent that in one school, where the art classroom walls were painted dark yellow, students and the teacher were dissatisfied with the colour and how it limited what could be done well within the classroom. This was because the colour did not create a pleasurable atmosphere in which to work and clashed with displayed work.

Previous researchers have highlighted the importance of the location of work space with regard the view outside the classroom and the impact it has on productivity. This also impacts the management of other variables such as lighting and ventilation. The head teacher must therefore consider the choice of classroom location as a school facility to support their teaching staff and improve student experience.

My observations and previous research highlight that the selection of furniture for art classrooms requires the consideration of ergonomic suitability i.e. age, gender, body sizes and the nature of class activities. It should also be flexible and mobile. This will help the teacher to arrange the classroom effectively; and specific to activity,

increasing students' ability to try new things during art tasks. This is particularly important as applying an unsuitable layout for this furniture has been shown to decrease its functionality.

Selection of table and seating arrangements could reduce or enhance teacher-students movement, monitoring, communication, individual contact, assistance, and feedback for students during art sessions. In particular my research has shown that, the U-shaped table layout which is used in some art classrooms in Jeddah, Saudi Arabia is not appropriate in small sized classroom with large numbers of students. It reduces personal space; and causes overlapping and crowding; as well as an increase in noise during the art session. It can be argued that this negatively influences teacher-student as well as student-student movement, relationship, mood, and cooperation during lessons. It also effects student concentration during the lesson and this may result in them missing of a lot of information that can help them to perform their tasks, which then reflects negatively on their creative abilities.

Consideration should be given to the different methods and diversity of artwork display, such as hanging on the wall, ceilings, on the shelves, framing, and the display of sculptures which can then encourage students because they may have range of different interests. This has been shown in both previous and my own research. The display of lesson related material has a different function and influence on both students and the teacher. The display of student artwork arguably will give them confidence, whereas displaying materials related to the curriculum (information, instructions) supports the goals of art education and this eradicates the need for teachers to constantly reiterate basic teaching points. Display material that gives students the message that this environment is safe, and that it encourages them to try new things by suggesting there is openness to new approaches. However, messy displays can confuse students, accumulate dust, affect movement, and give a feel of crowding and students will disregard them as if they are of little value.

The regular change of displays gives students the feeling that the room is always different; gives a chance to display most of the students' work; gives students confidence; and sets them a challenge so they can better take risks to achieve more in future tasks. However, the display will only fulfil its potential if the teacher has

positioned it effectively, by taking into account factors such as the position and selection of the display, the background colour of the walls and the effect of lighting.

The art classroom requires additional equipment facilities, tools, and materials and arguably more so than other classrooms for enhancing students' engagement with creative thinking and impacting on their practice. This includes things such as sinks, computer stations, storage shelves for non-completed work and a first aid kit etc.

My observations have shown that the presence of sink(s) in the art classroom will allow both the students and the teacher to clean their hands to avoid health hazards caused by the use of non-safe art materials, and also aid the cleaning of tools for re-use in different activities. The absence of classroom sinks may lead students to use the school sinks outside their art classroom, which waste lesson time and disturb other classes. The lack of access to sink(s) arguably constrains student engagement with materials.

Previous research and my observations have shown the use of different teaching tools and use of technology can help teachers to improve the quality of teaching, explain the art topic in an interesting way, solve some problems such as limitations of school trips in girls' education and lead to a broader world view for students, giving them more opportunity to be creative and try new things. Teachers can find many resources related to curriculum, and increase the awareness of new tools and materials in the art classroom in addition the use of technology in art sessions will stimulate the attention of students, and increase their interest in the subject. It will arguably allow access to the most up to date information and valuable artistic experience, communication with others, learning about art in different cultures, sharing of ideas, and inspiration, and access to museums and galleries.

Libraries in art classrooms can improve student knowledge of art, provide a resource for new ideas which help them during the session, or at home if the books are borrowed. This might overcome a number of problems that students usually find when acquiring art resources, namely that they often are hard to find, very expensive and frequently inappropriate for their level of study.

From my research, I noted variations in students' satisfaction with the art curriculum in respect to trying new things in art tasks. This was arguably owing to differences in student knowledge, experience, and background. The teacher can tackle this problem by modifying the curriculum to accommodate the available facilities, making it supportive of creative thinking and practice. However, the success of this strategy will be largely dependent on teachers' experience knowledge and understanding of creativity and creative learning so it would be useful for them to have assistance in this process from the educational authority, in the form of training or guidance.

This guidance, translated into Arabic, will be used to inform best practice in terms of classroom design, and lesson planning, to improve student perceptions of creative thinking and practices.

Chapter Eight: Conclusion

Art has existed across many cultures over many generations, and art education serves to enhance awareness and understanding of our culture as well as other cultures. Supportive art classroom environments enable students to develop their perceptions of creativity, to communicate better, and to become better able to express themselves, including passing these perceptions on to the next generation. Such support will not be effective if only an initial effort is made to facilitate a new learning experience. There will need to be continued investment in development of the learning environment and practices within it to maintain creative learning.

This study investigated students' perceptions about their art classroom environments which either stimulate or inhibit the development of creative thinking and practices, in girls' intermediate schools (12-15 years) in Jeddah, Saudi Arabia. Direct observation of these art lessons, interviews with art teachers and students, questionnaires, and changes to the classroom environment, enabled me to discover the value of the selected influencing factors in the art classroom environment. The findings from all stages of this research informed my research question: *Is it possible to improve perceptions of creative thinking and practices, of adolescent girls in Saudi Arabia, through control of art classroom environments?*

The research methodology considered a number of tools for investigating the influences on perceptions of creative thinking and practices. In addition to the frequently used tools of questionnaires, interviews, tests, and interventions, behavioural mapping was considered to provide a very useful approach to observation in the classrooms. It was decided not to use creativity tests as this would have required interference in the teaching plan for lessons, and would not have effectively indicated changes in perceptions. The behavioural mapping method used was considered to compliment the questionnaire methods pre and post intervention study. It was considered necessary to carry out interventions because if the research had relied upon non-intervention perceptions it would have only monitored change of opinions of people with little experience of actual change. This relates to the argument that the customer does not always know what they need next, till they see it. Teachers and students may not appreciate how certain changes influence their

perceptions until they have experienced those changes. So without three interventions the research would have been unable to substantiate the impact of change. Without behavioural mapping the questionnaire responses would likely have lacked physical contextualisation beyond the classroom environmental layout, and without the questionnaires the behavioural mapping would have lacked the externalised perceptions which helped interpret the behaviours.

In overview of the indicative findings: the 'Sociopetal Grouping' of table and seating gives more space and allows the teacher to assist and give feedback to students. These arrangements also enable students to have more interaction; communication; co-operation; discussion; exchange of experiences; leading to generation of more ideas; new methods of helping each other; and evaluating their own and peer work. Perceptions of change from a sociopetal perspective provide an understanding of the possible impact of the learning environment on the students' experiences which in turn improves perceptions.

Displaying student's art work on the walls improved the art classroom learning environment. Students expressed greater levels of satisfaction and pride. Their artwork led to increased levels of discussion and improvements to perceptions of creativity. The display of work acts as a reflective curation of the thinking and doing through the examples of artwork promoting critical discussion. The layout of the display including negative space can be quite crucial to focusing the students' attention on specific pieces of work, but also the overall message and extending boundaries of trying new things across the display of works.

Changing two variables i.e. both table and seating arrangement and wall display did not significantly increase the impact above what was found with manipulation of a single variable, in this particular combination. The mean mark for manipulating two variables was only marginally higher than manipulating one factor. The reasons for this are arguably due to the selection and mix of manipulations which led the students to be more effectively influenced by the changes to single, higher-impact conditions, i.e. one change is easy to appreciate, but two or more changes may distract, overwhelm, or students may become easily desensitized to them.

It is important that research involving interventions, as well as design developments, are not simply left as a finished job once the main programme is over. Researchers and designers, and their clients, benefit from time invested in remaining engaged with the continued life of their work. As part of this programme of research a number of follow-up visits were made to the schools in Jeddah. These schools reported the benefit of having been involved in this research and showed how the practices of table and seating arrangement, and wall display, modification were still continuing.

In conclusion of this programme of research, the two contributions to new knowledge in terms of art classrooms in intermediate girls' schools in Jeddah, Saudi Arabia have been:

- Developing a research process for identifying and testing environmental influences upon the perception of creative thinking and practices.
- Evidencing how table and seating arrangement, and wall display, can improve perceptions of creative thinking and practice in Jeddah, Saudi Arabia.

These contributions to new knowledge build upon what has previously been understood in this context of inquiry and development because it has applied a selection of Western principles of classroom manipulation specifically into Jeddah art classroom environments, where it had not been carried out previously. The outcome has been to inform this culture of possible new ways of investigating and of proposing best practice in improving perceptions of creative thinking and practices.

Appendices

Appendix 1: A booklet developed in Arabic language about the content and importance of the art classroom environment.
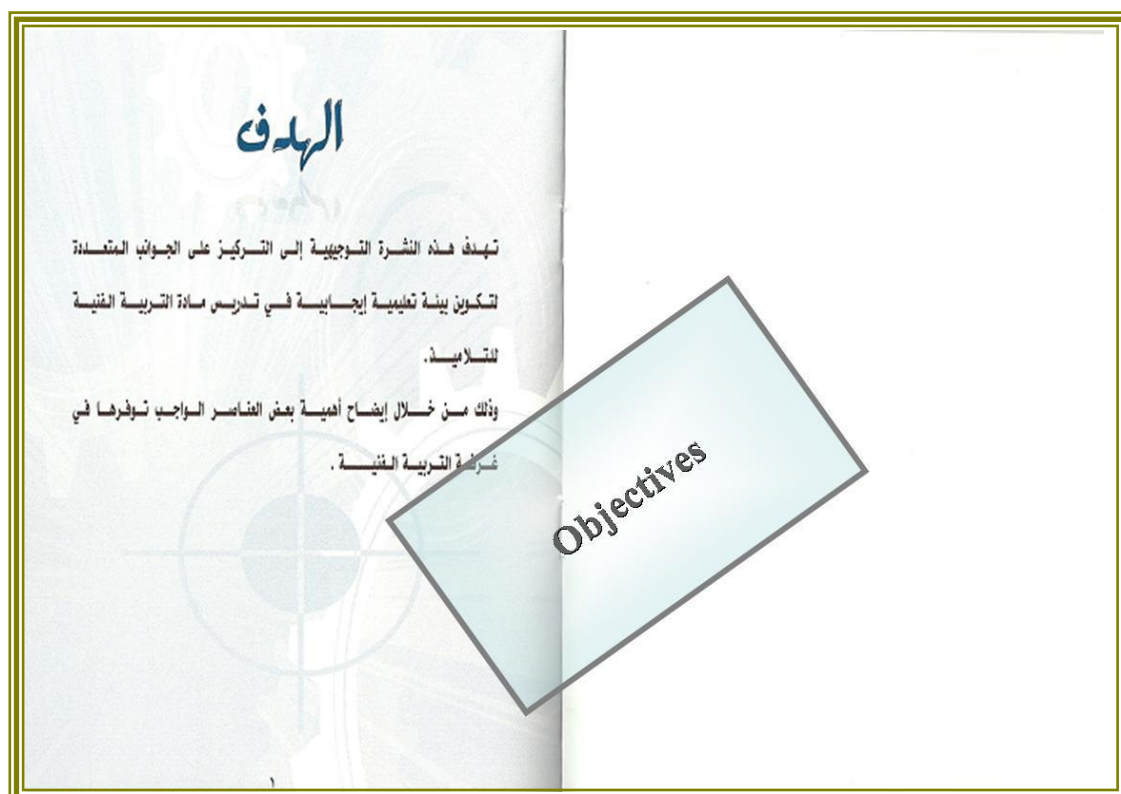
ما معنى البيئة؟

كلمة بيئة تعني كل شيء حولنا ويؤثر في حياتنا.

أما بالنسبة للبيئة المدرسية فهي عبارة عن جزئين.

* الجزء الأول هو الجزء الثابت مثل البنايات وغيرها من المعالم المعمارية.

* الجزء الثاني وهو الجزء المرن والخاص بالعناصر التي من الممكن ترتيبها وإعادة تنسيقها مثل الأثاث والديكور.

ويساهم تفاعل ... مع العوامل البيئية سلبيا أو إيجابا على خبراتهم التعليمية، في حين أن ... منها لها تأثيرها على سلوكهم.

كما أن كل منها لها القدرة على الاستجابة ولها خصائصها ووظائفها . (٢)

(١) - Loughlin C & Suina J (1982)The Learning Environment: An Instructional Strategy

موقع غرفة التربية الفنية

لموقع غرفة التربية الفنية أهمية قصوى فيجب اختياره بدقة مع مراعاة الآتي:

* مناسبة الغرفة وتوفر الشروط الصحية فيها.

* توفر وسائل الأمن والسلامة بالغرفة.

* سهولة الوصول إلى المكان.

* بعد المكان عن الفصول الدراسية ولابتعاد عن مصادر الضوضاء والإزعاج.

* يجب أن تكون مساحة الغرفة مناسبة لعدد التلاميذ وكافية لممارسة أوجه النشاط الفنية المختلفة مع مراعاة الفئة المستهدفة من التلاميذ.

* مرونة المكان وسهولة التعديل والتغيير فيه.

* مراعاة الناحية الجمالية بالمكان.

التهوية ودرجة الحرارة

التهوية هي عملية تجديد الهواء.

حيث أن عملية التهوية للفصول هامة للغاية ويجب أن تتم هذه العملية باستمرار للحصول على الهواء النقي من مصادره.

وللحصول على هواء نقي في الفصول الدراسية يفضل أن تتم التهوية من ٢-٤ مرات في الساعة.(٣)

فالتلاميذ يقضون معظم أوقاتهم داخل المباني المغلقة.

ونوعية الهواء داخل المبنى قد يكون أكثر تلوثاً من الهواء الطلق بالخارج.

حيث أن رداءة التهوية داخل الغرف ... يزيد من معدلات الإصابة بأمراض الحساسية أو الجهاز التنفسي مثل الربو والالتهابات ... كذلك يؤثر ... والطلاب للمهام التي تنطوي على التركيز الذهني.(٤،٥)

كما يجب أن تكون درجة الحرارة داخل الفصول الدراسية ... للتلاميذ ... تكون حارة مما يؤثر على التركيز ولا تكون كذلك باردة فتسبب لهم الأمراض المختلفة.

(١)- McMillan B (2003), Environmental Science in Building context, Palgrave Macmillan. p64
(٤)- BBC NEWS (2002). Pot plants help pupil... http://news.bbc.co.uk 1 /hi/education/2123374.stm [Date accessed: February 2009]
(٥)- Fisk W (2000). Health and Productivity Gains From Better Indoor Environments and Their Relationship with Building Energy Efficiency Annu. Rev. Energy Environ. 25-537-66

الضوضاء

الضوضاء مفهوم نفسي يعرف بأنه كل صوت غير مرغوب فيه.

فالضوضاء المفرطة يمكن أن تسبب مشاكل صحية مختلفة مثل فقدان السمع وضغط الدم المرتفع. ويمكن أن يؤثر سلبيا على أداء الشخص(٦).

والضوضاء قد تزيد من شعور الطلاب بالإجهاد، وتضر بتركيزهم وتؤدي إلى خفض مستوى التعلم لديهم.(٧)

وهناك العديد من العوامل التي تسبب الضوضاء في المدارس كالملاعب، والممرات، ونظم التهوية، واحتكاك الكراسي وطرق الأبواب، والتلاميذ أنفسهم.(٨)

لذا يجب الابتعاد عن أماكن الضوضاء ... الطالب على التركيز وأداء عمله بإتقان.

(٦)- Lebo C and Oliphant K (1986). Music as a source of acoustic trauma. Laryngoscope, 78: 121-18.
(٧)- Scott, E (1999) Sound Decisions improve learning. American Schools and Universities http://asumag.com/mag/university_decisions_improve/[Date accessed: Jun 2007]
(٨)- Day C W (1999). Sounding off. American schools and Universities. http://asumag.com/mag/university_sounding_off/index.html [Date accessed: February 2009]

الإضاءة

للإضاءة دور هام جدا في أي قاعة من قاعات الدروس وخاصة في فصول التربية الفنية، حيث أنها تلعب دورا رئيسياً في البيئة التعليمية.

ويجب توفر الإضاءات المتحركة داخل غرف التربية الفنية للاستفادة منها في بعض الأعمال التي تحتاج إلى دقة في العمل لذا يجب أن يتم اختيار الإضاءة بعناية فائقة.

كما أن توفر مصادر الضوء الطبيعي لغرف التربية الفنية يساهم في راحة التلاميذ ودقة العمل.

كما يجب أن نأخذ بالاعتبار كثافة الإضاءة وحرارتها خصوصا في فصل الصيف لأنها من الممكن أن تؤثر سلباً على التلاميذ والعمل على حد سواء.

Lighting

الألوان

اللون عنصر هام في التصميم فلكل فرد منا ألوان يفضلها عن الأخرى ولكن بشكل عام يستجيب الناس بشكل متشابه لمجموعات الألوان باختلاف بيئاتهم الثقافية(٩).

فلكل مكان ما يناسبه من الألوان فعلى سبيل المثال ألوان الحوائط للفصول الدراسية يجب أن تكون مناسبة لأعمار وجنس التلاميذ فاختيار الألوان المريحة للنظر تساعد التلاميذ على الشعور بالراحة وبالتالي تؤدي إلى إنتاج فني أفضل كما تضيف روح جيدة للمعلم، وتوفر مظهر جمالي جيد للأعمال الفنية المعروضة على الحائط.

ويفضل أن يكون سقف الفصل أبيض أو قريب من البياض ليعكس الضوء(١٠).

كشفت دراسات سابقة عن دور الألوان في حوائط الفصول الدراسية وكذلك ألوان الأثاث المستخدم بالفصل وتأثيره على أداء وسلوك الطلاب بشكل إيجابي أو سلبي(١١)، فاللون الأخضر باختلاف درجاته لون متناسق فهو مشابه للديكور الكلاسيكي لتنمية المهارات، ويستخدم في المدارس لإعطاء الراحة للتلاميذ واعطاء بيئة آمنة، ويشعرنا بالطبيعة والاسترخاء في أماكن مثل الحقول والجبال(١٢)، (١٣)، واللونين الأصفر والبرتقالي يعتبران من الألوان المحفزة للنشاط والحيوية في الغرف.

أما بالنسبة للون الأبيض فيعطي الانطباع باتساع المكان والنقاء(١٤).

Colours

(٩)- Nielson K and Taylor D A (2002). Interiors: An Introduction. 3rd ed., McGraw-Hill College
(١٠)- Barren F (1988). Light, color and environment. 2nd ed., Schiffer Publishing Ltd, p64
(١١)- Kennedy (2005). Classroom color. American School and University http://asumag.com/.../university_classroom_colors [Date accessed: December 2008]
(١٢)- Grant-Hays B and Mike K (2003). Color in Small Spaces: Palettes and Styles to Fit Your Home, McGraw-Hill, p30
(١٣،١٤)- Gibbs J (2005). Interior Design, Laurence King Publishing Ltd, p127, 100, 127

المقاعد الدراسية

توجد عدة أشكال تنظيمية للمقاعد الدراسية داخل الفصول الدراسية حيث أنها تعكس تأثيرات متعددة على تفاعل التلاميذ مع بعضهم وكذلك المساهمة في سهولة التواصل بين المعلم والتلاميذ. وهناك ثلاث طرق معروفة لتنظيم المقاعد في الفصول الدراسية كما يورد ذلك (١٥):

* التقليدية وتكون بشكل صفوف.
* حذوة الحصان أو حرف U.
* المجموعات.

ولكل نشاط ترتيبه الخاص مما يسهل من مشاركة التلاميذ وتفاعلهم فعلى سبيل المثال شكل حذوة الحصان أو حرف U مفيد لأنه يساهم بالمناقشة الفعالة.

في حين أن الترتيب بشكل مجموعات مفيد جدا في تفاعل وتبادل الخبرات بين التلاميذ والتلاميذ فيما بينهم خلال مراحل العمل الفني(١٦).

Seats

(١٥)- McCorskey J. and McVetta R (1978). Classroom Seating Arrangements: Instructional Communication Theory Versus Student Preferences. Communication Education, (27): 99-111.
(١٦)- Sztejnberg A and Finch (2006). Adaptive use patterns of secondary school classroom environment. Emerald Group 24 (20): 490-509

الأثاث

إن شغل أي حيز باثاث غير مناسب ومرتب يعطي شعور بعدم الرضى وعلى العكس فالأثاث المختار والموزع بطريقه صحيحة يعطي شعور بالجاذبية والراحة لأي مكان.

ويجب مراعاة وظيفة وأهمية كل قطعة مستخدمة من الأثاث والابتعاد عن وضع الأثاث الغير مستخدم داخل غرف التربية الفنية.

وينبغي مراعاة النقاط التالية:

* أن يلائم الأثاث أعمار التلاميذ.
* أن يكون مصنوع من خامة جيدة.
* توفير العدد المناسب من الأثاث الكافي لعدد التلاميذ.
* ملائمة الأثاث لطبيعة النشاط الفني الذي يمارسه التلاميذ.
* مرونة الأثاث لاستخدامه لأغراض متعددة.
* سهولة تنظيف الأثاث وتحريكه.
* توفر كلا من عنصري الأمان والأثاث.

Furniture

التخزين

توفر وتنوع وحدات التخزين داخل غرف التربية الفنية يعد أمراً هاماً وضرورياً لتوفير الأمان والراحة والترتيب أثناء استعمال الغرفة (١٧).

ويجب مراعاة النقاط التالية:

* توفر العدد المناسب من الوحدات للتخزين.
* تستخدم هذه الوحدات لتنظيم الأدوات والخامات وهناك نوعين من الخزائن، المغلقة لحفظ المواد الخطرة والأخرى مفتوحة على شكل أرفف وتستخدم لتخزين المواد الأقل خطراً وهناك خزان صغيرة ومقسمة لحفظ الأدوات الصغيرة والحفاظ عليها من الضياع.
* أن تكون قابلة للتعديل لها من حيث الارتفاع والانخفاض حسب الحاجة.
* سهولة الوصول لها وأن تكون في مكان مناسب داخل الفصل.
* توفر رفوف مسطحة لحفظ الأعمال ويمكن أن تكون مصنوعة من مادة مثل البلاستيك لكي يسهل تنظيفها لأنها سوف تستعمل للأعمال الغير مكتملة فبعض المشاريع تحتاج وقتاً لتجف أو يكون تحريكه حرج سواء كانت بالتجميع او بالصمغ.
* وتستعمل كذلك لحفظ الأعمال الكاملة تمهيداً لتثبيتها في غرفة التربية الفنية أو ممرات المدرسة أو حتى تقييمها وتقييمها للتلاميذ.

(١٧)- Sorrei K (2005). Space and light, Mitchell Beazley Octopus, London

العرض

طريقة العرض تحدد هوية المكان لذلك تعتبر طريقة العرض بالنسبة لغرف التربية الفنية أمر هام من عدة نواحي، منها إعطاء التلاميذ إحساس بالثقة بأن أعمالهم جيدة وجميلة وأيضا إضافة ناحية جمالية للمكان.

وهناك طرق عديدة لعرض الصور والأعمال الفنية فليس بالضرورة أن تكون مثبتة على الحائط فعرض مجموعة من الصور الصغيرة والأعمال المجسمة على الرفوف هو أيضا طريقة فعالة جدا (١٨).

ويجب مراعاة الآتي عند عرض الأعمال الفنية:

* اختيار الأعمال الفنية الجيدة والابتعاد عن التكرار.
* التنوع في الإخراج الجيد للقطع الفنية.
* أن يكون مكان و مستوى عرض الأعمال مناسبة لأعمار التلاميذ.
* توخي السلامة والأمان واختيار الطريقة الصحيحة للعرض.

(١٨)- Wheeler K (200..) living with art, Carlton Books Limited, pp22, 34, 84, 152

المرايا

لغرف التربية الفنية طابع خاص يميزها عن غيرها من الفصول الدراسة العادية ومنها تواجد المرايا داخل غرف التربية الفنية والتي توفر العديد من الفوائد من أهمها:

* أنها تعطي الإحساس بمساحة أكبر للغرفة.
* تمكنك من مشاهدة جميع زوايا العمل بالنسبة للأعمال المجسمة.
* تعكس محتويات الغرفة.
* تزيد من عملية الضوء من خلال وضعها بطريقة و أماكن مناسبة.
* مراعاة السلامة وأن لا تكون ذات زوايا حادة.
* سهولة التنظيف وأن لا تعيق حركة التلاميذ.
* تكثر من الناحية الجمالية بالغرفة.

النباتات

لوجود مجموعة من النباتات الصغيرة داخل غرفة التربية الفنية أو خارجها أهمية كبيرة وفوائد عديدة منها:

* المساهمة في تنقية الهواء وتحسين أداء التلاميذ وتحسين إحساسهم بالراحة من خلال تحويل ثاني أكسيد الكربون إلى الأكسجين بالمكان، وبالتالي تحسين نوعية الهواء (١٩).
* إحساس التلاميذ بالمسؤولية عند إسناد مهمة العناية بالنبات لهم.
* إضافة ناحية جمالية وراحة للنفس والنظر.
* إعطاء إحساس بالرضى وزيادة الإنتاج وخاصة إذا كانت النباتات داخل المكان أو إمكانية رؤيته من الخارج عن طريق النوافذ (٢٠).

(١٩)- BBC NEWS (2002). Pot plants help pupils bloom. http://news.bbc.co.uk/hi/education/2123374.stm [Date accessed: February 2009]
(٢٠)- Kaplan S, Talbot J F and Kaplan R (1988). Coping With Daily Hassles: The Impact of Nearby Nature on the Work Environment. USDA Forest Service, North Central Forest Experiment Station, Urban Forestry Unit Cooperative Agreement.

الستائر

الستائر يمكن أن تكون واحدة من أهم السمات الجذابة للنظر في الغرفة، ويمكن أن تكون هي نفسها عمل فني باستخدام مواد وخامات مختلفة مثل شرائط وغيرها [٢١].

* يجب أن تتوافق الستائر مع الأثاث.

* حجم الستائر يجب أن يكون مناسبا لجعل المكان مضيء، وينبغي أن تخفف من شدة الحرارة وضوء الشمس، ولكن لا تمنع ضوء النهار تماما.

* من الممكن أيضا الاستفادة منها كلوحات فنية بالرسم عليها أو استعمال خامات مختلفة لصنعها.

Curtains

(٢١)- Wheeler K (2000). Living with art, Carlton Books Limited, pp22, 34, 84, 152

حوض الغسيل

تواجد الحوض مهم جدا في غرف التربية الفنية حيث يستخدم التلاميذ خامات وأدوات مختلفة وأحيانا ضارة مما يسمح للتلاميذ غسل أيديهم بعد القيام بالعمل والمحافظة على النظافة الشخصية. كما أنها تختصر الوقت حيث أن الغرفة الخالية من الحوض يضطر التلاميذ لاستعمال الأحواض الخارجية مما يؤدي إلى الفوضى وضياع الوقت وقد يتكاسل التلاميذ بالذهاب وتبقى أيديهم غير نظيفة.

وأيضا للحوض أهمية في تنظيف الأدوات بعد الانتهاء من العمل مثل فرش الألوان وغيرها.

ويجب مراعاة التالي:

* اختيار المكان المناسب للحوض.

* نظافة الحوض وعدم ترك المخلفات الضارة حوله.

* وضع بعض الإرشادات والنصائح المفيدة التي يستفيد منها التلاميذ أثناء استعمال الحوض.

* كما يجب أن يناسب حجم الحوض وارتفاعه للتلاميذ.

Sink

المكتبة

للمكتبة أهمية كبيرة ودور فعال في الفصول الدراسية وخصوصا غرف التربية الفنية.

وتبرز أهميتها للتلاميذ والمعلم حيث انه يستعين فيها في توضيح بعض الدروس وتمكن التلاميذ من الاطلاع والمعرفة وزيادة خبرتهم الفنية لذلك يجب مراعاة الدقة في اختيار الكتب المناسبة للتلاميذ ومراعاة التنوع فيها ليتمكن التلميذ من الاستفادة منها أثناء الدرس داخل غرفة التربية الفنية وخارجها.

Library

الإسعافات الأولية

حقيبة الإسعافات الأولية هي عبارة عن مجموعة من الأدوات والأدوية التي يمكن الاستفادة منها في حالة الإصابة المفاجئة.

وتواجدها ضروري جدا في غرف التربية الفنية لأن التلاميذ يستعملون بعض الأدوات الحادة والمواد المختلفة لعمل بعض الأعمال الفنية.

لذلك يجب على المعلم والتلاميذ معرفة مكان تخزينها وكيفية استعمالها ويجب وضعها في مكان مناسب وسهل الوصول إليه.

وأيضا من الأشياء المهمة تفقد محتوياتها باستمرار وإضافة الأدوات الناقصة وكذلك التأكد من تاريخ صلاحيتها.

First Aid Kit

فهرس

Table of Content

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Appendix 2: Observation list

General information

School name:	Date:
Lesson time:	Lesson duration:
Level :	Class:
Subject name:	Number of students:

Details of Art Classroom

No	Elements	Comments
1	Location of art classroom • *Location of the class* • *Students can access the room easy* • *signs for new students and visitors to follow*	
2	Size of the room • *Size and shape of the room is suitable for the type of teaching , learning, and student number*	
3	Ventilation and Temperature • *Type and effectiveness* • *Windows* • *Door*	
4	Lighting • *Day and artificial light* • *Type of the light* • *Do lighting allows students to see all relevant materials for any tasks*	
5	Sound • *sources*	
6	Design of art classroom	
7	Floor *covering*	
8	Furniture • *Types* • *Size and it is suitable of student age*	
9	Classroom layout • *Seating is arranged so that all students can*	

	view and access all necessary material of the learning environment as well as can students see, hear, and join in class activities with teacher	
10	Classroom decoration • *The visual environment is appropriately Stimulating for attention and learning.*	
11	Colour(s) • *Walls* • *Furniture's*	
12	Contents (*sink, library, first aid, lockers*)	
13	Tools and materials	
14	Technology (*PCs, projectors, smart board*)	
15	Art classroom in general • *Workspace allows each student to access and use all needed materials and tools.* • *All students can enter, exit and move about the room freely* • *In an emergency situation, students can exit safely*	
16	Other	

Students' interaction with environment

……………………………………................

……………………………………….......

Students' interaction with each other

....

………………………………………………

Teacher's interaction with environment students

……………………………………................

……………………………………….......

Teacher's interaction with

....

…………………………………………

267

Appendix 3: Teachers' interviews

Personal interviews were conducted with teachers at different sites within schools, such as the library, the art classroom and normal classrooms, when students were not present. The topics addressed during the interview included the following.

Number of classes per week	Teaching class level			Experience (years)	Type of education	School code
	1	2	3			

No	Questions	Answers
1	What do risk-taking, creative thinking, and critical thinking mean?	
2	How do you encourage students to take risks and try new things in art lessons?	
3	What is the main factor in the art classroom environment that may inhibit students from taking risks and trying new things?	
4	What are the main aspects of the art classroom environment that may encourage students to take risks and try new things in their work?	
5	Do you think that the art curriculum encourages students' creativity and motivates them to try new things?	
6	What are the most important facilities that you need in your art classroom to encourage students to take more risks and to try new things?	
7	Are there any other issues or problems with your classroom, or any information that you would like to give?	

Appendix 4: Students' interviews

The interviews were conducted with students in different rooms in the schools, such as libraries, normal classrooms and art classrooms. The interview protocol included the following topics.

Date	Students level	School name
	( ) years	G/P

No	Questions	Answers
1	Describe your art classroom generally	
2	What is creativity thinking?	
3	What is critical thinking?	
4	What is risk-taking?	
5	What is the best thing you do in the art classroom?	
6	What is the main thing in the art classroom environment that inhibits you from taking risks and trying new things?	
7	What are the main aspects of the art classroom environment that encourage you to take risks and try new things?	
8	What are the most important facilities that you need in your art classroom to encourage you to take risks and try new things?	
9	Are there any other issues or problems with your classroom, or any information that you would like to give?	

<u>Questionnaire</u>

```
┌─────────────┐
│┌───────────┐│
│└───────────┘│
└─────────────┘
```

This questionnaire is designed to give you the opportunity to express your views and opinions about your art classroom environment.

This is a confidential questionnaire for the purpose of a research project (**Northumbria University, UK**).

School name ………………… Level……………..

---

1. ☐ I am interested in Art   ☐ I am not interested in Art

Please read the statements and tick the box which most closely corresponds to your opinion in each case.

	Statement	strongly agree	agree	neither agree nor disagree	disagree	strongly disagree
2	I prefer to take art sessions in our art classroom.					
3	The ventilation in our art classroom creates a good environment for creativity and trying new things.					
4	The temperature in our art classroom has a negative effect on my creative ability.					
5	The lighting in the art classroom is helpful in doing art tasks.					
6	During art sessions, student noise has a negative effect on my creative ability.					
7	The location of our art classroom is suitable and has a positive effect on my creative ability during art sessions.					
8	The design of our art classroom helps me to try new things in art tasks.					
9	The furniture in our art classroom is suitable and comfortable. It increases my ability to try new things in art tasks.					
10	The layout of our art classroom helps me to try new things in art tasks					
11	The work display in our classroom inspires me to be more creative.					
12	The colour(s) of our art classroom walls helps me to concentrate and makes me more comfortable.					
13	The sink helps me to try new things in my art tasks, by allowing me to wash my hands and tools.					

	Statement	strongly agree	agree	neither agree nor disagree	disagree	strongly disagree
14	Generally, I find the art classroom supportive of trying new things in art tasks.					
15	The art curriculum helps me to try new things in art tasks.					
16	The provision of tools and materials helps me to try new things in art tasks.					
17	Marks encouraging me to try new things in art tasks.					
18	Positive teacher behaviour encourages me to try new things in art tasks.					
19	The use of technology encourages me to try new things in art tasks.					
20	The use of library books in our art classroom encourages me to try new things.					
21	Cooperation with other students is one of the most important factors in encouraging me to try new things.					

22. What are the most important facilities that you need in your art classroom to help you try new things and to be more creative?

……………………………………...

……………………………………...

……………………………………...

……………………………………...

……………………………………...

……………………………………...

Thank you for participating in this questionnaire

Appendix 6: A sample of teachers' interviewer response in Arabic language

مقابلة معلمات التربية الفنية

رمز المدرسة	نوع التعليم	سنوات الخبرة	المرحلة الدراسية	عدد الحصص أسبوعين
٢٦٥	٢٤	١٢	3 ②1	١٥

الإجابة	السؤال	م
(handwritten response)	مامعنى المجازفة , الإبداع, التفكير النقدي	1
(handwritten response)	كيف تشجعين الطالبات على المجازفة واستخدام اشياء جديدة	2
(handwritten response)	ما اهم عامل في غرفة التربية الفنية الذي يحد من مجازفة الطالبات و استخدام أشياء جديدة	3
(handwritten response)	ما اهم عامل في غرفة التربية الفنية الذي يشجع الطالبات على مجازفة و استخدام أشياء جديدة	4
(handwritten response)	هل تعتقدين إن مناهج التربية الفنية تشجع الطالبات على الإبداع وتحثهم على استخدام جديدة	5
(handwritten response)	ما هي أهم وسائل المساعدة أو التجهيزات التي تحتاجين إليها في غرفه التربية الفنية لكي يشجع الطالبات على المجازفة واستخدام أشياء جديدة	6
(handwritten response)	هل لديك أي مشكلة في غرفة التربية الفنية أو هناك أي معلومات تريدين إضافتها	7

Appendix 7: A sample of students' interviewer response in Arabic language

مقابلة الطالبات

اسم المدرسة	الصف الدراسي	التاريخ
ح/خ	سنه (خامس)	٢ / ٧ / ١٤٢٨

الاجابة	السؤال	م
ا روحاكا .	أوصفي غرفة التربية الفنية	1
عمل اشياء جديدة وضعا .	ماتعريف التفكير الابداعي	2
عندي طهرف دايما دصرار .	ما تعريف التفكير النقدي	3
الحاوله وعمل شي جديد .	ماتعريف المجازفة	4
الحوارات والستشارة مع المعلمة . جمعى اوجهون لموضوع .	ما افضل شي تعملينه في غرفة التربية الفنية	5
الازدحام / حتى تؤثر الطالبات .	ما اهم عامل في غرفة التربية الفنية يحد من مجازفتك واستخدام أشياء جديدة	6
النفسي / شاكره لمعلم .	ما اهم عامل في غرفة التربية الفنية يشجعك على مجازفة واستخدام أشياء جديدة	7
كمبيوتر .	ما هي أهم وسائل المساعدة أو التجهيزات التي تحتاجين إليها في غرفه التربية الفنية كي يشجعك على المجازفة واستخدام أشياء جديد	8
ان تكون ساده لمعني اختيار نقش كن طالبه من اختيار عامه ان تكون بشكل تفصيل / فني / تبيد .	هل لديك أي مشكلة في غرفة التربية الفنية أو هناك أي معلومات تريدين إضافتها	9

15

استبيان

عزيزتي الطالبة: لقد صمم هذا الاستبيان لإعطائك المجال للتعبير عن مرئياتك و آرائك بخصوص غرفة التربية الفنية بمدرستك.

المدرسة......٦٥.................................. المرحلة.........٣............................

الاهتمام بالتربية الفنية :

يوجد لدي اهتمام بالتربية الفنية ☐ ب- لا يوجد لدي اهتمام بالتربيـــة ☑
الفنية

أقرئي العبارات التالية والمطلوب منك إبداء رأيك فيها بوضع علامة (√) أمام الإجابة المناسبة.

أبداً	نادراً	أحياناً	غالباً	دائماً	العبــــــــــــــــــــارة	م
				√	أنا أفضل أداء درس الفني بغرفة التربية الفنية	1
				√	التهوية في غرفة التربية الفنية بمدرستي جيده فهي تهيئ الجو المناسب للرسم والإبداع و ابتكار أشياء فنية جديدة	2
		√			درجة حرارة غرفة التربية الفنية بمدرستي مناسبة و تؤثر على قدرتي على الإبداع و الابتكار	3
				√	الإضاءة في غرفة التربية الفنية بمدرستي ملائمة و تساعدني على أداء الموضوع المطلوب في الرسم بكل دقة وإتقان	4
				√	أصوات الطالبات في غرفة التربية الفنية بمدرستي تؤثر على قدرتي على الابتكار و الإبداع تأثير سلبي	5
				√	مكان غرفة التربية الفنية بمدرستي مناسب يساعدني على الإحساس بالأمان وابتكار أشياء جديدة	6
				√	تنظيم غرفة التربية الفنية بمدرستي يساعدني على ابتكار أشياء جديدة في الموضوع المطلوب	7
√					أثاث غرفة التربية الفنية بمدرستي مناسب و مريح مما يساعدني على ابتكار أشياء جديدة	8
√					توزيع الأثاث في غرفة التربية الفنية بمدرستي يحفزني على ابتكار أشياء جديدة في العمل المطلوب من خلال المرونة بالمكان وسهولة الحركة	9
√					ديكور وطريقة عرض الأعمال في غرفة التربية الفنية بمدرستي يحفزني على الإبداع وابتكار الأشياء الجديدة	10

م	العبـــــــــــارة	دائماً	غالباً	أحياناً	نادراً	أبداً
11	ألوان الحائط في غرفة التربية الفنية مريحة و تساعدني على التركيز وتحفز قدرتي على الإبداع				✓	
12	حوض الغسيل يساعدني على الإبداع والابتكار من خلال تجربة العديد من الخطوات بعد تنظيف يدي وأدواتي باستمرار	✓				
13	بشكل عام غرفة التربية الفنية تساعدني على ابتكار الأشياء الجديدة والإبداع			✓		
14	منهج التربية الفنية ينمي لدي القدرة على التذوق الفني و يساعدني على ابتكار أشياء جديدة في الموضوع المطلوب				✓	
15	توفر الخامات وتنوعها يساعدني على ابتكار أشياء جديدة ومتنوعة	✓				
16	الدرجات مهمة جدا وهي تحفزني على الإبداع وابتكار أشياء جديدة	✓				
17	أسلوب المعلمة يساعدني على الإبداع وابتكار الأشياء الجديدة	✓				
18	استخدام الوسائل الحديثة مهمة جدا في تحفيز قدرتي على الإبداع والابتكار	✓				
19	المكتبة في غرفة التربية الفنية بمدرستي محتويه على كتب جيده وانا استخدمها باستمرار				✓	
20	التعاون مع زميلاتي مهم جدا بالنسبة لي وهو يساعدني على ابتكار أشياء جديدة في الموضوع المطلوب	✓				

ما أهم المتطلبات التي يجب توفرها في غرفة التربية الفنية لكي تساعدك على الإبداع وابتكار أشياء جديدة
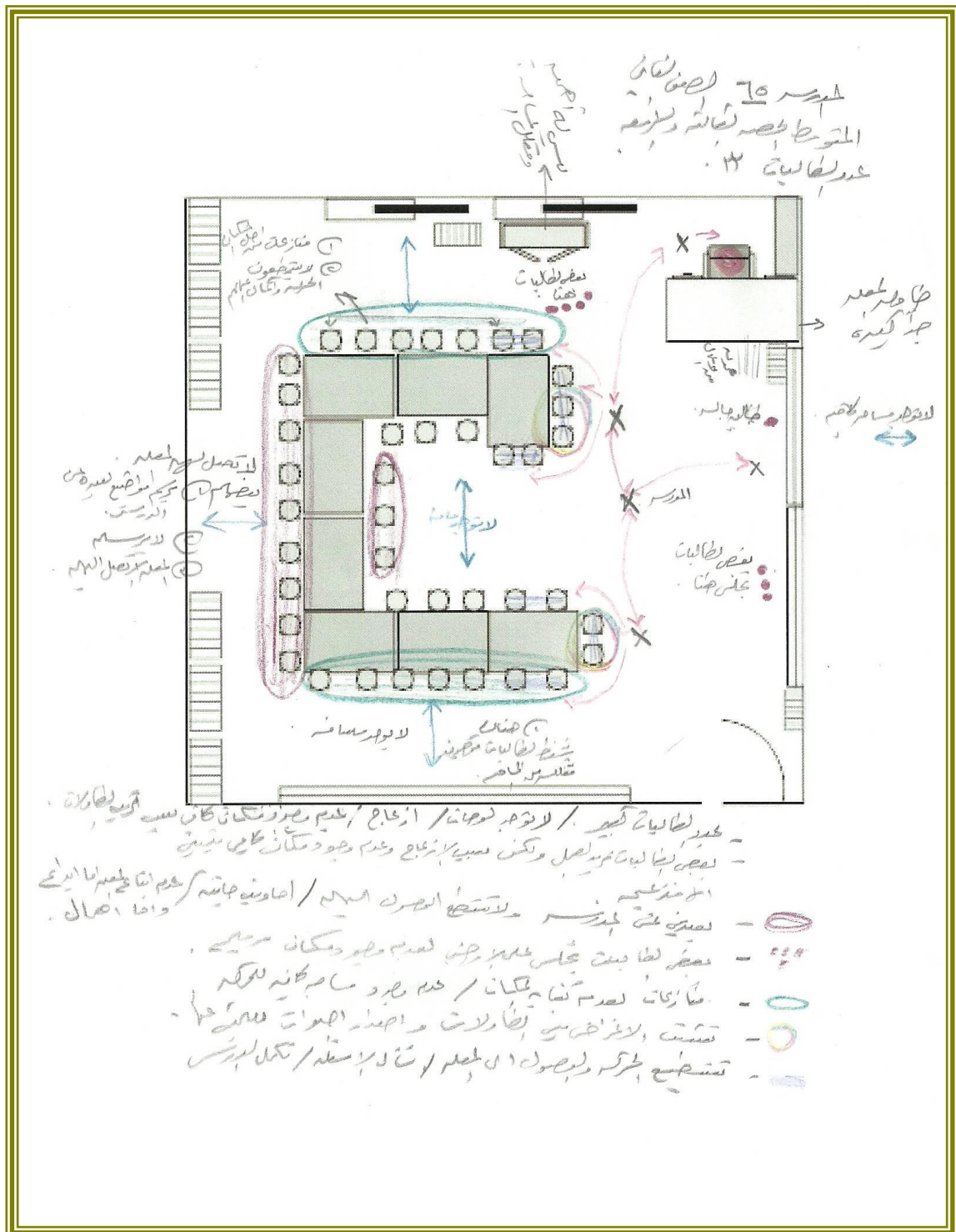
١- الراحه النفسيه

٢) الهدوء

٣) وجود إرعاب من اكماله وليس إحباط

لكم جزيل الشكر على تعاونكم

٤) النظافه

٥) ووجه ديكور مناسب

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