# THE METHODOLOGY OF DEVELOPING THE INTERIOR ENVIRONMENT OF KINDERGARTENS

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# ABSTRACT

The idea of this research is based on the Palestinian Ministry of Education and Higher Education (MOHE) and the United Nations Educational, Scientific and Cultural Organization (UNESCO) declaration, which points to the Palestinians' need to generate their own kindergarten (KG) building regulations. This study aims to support this need by establishing a base that MOHE can rely on when building their own regulations. This study will not give them direct solutions, but will build a strong foundation that can be used as a starting point. This foundation will be built through understanding the next five points, which are:

1. the Palestinian (PS) background, which includes their history, culture, environment and education system
2. the education system in Palestine and the main role that KGs play in the Palestinian society
3. KG users' needs, difficulties and problems in Palestine, such as those that occurred as a result of Israeli Military Occupation and the poor economic situation
4. Palestinian building patterns, materials, structure, history and the quality of space in their learning environment, which are covered in the Palestinian case studies
5. the KG buildings' needs and problems in Palestine, by studying and examining the quality of space and the relationship between the KG structure and its users in Palestine.

It is believed that by understanding the previous points, the main problems of PS KGs can be highlighted, to be addressed later by specialists. The second phase of this research studies three international case studies in addition to the British case. The aim of studying these successful KG designs is not to copy them but to learn from them and use them as a mirror to compare them with keeping a distance from them. The international studies hold general concepts that could be considered international criteria, from which the future PS KG building regulations can learn and take advantage, after re-moulding them in the PS culture and characteristics. It is believed that regardless of the disadvantages and difficulties of the current Palestinian buildings, which were converted to KG facilities, the buildings carry unique principles and characteristics that can enhance and enrich the Palestinian learning environment.

The third phase makes a comparison between: the Palestinian unique principles that come through studying the Palestinian traditional buildings, environment etc.; the international principles that come though studying three successful international KG projects; and the missing principles in the current PS KG buildings that come out of highlighting the main problems which are related to the quality of learning spaces. As a result of this comparison it will be determined what should be kept or excluded from the previous three drivers, which will move the research to the fourth phase.

In the fourth phase, the outcomes of the previous comparison 'drafts' are discussed with MOHE to outline the main difficulties they may face in applying them. The possibility of supervision by MOHE is discussed, which will make a review for the entire 'draft recommendations'. This will enable the study to generate the best final recommendations that can meet the Palestinians' needs and aspirations. These final recommendations will be considered as the base that MOHE can rely on in forming their own regulations in the future.

- **Keywords:**

Palestine, kindergartens, Palestinian kindergartens, interior design, the quality of space, early learning environment, the quality of learning environment, the development of the interior environment of kindergarten, kindergarten building regulations, and licensing kindergarten buildings

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**Ehab Mohammed Naji Abu-Hannoud**

# Contents

# ABBREVIATIONS

| | |
|---|---|
| **AIHDKGh** | The Average of Indoor Humidity During Kindergarten Hours |
| **AITDKGh** | The Average of Indoor Temperature During Kindergarten Hours |
| **B'Tselem** | Israeli Information Center for Human Rights in the Occupied Territories |
| **CCOHS** | Canadian Centre for Occupational Health and Safety |
| **CFM** | Cubic Feet per Minute |
| **$CO_2$** | Carbon Dioxide |
| **CPT** | Christian Peacemaker Teams |
| **EYFS** | Early Years Foundation Stage |
| **GUVS** | General Union of Voluntary Societies – Jordan |
| **ICBS** | Israel Central Bureau of Statistics |
| **IDF** | Israel Defense Forces |
| **JK** | Junior Kindergarten |
| **JP** | Japan |
| **KG** | Kindergarten |
| **KGh** | Kindergarten Hours |
| **LPG** | Liquid Propane Gas |
| **Lux** | The International System unit of illumination, equal to one lumen per square metre |
| **ME** | Middle East |
| **MOHE** | Palestinian Ministry of Education and Higher Education |
| **MOSA** | Ministry of Social Affairs |
| **NGO** | Non-Governmental Organisations |

ABBREVIATIONS

| | |
|---|---|
| **NNU** | An-Najah National University |
| **OC** | The degree Celsius |
| **Ofsted** | The Office for Standards in Education, Children's Services and Skills |
| **PA** | Palestinian Authority |
| **PCBS** | Palestinian Central Bureau of Statistics |
| **PLC** | Palestinian Legislative Council |
| **PLO** | Palestine Liberation Organization |
| **PMRS** | Palestinian Medical Relief Society |
| **PPM** | Parts Per Million (a unit of measurement for carbon dioxide level in air) |
| **PRCS** | Palestine Red Crescent Society |
| **PS** | Palestinian Territories |
| **RH** | Relative Humidity |
| **SK** | Senior Kindergarten |
| **Temp.** | Temperature |
| **UK** | United Kingdom |
| **UN/UNO** | United Nations Organization |
| **UNESCO** | United Nations Educational, Scientific and Cultural Organization |
| **UNPD** | United Nations Development Program |
| **UNRWA** | United Nations Relief and Works Agency for Palestine Refugees in the Near East |
| **US** | United States (of America) |
| **WCU** | Wheelchair user |
| **WHO** | World Health Organization |

# Chapter 1 : INTRODUCTION

According to UNESCO assessment report (Mahshi, 2000), published in cooperation with the Palestinian Authority (PA), the Ministry of Education in Palestinian territories is facing a number of challenges in its endeavour to expand its role of developing kindergartens (KGs). These challenges mainly concern the following:

a) Funding
b) Lack of appropriate policies, laws, protocols and lists.

Despite these problems, MOHE has declared its intention of trying to remove the obstacles that hinder the development of KGs, through reliance on its own efforts in cooperation with other interested parties in the early education field.

MOHE believes that the current KG status could be improved by: drafting policies; issuing the necessary laws; and coordinating actives between the ministries, the private institutions operating in the field of early childhood and the donors themselves, and between these donors and the concerned parties or those operating in the field of early education. It could also be improved by attracting experts and competent staff to work in KGs. The Ministry is also encouraging families' participation in these efforts, and hastening the move from the trial stage to implementation (MOHE 2011).

However, despite all this, UNESCO (Mahshi, 2000) feels that it is improbable that a quick improvement of pre-scholar education will be reached, for the following reasons.

a) Failure to consecrate time, expertise and available resources to develop a policy, a structure, and plans of action in the concerned institutions for the time being.
b) Lack of time, expertise and available resources; these are currently being used to solve daily problems.
c) Constraints imposed by donors on expenditure on the development of capacities related to pre-scholar education and solving its problems, and the lack of other financial resources.

d) Weakness of cooperation and coordination between the various ministries and concerned institutions.
e) Weakness of parents' participation.
f) Weakness of the social awareness of the need to contribute in the cost of services provided.

They believe that MOHE should still work on finding proper solutions for the aforementioned problems. Until then, MOHE should keep supervising the KGs indirectly, monitor the operating KGs and the quality of programmes, and issue the related licences.

The report shows the awareness of MOHE of the importance of developing the early-education sector, and in order to achieve this aim they started to plan for teacher training programmes, with the help of non-governmental organizations (NGOs). However, a lot of MOHE projects were frozen or stopped completely as a result of the second Intifada in September 2000 (Pages 30 and 114), which led to a change in the priority list of the Ministry, in order to prevent the rapid collapse of the whole education sector in the Palestinian territories. The sudden change of the Ministry plans occurred as a result of the unpredictable aggression of the military occupation and its impact on all Palestinian facilities and its infrastructure, which includes the education sector. The change of plans did not take into account that the conflict (Intifada) would continue for a long time, which explains the deadlock of this development until the vision becomes clearer.

This is why the Palestinian Minister of Planning could not set up a clear plan for the current Palestinian development plan that includes education: because these plans face high risks of failure in reaching all their declared aims, such as happened with previous plans.

Therefore, after nine years of outbreak of Intifada it seems that the MOHE 'vision' is still not entirely clear. This belief was based on the recent visit to the MOHE office in Nablus City in 2009, which has been done by the researcher. This visit was part of a pilot study to the West Bank in Summer 2009, which aimed to take a closer look at the Palestinian KG problems and the current situation of these facilities, and meet some teachers and educators[1]. In addition, this visit aimed to collect information about the current licensing requirements for KG structures. However, other facts were discovered as a result of meeting the managing director of MOHE, who was responsible for granting licences to KGs in the city and the whole province, in Nablus City in July 2009. First, according to both the managing director and the engineering section at the Ministry of Education, “***until this moment, there are no terms and conditions, which are written by the law, to describe and determine the basic requirements for licensing kindergartens’ structure***”. In addition, when they were asked about the methodology which has been followed in the granting of licences to some buildings whilst withholding them from others, the Engineering Department in the Ministry mentioned some facts that point again to the existence of a significant problem (Pages 139-143).

In brief, what could be concluded from this meeting (MOHE 2009) is as follows:

a) There are no written laws that rule the relationship between the Engineering office and KG owners.
b) An architect’s “self-estimated experience in this field and conscience” are the criteria for licensing (or rejecting) KG structures in the Ministry. This could put the health and safety of children and also the whole educational process in KGs under mercy of these criteria. This situation can easily lead to inconsistency; a KG that is considered unqualified to obtain a licence by one architect of the Ministry could be fully licensed or partly licensed (with some modifications) by another architect from the same office.
c) Powers are given to Inspectors of Education for flexibility based on their personal conviction; one inspector's recommendation is enough to grant a licence (without legal controls that must govern the issue), and the absence of laws binding on all the aforementioned could encourage both financial and administrative corruption.

The lack of laws may not only lead to licensing of KGs that do not serve either children’s needs or the educational aims, but also authorise KGs that may cause a direct danger to the

[1] Meetings with MOHE members and teachers were reheld in 2012

safety and health of the children. Moreover, the lack of written laws that can be used as a reference to rule the relationship between all parts can directly/indirectly encourage corruption. There is no doubt that the administrative or financial corruption within the PA could easily lead to granting undeserved licences to KG owners who have money to pay, or those who have power because of their relationship with the government or the local councils.

The Ministry of Education faces many problems that prevent the development of KGs in the Palestinian territories. This study focuses on one of these problems – the lack of the Ministry of Education instructions/laws for licensing the KG facilities in the Palestinian Territories – and discusses the best solutions to help MOHE to eliminate this obstacle. Therefore, in brief, the MOHE problem, which is related to developing the interior environment of KG buildings, will be considered the study problem in this research.

## 1.1. THE RESEARCH QUESTIONS

This research aims at answering the following questions:

a) At present, after about 10 years of highlighting the MOHE problem that pointed to the lack of laws in the early educational sector in terms of licensing KG facilities in PS, is there any formed written law that could establish the relationship between two of the main players: the KG landlords and MOHE? If any, are they being applied efficiently and effectively?

b) If they are applied, can they achieve the KG aim to build a safe and healthy learning environment, and also satisfy the PS child's needs at the psychologically and physically level? If not, what would the gap be that the current terms and conditions may miss?

c) What might the absent principles be that MOHE still need to generate their own KG building regulations, which are necessary to fill this gap, if any?

d) What are the strengths and weaknesses that characterize the PS KGs from the rest of KGs around the world, which can be utilized later in the development process?

e) What are the internal and external factors/difficulties that distinguish Palestinian children and KGs in PS and what is their possible impact on the current and the future licensing KG facilities in PS?

f) How can the new suggested licence contribute to addressing these difficulties or mitigate their impact on this sector?

The main question is: based on the problems and opportunities extracted from the series of former sub-questions, what are the main principles (international/local) and necessary criteria that are needed to build up a strong foundation that MOHE can rely on later in generating their own KG building regulations in PS?

## 1.2. THE STUDY HYPOTHESIS, AIMS AND OBJECTS

### 1.2.1. Hypothesis

A) The study assumes that developing a KG learning environment serves the early childhood in PS.

B) It is assumed that both developing the interior environment of KGs in PS and the KG building regulations, which work on insuring the minimum quality of the interior spaces in these facilities, are the first step towards improving the learning environment of KGs.

C) This study assumes that it can contribute to the Ministry of Education’s effort so far towards improving the PS KGs by providing the scientific bases that MOHE is looking for in this field.

D) It is assumed that highlighting the key players’ needs, difficulties and problems in this sector is the first step towards building the scientific methodology to develop the KG learning environment in PS.

E) It is assumed that the Ministry can use this research as a base to begin establishing its own written law to rule the relationship between the Ministry and KGs, which will enhance the whole education process in the pre-school sector.

F) It is assumed the international case studies hold general concepts that could be considered international criteria, from which the future Palestinian KG building regulations can learn and take advantage.

G) It is assumed that, regardless of the possible disadvantages and difficulties of the current PS KG buildings, these buildings carry unique principles and characteristics that can enhance and enrich the PS learning environment.

### 1.2.2. Aims

A) This study aims to create a learning environment capable of serving children in their early education facilities (KGs) in PS.

B) It aims to enhance the quality of the interior learning environment of KG buildings in PS.

C) This study aims to be considered as the scientific support that the MOHE is looking for from educational institutions and people who are interested in the early education sector (Mahshi, 2000).

D) This study aims to identify the key players' needs, problems and difficulties in the early education sector.

E) This study aims to support the MOHE plan to generate its own KG building regulations, by establishing a base that MOHE can rely on when building its own regulations. Although this study will not give it direct solutions, it aims to build a strong foundation that MOHE can use as a starting point in its way towards writing a guideline for licensing PS KG facilities.

F) This study aims to take advantage of some successful international KG project designs by learning from them their key success.

G) This study aims to highlight the unique principles and characteristics that the current PS KG buildings could have, as it is assumed they can play a vital role in enhancing and enriching the PS learning environment.

### 1.2.3. Objectives

A) Developing a scientific methodology, which can be relied upon for the development of the KG learning environment in KG PS buildings to serve the early childhood in PS.

B) Constructing and developing a new design and monitoring guidelines for PS KG buildings, which insure achieving the minimum standard quality of the learning environment for PS society.

C) Interviews with MOHE's members (decision makers) to identify the main problems and difficulties in this sector in PS.

D) Collecting data about the current situation of KG buildings in PS to outline their needs, problems and difficulties.

E) Measuring the quality of space (the rate of $CO_2$, %RH and temperature) in a sample of PS KG buildings. In addition to studying the relationship between the inside and outside of their learning environment.

F) Revise the experience of the most developed countries in this field to take advantage of them; it is believed successful international projects could be valuable resources that can provide a strong starting point for the MOHE in its effort to establish national standards for KG facilities.

## 1.3. CONTRIBUTION TO KNOWLEDGE

This study is all about methodology, the methodology of developing the interior environment of KG facilities by establishing a KG building regulation system to achieve at least the minimum quality of learning environment, which is capable of supporting childhood in a specific country. Applying this methodology is not limited to PS, which has been used here as an example only, but it can also be applied and followed in any country that is looking forward to developing their own early education sector.

Therefore, any country that may have a similar situation, such as Iraq and Syria, can take benefit from this study by following the same strategies that are built mainly on KG player's needs, problems and difficulties in a specific region.

## 1.4. PROPOSED METHODS AND PROGRAMME

| | | |
|---|---|---|
| 1. Literature review<br>2. Case studies<br>3. Field work<br>a) Pilot study<br>b) Interviews<br>c) Note taking | Morphological study (pattern) | Recommendations and conclusions |

**Figure 1: The proposed methods and programme**

## 1.5. THE RESEACH STRUCTURE

### 1.5.1. Boundaries of the study area

The boundaries of the study area are determined as follows:

A) Geographical boundaries: the geographical boundaries of this study will include only the territory of the West Bank in PS, and will exclude the Gaza Strip.

B) Targeted group: the study focuses on Palestinian children aged between 3.8 and 6 years old; both genders.

C) Targeted grade: this study will include only the KG stages (KG1 and KG2[2]), and will not include nursery schools or day-care centres (children attend KG1 and KG2 as a non-compulsory stage of education in PS).

### 1.5.2. The key players

The study identified the key players as follows:

1. MOHE, which will represent the local government
2. The KG landlords/directors, who will represent KGs
3. Parents, who will represent their children.

[2] KG1 and KG2 are two years of pre-school (one-year for each phase), pre-enrolment for the elementary school.

## 1.6. THE RESEARCH METHODOLOGY

This study is all about the methodology of building a scientific foundation to develop the interior environment of KG buildings in PS. This foundation will be built based on the following points (Figure 2). Firstly, understanding the PS background, which includes its history, environment, culture, social structure, educational system, economic situation, and its traditional buildings. This will be a vital issue not only in understanding its past and elements that could hamper the development of an early education sector but also in understanding the impact of the PS background on the present situation of its KG buildings and the future development of its KG learning environment. For instance, the poor economic situation for PS people may put limits on how to develop this sector in the future, the methods used to achieve this aim, and the time required to implement it.

Secondly, highlighting and analysing the PS KG user's needs, problems and difficulties in order to draw the best policies and regulations that work on addressing these issues or at least work on minimising their negative impacts on this important sector. In addition, this will be essential not only to understand the dimensions of the current problems but also their roots, which mainly affect the progress of this sector and hinder MOHE when drawing proper strategies to enhance the learning environment of PS KG specifically. The key success of any new developmental process should come through focusing on customers' needs.[3]

Thirdly, interviews with MOHE to review the impact of the current external and internal difficulties, which face all KG users today. The main aims of holding these meetings are:

1. to identify and present the causes and ways that have been followed by the Ministry to address the previous difficulties;
2. to have a close look at the MOHE's future plans to develop this sector;
3. to identify the mechanism used in the licensing of KG buildings in PS;

[3] Key players: MOHE, KGs and children.

4. to work on outlining the proper gaps that current KG building regulations or monitoring system may have to study their impact on this sector and also to be addressed later.

This will not only provide the study with official and dependable resources but also will provide it with professional and expert resources, by those who are interested and so close to this practical field in PS. It should be pointed out that the first and final drafts and study recommendations will be revised with MOHE for modification later.

Fourthly, this study will take three PS case studies from the current KG buildings. The quality of their spaces and the relationship between them will be examined and analysed to identify their strengths and weaknesses. Outlining weakness points will be a vital issue to work on filling the gaps in the future work/development plans, while keeping all strength points. The quality of spaces will be examined on two levels: the physical level, which includes measuring the rate of $CO_2$, %RH, indoor air temperature and the amount of light inside the KG buildings; and the second level will be analysing the relationship between KG spaces themselves, such as analysing the relationship (links) between inside and outside spaces, studying the visual barriers and their impact, and the motion paths inside these KG buildings in PS. By having these local case studies, the missing principles and standards in the PS KG building regulation system will be identified to be addressed later in this study.

Fifthly, outlining the key successes of three international case studies. These successful KG designs hold general concepts (international criteria) from which the future MOHE's development plans can take advantage, after re-moulding them in the Palestinian culture and characteristics. Moreover, this phase will include the explanation of inspection methods to fulfil quality requirements by decision makers in the UK (England).

Finally, outlining, studying, analysing and then comparing the outcomes of the collected data from the previous four drivers, which are:

1. the current difficulties of KG users in PS that come through understanding the PS background;

2. the present and the future plans of MOHE to develop the KG learning environment in PS;
3. PS principles and missed standards;
4. the international principles and general criteria that come through studying the key success of the international KG projects.

These can lead the study to decide what should be kept or extruded from these outcomes, depending on their potential role in supporting and enhancing the PS KG learning environment in any future development plans. This will move the study to the next phase by drafting the first copy of the study recommendations, which will be revised with MOHE and discussed with all key players in order to review their perspectives on these presented proposals. The feedback of these revisions and discussions, which comes from sharing all parts, will be a vital issue to reach the final recommendations, which suit and benefit all parties concerned. The final recommendations will be followed by the study conclusion and the suggested future studies for developing this sector (Figure 2).

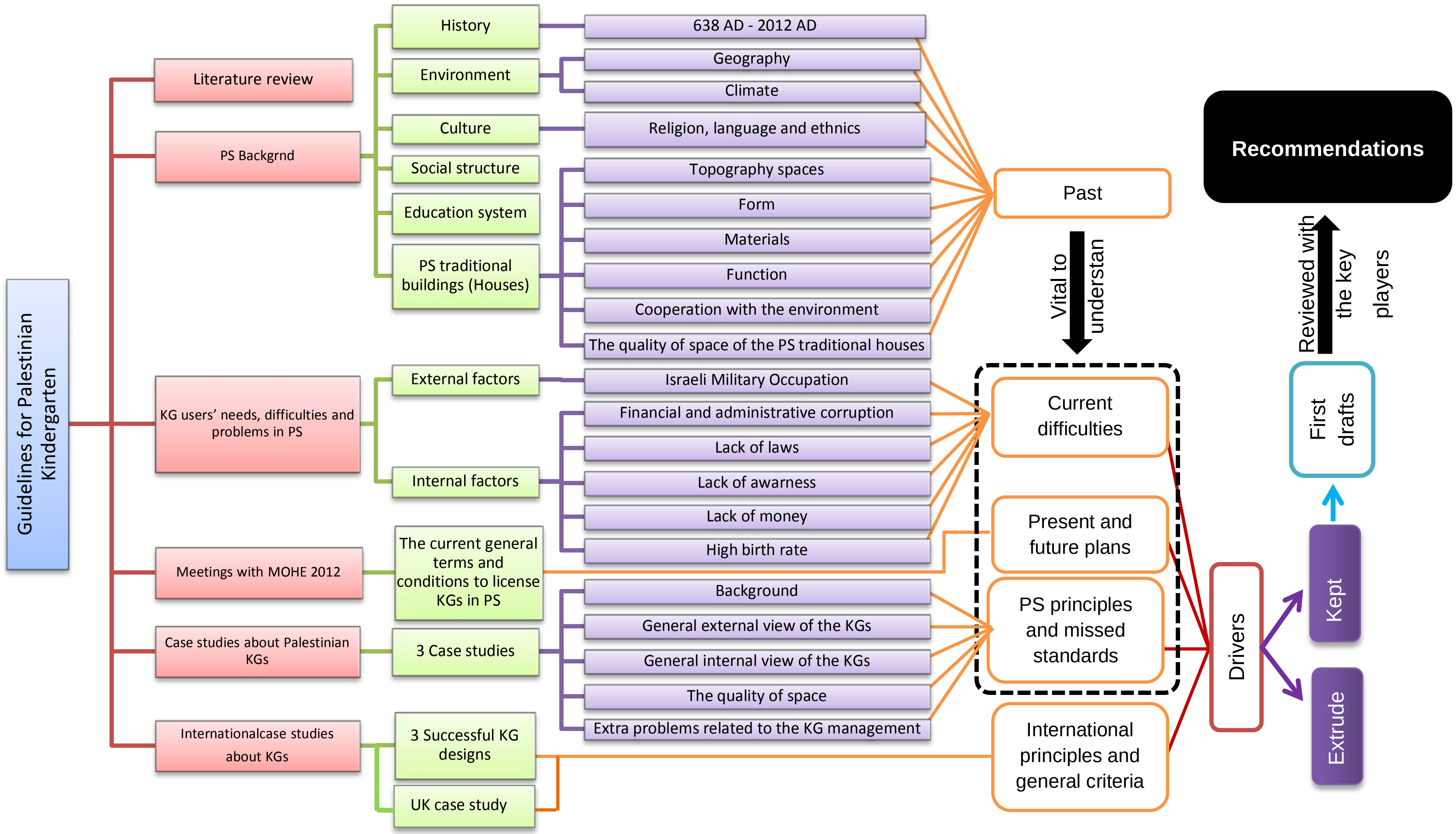



Figure 2: The methodology plan that will establish the system of the research, the above key factors will be reviewed

# Chapter 2 : LITERATURE REVIEW

## 2.1. PALESTINIAN BACKGROUND

The education field in the Palestinian territories has several factors that could have a negative or sometimes a positive impact on young children, who are considered the main target of this study. In this research, these factors have been divided into two groups: external and internal factors. This part of the study will outline these factors and clarify how each one of them could affect education in PS.

However, because the Palestinian territories have been under military occupation since 1967 (Roberts, 1988), there is no doubt that this has had a direct impact on many sectors, the education sector being one of them. Therefore, the first part of this research focuses on the impact of the Israeli military occupation on education; in addition, how the military occupation could have a negative impact on children's health and on the economy, which are also connected to education.

The military occupation and its negative impacts on all sectors that are related to education are considered in this study as an external factor, whereas the financial and administrative corruption of the PA, the lack of laws governing the granting of licences for the establishment of KGs and the lack of awareness, such as towards the importance of KGs, are considered here as internal factors.

In order to understand the current problems of the education sector and the difficulties that face pupils in PS, a brief background of the Israeli–Palestinian conflict should first be presented. This background will try to summarise the historical background of the conflict, which is necessary to build a clear picture of the circumstances surrounding this conflict and how it has affected successive events.

## 2.1.1 HISTORY

### 2.1.1.1. PS under the Ottoman rule

Islam was first introduced to the region of PS during the Muslim conquests of the 7th century (638 AD), when armies from the Arabian Peninsula under the Rashidun Caliphate conquered a territory previously under the control of the Byzantine Empire. The Ottoman Empire ruled PS for nearly four hundred years, from 1514 AD (Cody & Sprinchorn, 2007), when Sultan Selim captured Jerusalem and the surrounding area, until the British Mandate for PS in 1917. PS was a peaceful country during this period. Muslims, Jews, Greek Orthodox, Armenian Catholics, Assyrians, Coptics, Russian Orthodox, Protestants, Samaritans and Latins were living alongside each other in peace, and enjoyed the stability in 'the holy land' under the Ottoman rule, sometimes referred to as "the golden age". In the 19th century, the land of PS was inhabited by a multicultural population, consisting of approximately 86% Arab-Muslims, 10% Arab-Christians, and 4% Jewish, living in peace (Sayegh, 1984).

### Zionism and Palestine

In the late 1800s a Jewish political movement decided to colonise this land. Known as Zionists, they represented an extremist minority of the Jewish population. The Zionist movement became a formal organisation in 1897 with the first Zionist congress in Basle, organised by Theodor Herzl. Their goal was to create a Jewish homeland, and they considered locations in Africa and the Americas, before settling on PS (Schoerman, 1988) (Al-Kayyali, The History of Modern Palestine, 1990, pp. 26,29,33). At the beginning, this immigration did not face serious problems. Yet, the indigenous population become increasingly alarmed when more Zionists immigrated and expressed their wishes to take over Palestinian land for the establishment of their future Jewish state. This clearly led to the area exploding, and fighting broke out, with an increasing rate of violence (1920-1921, 1928-1929 and 1936-1939). It should be pointed out that two main factors led to the increase in the rate of Jewish immigration to PS and the growing conflict: the Nazis coming into power in Germany; and Zionist activities disrupting all efforts aiming to place Jewish refugees in western countries (Drummond, 2002).

### 2.1.1.2. PS under the British Mandate

The Zionist movement was supported and aided by the British Government (Al-Kayyali, The History of Modern Palestine, 1990). Before the British Mandate in 1917, an important statement outlined the public policy of the British Government towards PS. This declaration supported “the establishment in Palestine of a national home for the Jewish people” (Shlaim, Yet More Adventures with Britannia: Personalities, Politics and Culture in Britain, 2005). On 2 November, 1917, Arthur Balfour, Britain’s Secretary of State for Foreign Affairs, addressed a letter to Lord Rothschild, one of the leaders of the British Jews, as follows:

> “… His Majesty's government view with favour the establishment in Palestine of a national home for the Jewish people, and will use their best endeavours to facilitate the achievement of this object, it being clearly understood that nothing shall be done which may prejudice the civil and religious rights of existing non-Jewish communities in Palestine, or the rights and political status enjoyed by Jews in any other country."
>
> Arthur Balfour (Schneer, 2010)

> “The Balfour Declaration is a promise made by someone who does not own [something], to [grant it to] someone who does not deserve it. It has been believed that this promise came in order to obtain the support of World Jewry “
>
> (Peel, Rumbold, Hammond, Carter, Morris, & Coupland, 1937)

Therefore, the British Government in 1917 issued the Balfour Declaration; also, after taking the decision to put PS under the British Mandate, this statement was confirmed by the Churchill White Paper on 3 June 1922, which reiterated the right of the Jews to a Homeland in PS (Churchill, 1922). These statements and promises came with deliberate ignorance of the Palestinian people, who were referred to in the Balfour Declaration as “non-Jewish communities” (Schoerman, 1988). Those communities formed about 92% of the inhabited populations in PS in 1917.

The Arab rejection of these successive events was represented in mass demonstrations and revolutions (1920-1921, 1928-1929 and 1936-1939) against what was occurring in the land in front of their eyes. It should be pointed out that the Arab rejection was against the huge number of Jews immigrating and the Zionist project in PS. These demonstrations have never been against Judaism or the minority of Jews who were living in PS for many years (Saleh, The armed resistance against the Zionist project in Palestine 1920-2001, 2002) (Saleh, Palestine: A series of systematic studies on the Palestinian issue, 2002, p. 110). The violence escalated between the Arabs and the Jewish immigrant 'newcomers', beginning in 1921. The August 1929 riots resulted in the death of 133 Jews and 116 Arabs. There followed a revolution in 1936 (Al-Kayyali, The History of Modern Palestine, 1990, pp. 260-262). The local people saw in the increasing number of Jews moving to the region not only as a threat to their way of life but also as a serious threat to their existence, especially when Arab Palestinians had seen more and more of their farmland purchased or confiscated by Israeli settlers, in collaboration with the Government Mandate. They feared that the onslaught of Jewish refugees will change PS forever, and Arab Palestinians will be a minority in their own land (Drummond, 2002).

#### 2.1.1.3. PS under Israeli Occupation

The Israeli occupation of Palestinian territory is in its sixth decade and the undercurrent of violence and inherent abuses of fundamental human rights and disregard for international law inherent in any long-standing military occupation is presented by both sides. Civilians continue to bear the brunt of the violence in the region (Dugard, 2008) (Goldstone, 2009).

One of the main consequences of the Belfour Declaration is creating the core of the Israel-Palestine conflict, which based today on the question of land and who rules it. The collision of Jewish nationalist colonisation and Palestinian nationalism, both laying claim to the same territory, forms the basis of this long conflict, deepened by the tragedies of the Holocaust and of the dispossession and occupation of Palestine. The United Nations partition of the land in 1947, an effort to resolve the two claims simultaneously, did not result in a lasting settlement. This act ignited the next wars between the new settlers and indigenous people.

### A) UN Partition Plan and the 1948 Arab–Israeli War

Finally, in 1947, the United Nations (UN) decided to intervene. Yet, rather than stick to the principle of 'self-determination of peoples', which enables the people themselves to create their own state and to select the system of government, the UN, by resolution number 181 on 29 November 1947 (UN, 1947), decided to use its power to divide Palestine. Under considerable Zionist pressure, the UN recommended giving away 55% of PS to a Jewish state, although this group represented only about 30% of the total population, and owned less than 7% of the land (Saleh, Palestine: A series of systematic studies on the Palestinian issue, 2002, pp. 20, 39) (Al-Kayyali, The History of Modern Palestine, 1990, p. 367). For more information please see Appendices 1 and 2.

While it is widely reported that the resulting war eventually included five Arab armies, less well known is the fact that throughout this war Zionist forces amounted to more than all the Arab soldiers and Palestinian fighters combined, often by a factor of two to three. Furthermore, Arab armies did not invade Israel, because almost all battles were fought on land that was supposed to be the Palestinian state. After the 1948 war, 80% of the Palestinian people were dispossessed of their homes, farms, and businesses. About 750,000 Palestinians had been made refugees and over 500 towns and villages had been demolished (Appendices 1 and 2). Moreover, not only was a new map drawn up but also every city, river and hill received a new Hebrew name. In addition, all vestiges of the Palestinian culture were to be erased. For many decades the official Israeli policy denied the existence of this population; the previous Israeli Prime Minister Golda Meir said:

> "There is no such thing as a Palestinian people ... It is not as if we came and threw them out and took their country. They didn't exist."
>
> (Meir, 1969)

This statement explains the Zionist ideology and policies towards Palestinians, and the claim of "A land without a people for a people without a land". This myth was used by early Zionists to promote the story that PS was a far land, a desolated and uninhabited place ready for the taking. This claim was quickly followed by denial of Palestinian identity, nationhood or legitimate entitlement to the land in which the Palestinian people had lived throughout their recorded history (Schoerman, 1988).

**B) The Six-Day War (the 1967 war)**

In 1967, Israel occupied more land. As a result of the Six Day War, Israel occupied the final 22% of PS that had eluded it in 1948 (see Appendix 1), which included the West Bank and the Gaza Strip.

In addition, it occupied parts of Egypt (now returned) and Syria (which also remain under occupation). Since, according to international law, it is unacceptable to obtain territory by war, these are occupied territories and do not belong to Israel. Thus, the Security Council adopted Resolution 242 in November 1967, which calls for Israel to withdraw from territories occupied in June 1967 and the return of Palestinian refugees to their homes (Fawzy, 1983).

**C) The core of the continuing conflict**

There are two main points that operate on the continuation of this conflict. The first point is that Israel is still trying to retain racial supremacy of its ‘foreign citizens’ in a country whose indigenous people ‘Arab Muslims and Arab Christians’ constituted approximately 83.3% of the population (see Appendix 2). This has led to the creation of an unstable situation. Moreover, during the wars in 1948 and 1967, Israel aimed to dispose of the original inhabitants, which created refugee problems (see Appendix 2). Those refugees are prohibited from returning to their homes in what has come to be called Israel, which always describes itself as a Jewish State. In addition, those within Israel are faced with systematic discrimination (Schoerman, 1988).

The second point is a continuation of the military occupation of what is considered the Palestinian Territories, the confiscation of private properties such as homes and lands, the suppression of freedom, the economic blockade, and the continued arbitrary imprisonment of 8,472[4] young men, women and children under difficult circumstances on 30 June 2008[5].

According to the Ministry of Detainee and Ex-Detainee Affairs report (MOD, 2008), the number of Palestinians detained is over 40% of the total male Palestinian population in the Occupied Palestinian Territories. In addition, there is the closure of borders, and the daily humiliation at the military checkpoints that operate in all regions. It is also rare not to hear daily about a number of deaths and injuries among the Palestinian inhabitants in the West Bank or the Gaza Strip by the Israeli Defence Forces (IDF) (B'TSELEM, 2007).

### D) The First Intifada (December 1987–1993)

The First ‘Intifada’, which means in Arabic an uprising/shaking off, was a Palestinian uprising against the Israeli occupation and the military rule in the Palestinian Territories. The uprising began after the killing of four and injuring of seven Palestinian workers at an Israeli military checkpoint by an Israeli military truck. The Intifada started in refugee camps and quickly spread throughout Gaza, the West Bank and East Jerusalem (Saleh, The Palestinian issue: backgrounds and developments until 2001, 2002) (Hamad, 2007).

It is believed that the outbreak of the first Intifada in 1987 was not accidental; it was the result of 20 years’ of occupation, emergency laws, settlement schemes, attempts to destroy houses[6], and the unjust arrest of thousands of citizens. The imposition of collective punishment and control of the facilities of life, the closure of scientific institutions, land confiscation, the economic war, and the denial of the Palestinian people to a national identity were also contributing factors (Roberts, 1988).

---

[4] According to the Israel Prison Service report on 31 July 2008 (MoDEDA, 2008)

[5] Since the beginning of the second Intifada, from September 2000 all the way through April 2003, more than 28,000 Palestinians have been incarcerated in prisons (FIDH, 2004). In addition, according to The Ministry of Detain and Ex-Detainees Affairs in The PNA (MoDEDA) and PCBS (PCBS, 2011) between 750,000 and 850,000 Palestinians have been arrested for political reasons in Israel since 1967, which is approximately more than 25% of the Palestinian population (Qaraqe, 2011).

[6] Since the end of the War of 1967, IDF has demolished approximately 25,500 Palestinian structures in the occupied Palestinian territory (Khalaf, 2012).

Palestinian reactions ranged from peaceful marches to disobedience and violence. In addition to general strikes that swept through the country, boycotts on Israeli products, graffiti and barricades, Palestinian demonstrations included stone-throwing by youths. Those youths, who are known as the 'children of the stones' against the heavily-armed IDF, brought the Intifada international attention. Over the course of the first Intifada, an estimated 1,376 Palestinians were killed by IDF and 94 Israelis were killed by Palestinians (B'Tselem, 2010).

### E) The Oslo Accords (Sept 1993)

The Oslo Accords, which are officially called the Declaration of Principles on Interim Self-Government Arrangements, aimed to resolve the Palestinian–Israeli conflict (Watson G. R., 2000). It was the first direct contact that led to the initial agreement between the Israeli Government and the Palestine Liberation Organization (PLO). By these accords an attempt was made to build the main framework for future negotiations and relations between both sides, which was supposed to resolve all upcoming 'final status issues'. According to the Oslo peace accords of 1993, these territories were supposed to finally become a Palestinian state. However, after years of Israel continuing to confiscate land and conditions steadily worsening, the Palestinian people rebelled against the status quo. The second Intifada began at the end of September 2000.

### F) The Second Intifada (since Sept 2000)

The Second Intifada, which is also known as the 'Al-Aqsa Intifada', is not the first in the history of the Palestinian people. Palestinian resistance will not be the last if it continues under oppressed conditions, occupation, and killing the aspiration of the Palestinian people in the formation of an independent state including the Palestinian Christians and Islamic holy places. The Palestinian people seek to defeat the occupation and work to build a society where justice, equality, security and stability exist. The result of this uprising and what followed it was shocking acts and violent incidents, which are a direct result of despair (Nafaa, 2002) (Qarae, 2002). This despair arrived in the Palestinian streets seven years after the signing of the Oslo Accords. Regardless of its advantages and shortcomings, after all this period, it did not give people the hopes that they had been promised and neither did it achieve their aspirations and dreams that they were looking for (see Appendix 12). In addition, the ordinary citizens did not gain or feel the advantages of this agreement on the land, which increased stress in different classes of people, who turned to violence and rebelled against the situation. The Palestinian streets, in all categories, staged their uprising in response to Ariel Sharon's provocative visit in the company of 300 armed guards to the Al-Aqsa Mosque, which is considered one of the most holy places among Muslims. This act stepped up the crisis in September 2000 (BBC, 2000).

Events developed from peaceful marches and throwing stones into violent confrontations in which heavy weapons were used against Palestinians. The Palestinian people did not know how they should act because they had not faced such a situation in the previous Intifada between 1987 and 1993 (Stone Intifada), when the local people used only stones to fight the Israeli military machinery (Abunimer, 2003).

#### 2.1.1.4. Summary

The convergence of interests between the colonial powers at that time and the Zionist political movement in the formation of a national homeland for the Jews in PS without doubt is considered the beginning of this conflict. In addition, bringing millions of new Jewish immigrants to PS after the establishment of the Jewish state has complicated the conflict. It is clear that that was the beginning of serial setbacks for the Palestinian people, which has created a state of instability in the region.

The political instability and ongoing conflicts over this land are considered the main factors that paralyse or delay the development of the education sector in PS. The improving of the education sector needs a stable government that is able to establish strong and effective institutions that have the powers and resources necessary for the advancement of all sectors and institutional services, which include the education sector at various levels. The main duty and task of those institutions will be the enactment of laws and the necessary legislations for developing their community and organising people's lives. Therefore, by considering the Ministry of Education as of one those governmental institutions that supervises early childhood education and the mechanism of the process, and that establishes and licenses their facilities, this sector has been directly affected as a result of the unstable situation.

In order to have a wider understanding of the current situation of KG in PS, the second part of this study will present further factors that could affect this sector. These key factors are:

1. Culture and social structure
2. background to PS environment
3. PS education system
4. KG users' needs, difficulties, and problems
    a) external factors: the war in PS and the consequences of war on the education sector
    b) internal factors: the financial and administrative corruption of the PA, and the lack of laws governing the granting of licences for the establishment of KGs, and the lack of awareness.
5. case studies from different countries

### 2.1.2. CULTURE AND SOCIAL STRUCTURE

Arabic is the major Palestine language. However, because Palestine has traditionally had a multi-ethnic society, quite a few languages were spoken in Palestine in the early days. However, it should be pointed that the most of these languages have now declined under the supremacy of Arabic, which is not only the official language in Palestine but also the most widely spoken language of the country. Hebrew is the most prominent minority language of Palestine. Israelites form a minority community in Palestine, and they continue to speak in Hebrew. In addition, a number of European languages are also spoken in Palestine but English is still the preferred language, especially among the educated class (Jaber Y. , 2012).

Religion in Palestine mainly includes a large section of Sunni Muslims and a considerable section of Christians and Jews. The Islamic community accounts for 88% of the population in Palestine whereas the Jewish community (Israeli settlements) in the Palestinian Territories accounts for approximately 17% of the population in West Bank. In addition, there are about

0.7% of people in the Gaza strip and 8% in West Bank are Christians (PCBS, 2008).

This part of the study will clarify the social structure of the Palestinian family and the role that it plays in the concept of KG. Arabic names are based on a long naming system; most Arabs do not simply have given/middle/family names, but a full chain of names. This system is in use throughout the Arab world, including PS. This reflects the importance of each of the families and tribes and their place in the Arab community.

Halim Barakat (Barakat, 1986, p. 224) describes and identifies the social structure of the traditional Arabian family in four properties.

1. It is a social union constituting the nucleus of social productivity; the centre of economic and social activities based on cooperation and mutual commitment and affection.
2. It is a patriarchal family in terms of concentration of power and responsibility, in terms of membership.
3. It is a hierarchical family on the basis of sex and age.
4. It has an extended family structure that is changing to a nuclear family structure. The extended family structure in the Arabic area includes three generations from the same family, all of whom live under the same roof, and its members cooperate economically. They also share the responsibilities, duties, interests and loyalty. This includes grandfather, son, grandson, uncles, aunts, brothers, sisters and cousins.

Therefore, Arabian families share joys, sorrows, honour and shame. This union makes a lot of decisions by family decision rather than individual decision. The father plays a vital role in the Arabian family structure because he is considered the head of the family and is located on the top of the pyramid.

All of the above leads to putting young children under the care of older members of the family. Grandmothers and old aunts care for children at home whilst the father, mother and brothers go to work, whether in agriculture or other professions. Thus, aunts and grandmothers have played the role of KG carers since ancient times, which has led to a sense of irrelevance and a lack of interest in the establishment of KG facilities in the Palestinian Arab society since ancient times. In addition, it explains the delayed entry of the KG concept to this area, especially when it is compared to European countries that had the industrial revolution which required all adult members (both genders) to participate and go out to work. However, according to Fahmeya Sharaf-Addeen (1996, p. 235), this role has started to change, with the beginning of a change in the structure of the Arab family in the 1920s. It occurred by shifting the extended family to a nuclear family. These changes led to a change in form and content of the extended family, and contributed to the emergence of the small nuclear family that is independent in terms of housing and economic source. These changes occurred for a number of reasons, such as the wide migration from villages to cities for work, travel abroad for study, and dispersion of Palestinian families due to wars (Barakat, 1986, p. 203). The need for early child centres, such as nursery schools and KGs, has increased rapidly, especially given that the Arabian community is becoming aware of the important role that women workers (women's paid labour) can play in developing their countries and improving the income of their families (Sarhan, 2005, pp. 36-39).

## 2.1.3. THE NATURAL ENVIRONMENT AND BUILDING TYPOLOGY OF PS

### 2.1.3.1. PS Geography

Palestine is in the Middle East. It can be located at the western part of Jordan. The geographical coordinates of the location of Palestine are 32º North latitude and 35º 15'' East longitude.

Travellers to Palestine can reach there by air, as there are three airports at Palestine. The location of Palestine plays an important part in moving the features of the climate of the region and also for the variety of climate between the north and the southern parts.

Palestine has an illustrious tactical and geographic position as it lies at the centre of ancient trade routes between Europe, Asia and Africa. The Palestinian location is also very important as it is considered to be the Holy land for Muslims, Jews and Christians.

The geographical location of Palestine also assists in the profitable activity of the place. All the marketable groups that come from the eastern side and move towards the western side pass through Palestine. The goods that come from the Arab Peninsula and Asia first reach Palestine by land and then pass on to Europe through the Mediterranean.

#### 2.1.3.2. PS Climate

According to Rafeek Alnatsheh (Alnatsheh, Yaghy, & Abu-Alia, 1991) and Mustafa Addabbagh (Addabbagh, 1976), in the PS climate the winter season lasts for three months, when the temperature may fall to zero with the possibility of snow in some areas such as Nablus Province. The rainfall season is usually from November until February and the amount of rainfall really depends on the height above sea level. Thus, it rains much more in the mountains than it does on the plains. The hottest months in the climate in PS are between July and August, when the temperature reaches up to 35 degrees Celsius (around 95 degrees Fahrenheit).

However, in the remaining months of the year the PS climate remains enjoyable because it remains moderate in nature. The winds are cold and gentle in the highlands in the summer; even in the hot summer days people may require to wear sweaters in the evenings as a result of the gentle wind that blows from the Mediterranean Sea. From April until the middle of June, PS is affected by the annual hot, sandy, dry winds as a result of the dusty ‘Khamseen’ wind, which comes originally from the Arabian Desert. PS has an average of seven hours of sunshine in the winter and in the summer season there are about thirteen hours of sunshine per day (PMD, 2009).

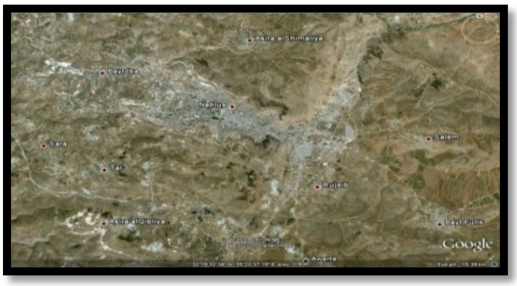
For instance, the annual report of PCBS in 2004 indicates that the highest duration mean of sunshine was 12.6 hour/day in Hebron station in June, while the lowest duration mean of sunshine was 4.1 hour/day in Ramallah station in January (PCBS, 2004).

It be pointed out that, although the land constitutes a very small geographical area, there are considerable differences in temperature. For instance, Mount Alsheekh towers 2,814m in the north and Mount Eibal in Nablus towers 940m above sea level, whereas the Dead Sea in Jericho Province is approximately 423m below sea level. Therefore, Nablus City and the North West Bank are summer favourites for locals and foreigners alike. Spring in PS is beautiful and it is considered the best months in the whole year. The PS atmosphere is fresh and the air is unadulterated at the region (Saleh, The land of Palestine and its people, 2001).

The Nablus Province has been chosen for this study because of its mid-location and

a) The Middle East

b) Palestinian Territories and the West Bank



c) Nablus Province

**Figure 3: The above photos (a-c) have been taken by Google Earth (October 2011)**

elevation in this area (Figure 3). The average elevation of Nablus Province is approximately +550m, which is located between the lowest elevation on the Earth's surface on the Dead Sea, -423m in Jericho City, and Halhul City in Hebron Province, which is considered the highest inhabited place in the West Bank (+700m). This gives Nablus Province a temperate climate, which is closest to the majority of the cities and villages in the Palestinian Territories (the West Bank) (see Appendix 3).

#### 2.1.3.3. PS traditional buildings

**(The universal characteristics of PS buildings 'houses' that have been converted to KGs)**

**A) The importance of studying the PS housing patterns and their relation to the current KG patterns in PS**

Almost all KG buildings in the study area have been converted and modified to serve the KG aims[7], and all of them were not originally built as a KG facility. In addition, because the old PS traditional houses have been targeted by the local PS investors in this field[8], studying the traditional houses will be vital to this study. Then, this part of the study will focus on the common patterns that have been used to convert traditional houses to KGs in PS (for more information about this important point, please return to pp. 43 and 44 in this study).

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[7] Except one case in Nablus City (among 90 KGs) where is a KG that were been built in 2011. This KG originally built to be a KG and to serve its aims. This KG was built by the international community and it is now run by MOHE

[8] For more information about the previous important point, please return to page 89.

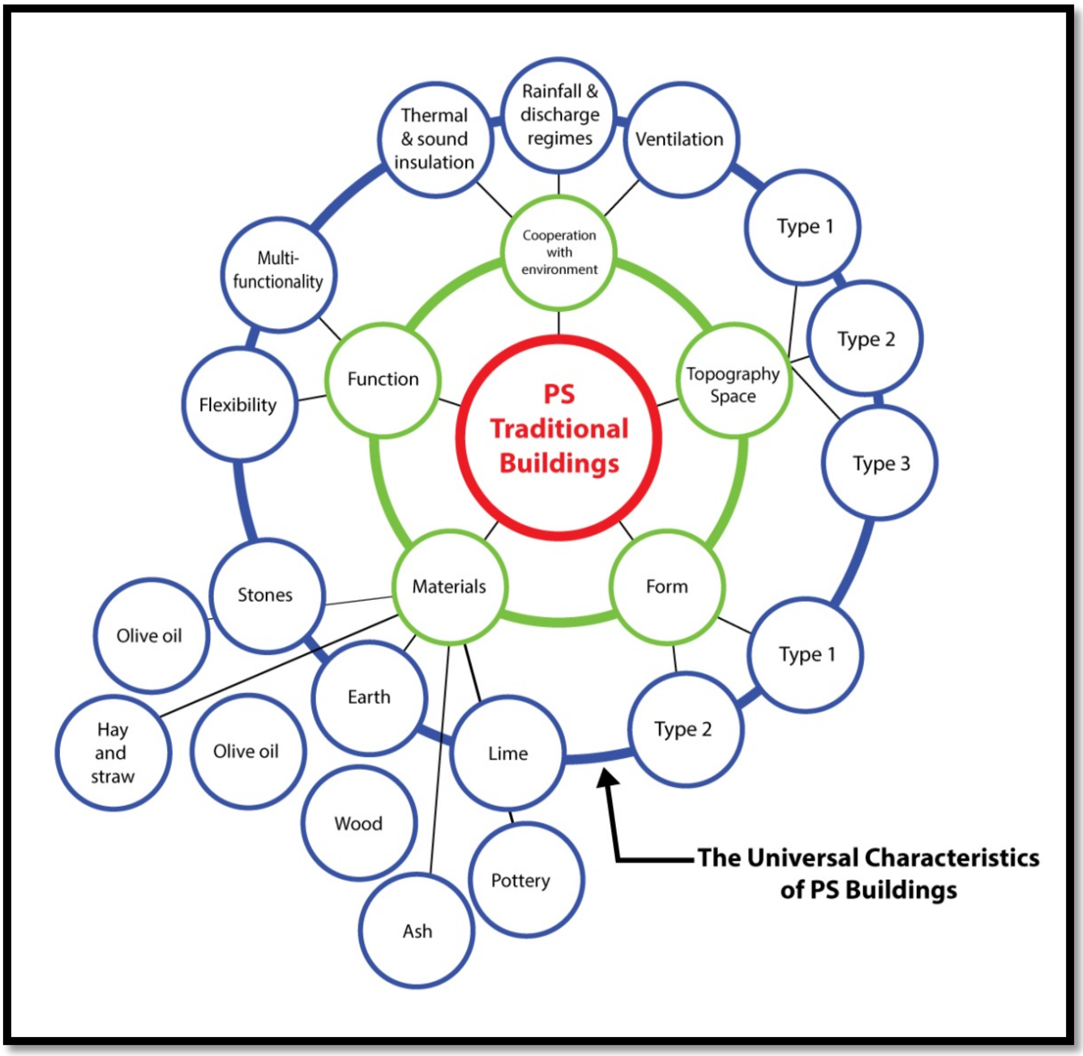



Figure 4: The framework of the case study (PS traditional buildings)

### B) Topography spaces

According to Shokry Arraf (Arraff, 1985) and Omar Hamdan (Hamdan, 1996) there are several types of PS traditional buildings, which can be divided depending on the topography of interior spaces:

**Type one**: The sample houses generally consist of one to three rooms. These houses were usually inhabited by artisans, workers in the local industry, and farmers, who were the majority of the Palestinians. Those people were considered low and middle class in the past. Thus, they are simple in their structure, materials and decoration.

**Type two**: Middle sized houses generally consist of four to seven rooms, which were usually inhabited by educators and professionals forming the higher class, such as some big farmers, landlords, teachers, doctors, traders, and senior officials of the state. Thus, some decorative works in the ceiling and walls, and marbled or coloured tiled flooring can be seen in such houses.

**Type three**: Large houses generally consist of 20 to 60 rooms and rarely exceed that number. However, there are those such as Abedellhady's house in Nablus City that was built in 1820 and has 144 rooms, and Jarrar House in Jenin City, which look like palaces. These houses used to be inhabited by the aristocratic families and lords from the feudal age in the Ottoman Period. Today, these houses are usually inhabited by extended families, which can reach up to 30 nuclear families such as in Abedellhady's 'palace'. Those families not only share the 'palace' but also share the same roots. In Abedellhady's house the minimum size of any room is $30m^2$ and at least 7m high. The house walls are not only strong and durable because of their thickness and being built with stones but also because the mortar is made by mixing olive oil with lime and earth, instead of water as the majority of people used to do. Thus, this type of house is often unique, impregnable, strong and luxurious (Amiry S. , 2003).

It should be pointed out that the type two of traditional building is considered the best choice for investors in the KG field to be chosen to be converted to KGs. They have plenty of good size rooms, which are enough for a mid-size KG. In addition, this type of building usually has a good size garden and backyard, which will be excellent for children's outdoor activities. In contrast to type one, it often located in the centre of the old cities and among commercial, crowded, residential neighbourhoods, which gives a good chance to earn a quick profit from the early education business in such locations. Moreover, types one and two are considered cheap building alternatives to rent, and could be ready to be used in a short time and with a minimum cost, especially with the absence of health and public safety conditions, which this sector has suffered from.


**Figure 5: The traditional building patterns in PS that have been converted later to KG facilities**

Today, the majority of converted KGs are originally from type one and two of PS traditional houses (Figure 5). However, as a result of growing families, those who originally inhabited these traditional buildings found it necessary to attach rooms in different eras, which were so important to keep up with the growth and expansion of the family. Moreover, because type one has only one to three rooms, which sometimes is not enough for a KG, the importance of building new attachments such as lavatory spaces or usable storage space in a KG is required. This leads to finding converted buildings for KGs with a variety of styles and building materials, depending on their age. This explains the overlapping of more than one style of building, which can be seen in the type one buildings, and can also explain the use of a variety of materials.

Therefore, this study will focus on types one and two in the next part and also will work on presenting their patterns, architectural openings such as doors and windows, and the most important characteristics and distinguishing features, in addition to their advantages and disadvantages, in particular with regard to re-using them currently in KGs after applying some adjustments to them.

**- The topography of exterior spaces**

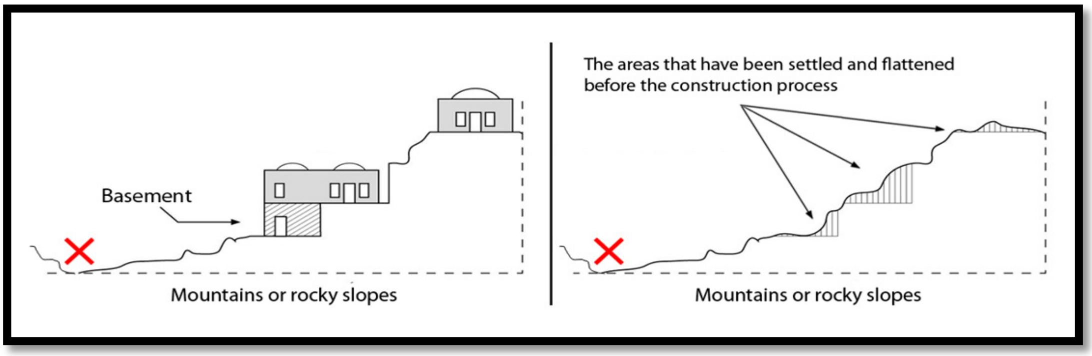



**Figure 6: PS traditional houses were been built on the tops of mountains, hills, rocky slopes with avoiding the course of valleys.**

**- The topography of interior spaces**

a. Type one

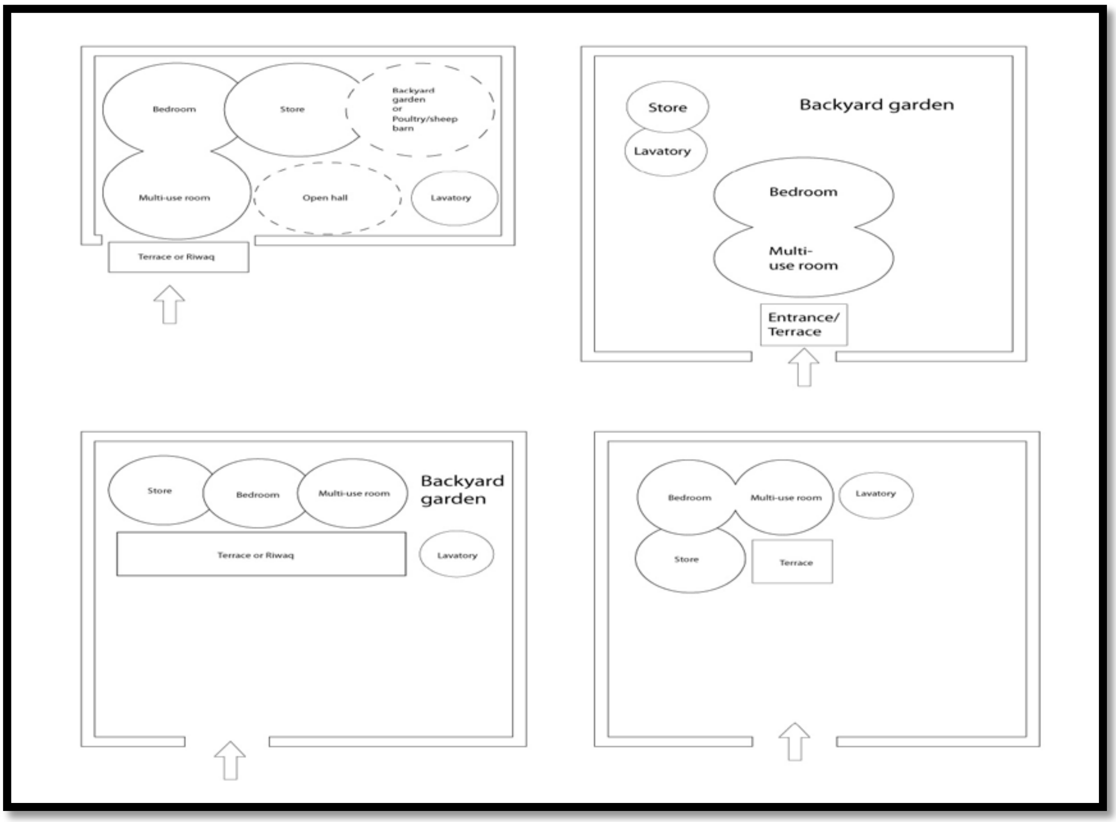



**Figure 7: The general distribution patterns of traditional houses in PS (type one)**

b. Type two

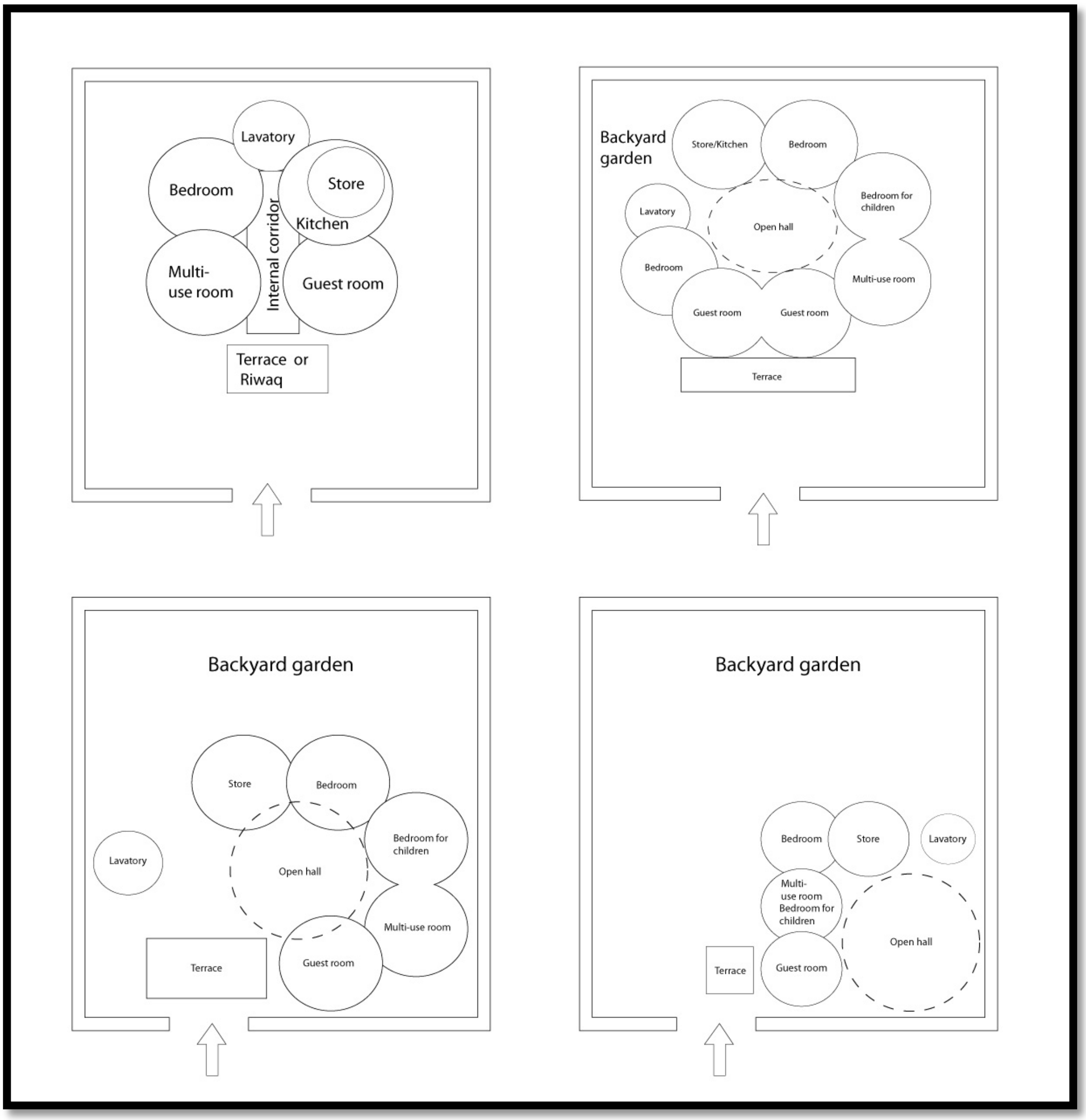



**Figure 8: The general distribution patterns of traditional houses in PS (type two)**

c. Type three

Type three will not be covered by this study because none have been converted to KG facilities in PS.

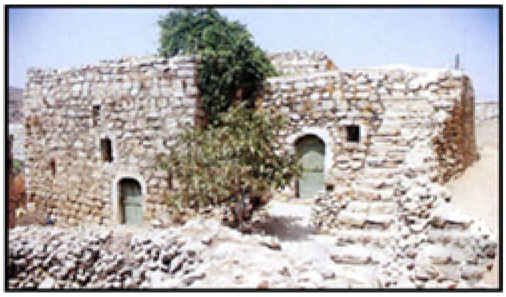
### C) Form

The general view of PS traditional houses

a. Form: Type one

a) Kafr Malik Village

b) Bayt Jibrin Village

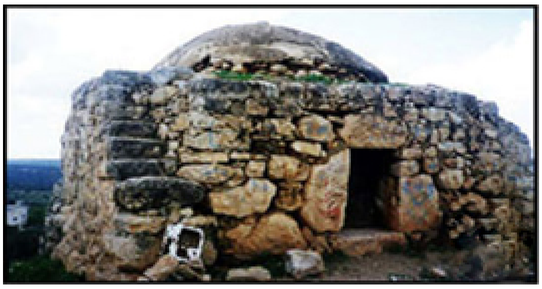


c) Talluza Village

d) Kafr Rai Town

e) Jayyous Town

f) Birzeit Town



g) Dura Town

h) Dayr Al-Qasi Village.

**Figure 9: The above photos (a-h) show the general view of PS traditional houses (type one)**

What can be seen from the type one PS traditional house (Figure 9) is that it is characterised by architectural simplicity, small size in structure and it lacks decoration. Therefore, it has less PS characters as a result of its size and avoids what could be considered unnecessary steps such as decoration and engraving on the walls. Moreover, these houses are not usually enough by themselves to be converted to KG use as a result of their small size. Thus, if they are required to be converted, they often have to have some rooms added, such as lavatories and a kitchen, and they need a lot of maintenance work before they can be used as an early educational facility.

According to Diala Khasawneh (Khasawneh, 2004) type one is considered inexpensive and often consists of one to three rooms. Its windows and doors, which were usually purchased, are quite small in order to reduce the cost. Ordinary people did not have enough experience and ability to make windows and doors, in contrast to the actual construction of the house itself, which was built by the owner with the help of his extended family and his neighbours. This was especially so if the building process was in the countryside, villages or even small towns, where all the people of the same village would give a helping hand. In the past, the landlords of this type of house did not hire workers, but often needed only a supervisor, whose job was equal to an architect. The supervisor had the responsibility of overseeing the construction process, its development and measurements, and determined the method of construction that should be followed. It can be inferred from the above that, as a result of the small size of the windows, these houses usually suffer from a lack of sunlight. Therefore, if one of these houses has been converted to a KG facility, all these characteristics and problems will be shifted to the KG.

It should be pointed out that, in the West Bank region, whatever the type of traditional house (type one, two or three), the majority of these houses were built with white stones, lime and earth. This is a result of the availability of these raw materials in the local environment, which explains the white colour of these houses (Figure 9-12).

It is noticed that the ‘Dome style’ has started to disappear since the widespread use of cement, concrete and iron rods that were removed from old railway lines after the Second

World War (Figure 10). The use of concrete and iron bars in the ceiling has become widespread instead of the domes in buildings, whereas the methods of building traditional walls are still the same but with a reduction in their thickness. There is no need for this thickness to carry the weight of the dome and the upper floors, as PS traditional houses do not normally exceed one floor. They may reach three floors in types two and three but not in type one.

**- Domes in the “Aqid” houses from (type one)**

a) Domes in simple traditional houses in Asira Sh. Town (the historical area)

b) Simple house shows the materials and the methods of construction in Alkasaba, Nablus

c) Section in a dome of a traditional house (type one), The old city, Nablus

**Figure 10: The above photos (a-c) show the domes in PS traditional houses (type one)**

b. Form: Type two

a) Qlebou's House – Jerusalem City

d) Al-Bireh

b) Bayt Sahour Town

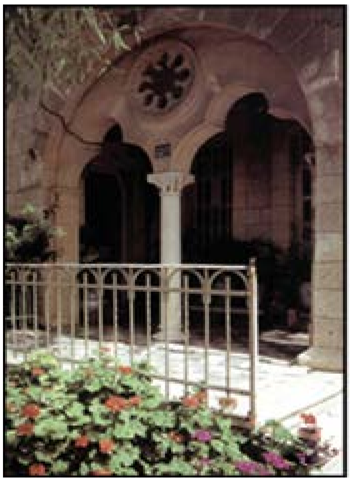
e) Al-Emam's House- Hebron City

c) Nablus City

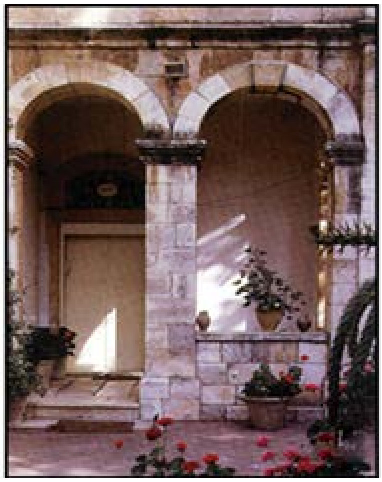
f) Dar Alian in Elbeera Town

**Figure 11: The above photos (a-f) show the general view of the traditional houses in the West Bank (type two)**

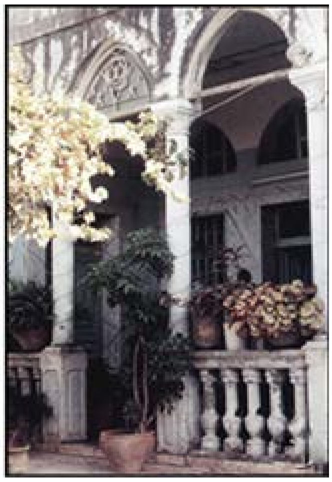
### ‘Riwaq’ in type two



a) Two arches from the ‘Malfook’ type, with a small window between both of them. They are located in the House of Qlebou in Jerusalem, built in 1930.



b) Stone Riwaq with a Roman arch, at the house of Dar Al-Husseini in Jerusalem, built in 1902.



C) Stone Riwaq with pointed arches in the heads at the House of Essabe’e in Qalqilya City.

**Figure 12: The above photos (a-c) show some riwaqs and arches in the PS traditional houses (type two)**

**Windows in type two**

a) Wooden window, or 'Mashrabeya' overlooking the main road of 'Khan Merchants' in Nablus City. The window is raised on stones, and a facet of the home contains five windows, longitudinal, identical and contiguous. These windows contain iron bars for safety and protection.

b) Window made from glass and steel, and containing steel blades, with ornamental stone above. Al-Husseini's house in Jerusalem, built in 1902.

**Figure 13: The above photos (a-b) show various forms of windows in PS traditional houses (type two)**

**Windows in PS traditional houses (type two)**

a) The right photo shows a double rectangle window with double arc window above. The kind of arc here is a ‘half five’ and there is a Roman arc that gathers them. The window is made of wood and glass, and contains an iron guard for protective purposes. This style was widespread in type two and is seldom seen three.

b) One single window has a Romanian arc above; it also contains a small square window as a vent that can be opened and closed. This window is made from wood and glass, and the iron bars have a flat shape for protection with a simple configuration, and a "guarding net”. The window has two parts, so that they can be opened partially or completely. The thickness of the wall below the window can be noted here, which is wide enough to be used as a bed in which to sleep, especially in the afternoon of summer days when the temperature rises, where the breeze from the window streams inside as a moderator of temperature. This style can be found in types two and three only.

c) The left photo shows a common design pattern in the Palestinian house entrance that has a gate in the centre. The gate and the two windows in the photo contain the same type of arc,

**Figure 14: The above photos (a-c) show windows in PS traditional houses (type two)**

namely the 'Almaghboon Arc', which means the uncompleted arc or aggrieved arc. The windows and gate have the same sort of opening vents, and also contain iron bars for protection. This style is widespread in type two and could be found in type three (Figure 16).

**'Munawar' vents in type two**

a) A square vent contains horizontal wooden blades, which have the ability to be opened and closed by changing the degree of the blades. It has an iron protection. Mengo's house, Nablus.

b) A vent in Haddad's house has a floral metal decoration in the middle for protection. Built in 1928.

c) An arch vent, which is located above the main door, in Nablus City.

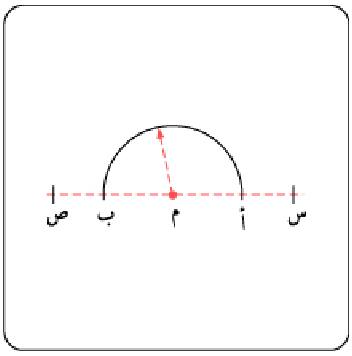
d) An arch vent, which is located above the main door, in Haddad's house has a floral metal decoration in the middle for protection, 1928.

**Figure 15: The above photos (a-d) show some 'Munawar' vents in traditional Palestinian Houses (type two)**

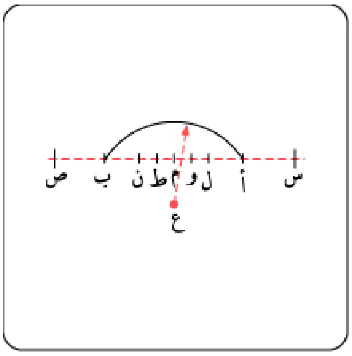
## Traditional floor tiles in PS (types two and three)


**Figure 16: The above photos (a-f) show some of traditional floor tiles in PS, which are common in all Traditional houses (type two and type three) whereas they are rarely seen in type one. When seen in type one, this kind of coloured tiles will be located in the guest room only.**

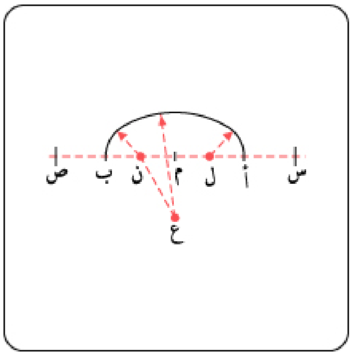
**The forms of arches that are used in PS traditional houses**



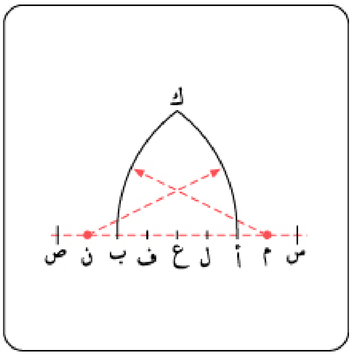
a) Romanian arch



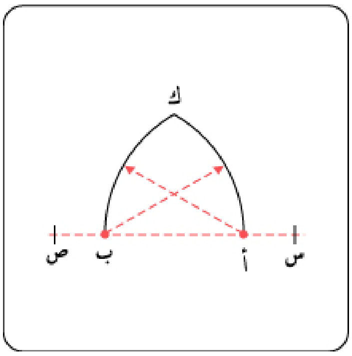
b) Uncompleted arch



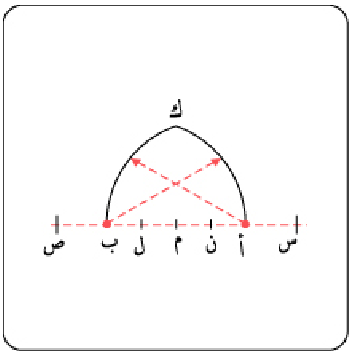
c) The one fifth arch



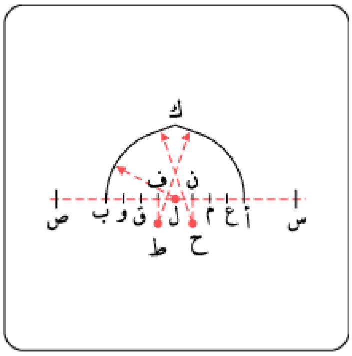
d) Sharp Persian arc



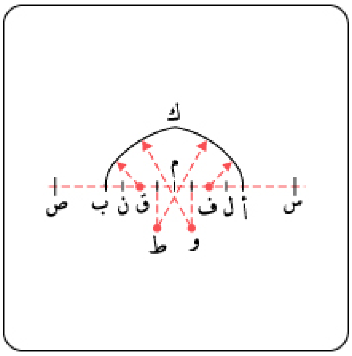
e) Balanced Persian arc



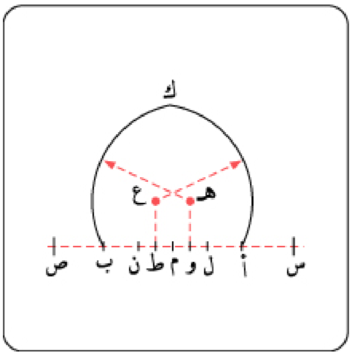
f) The half of one fifth arch



g) Arc with three centres

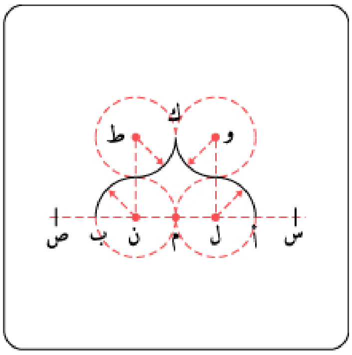


h) Arc with four centres

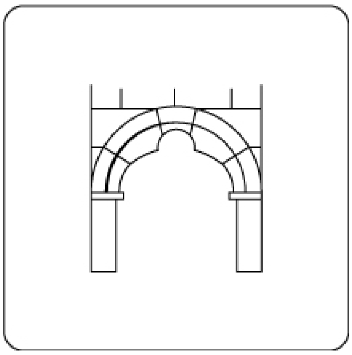


i) Moroccan arch

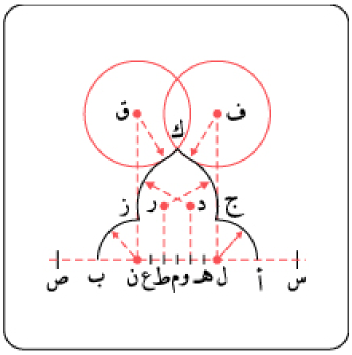
**Figure 17: The above photos (a-i) show some arches from all types of Palestinian traditional houses (Abuhannoud E. , 2006)**



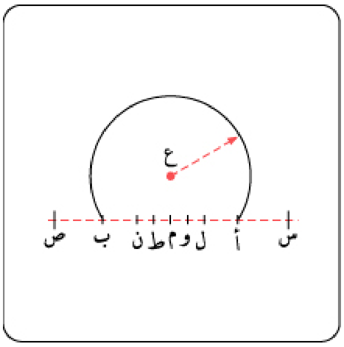
a) Peaked Romanian arch from inside and outside



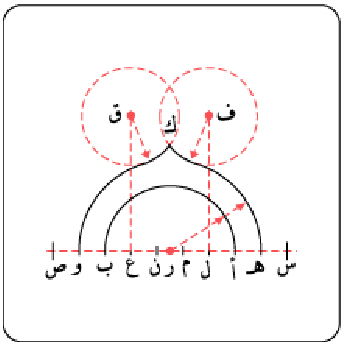
b) *'Malfooq'* Arch



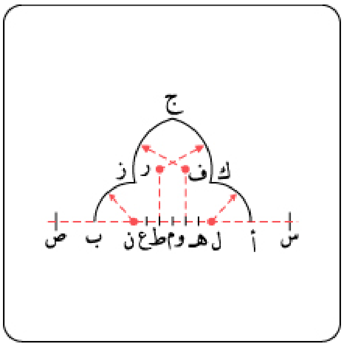
c) The nested, compound and pointed arch



d) Horseshoe arch



e) Peaked Romanian arch



f) Nested or compound arch

**Figure 18: The above photos (a-f) show some arches from all types of Palestinian traditional houses (Abuhannoud E. , 2006)**

In general, the methods that have been used in distributing the rooms in the traditional PS houses (Type 1 and 2) as well as the design language that is used in the windows, doors, '*Riwaq'*, domes, arches, coloured tiles, vents, and the method of construction are all elements that highlight the architectural characteristics of the PS traditional dwelling. These architectural characteristics shifted inadvertently to the majority of KGs later when they were converted to KG facilities. Therefore, all these features can be used to reflect the culture and heritage of the local people by keeping using its general characteristics. The maintenance and preservation of existing elements in certain buildings and the re-use of their main lines and features in new KG buildings will be priorities to transfer this unique heritage and distinctive identity to subsequent generations.

### D) Materials

According to Omar Hamdan (Hamdan, 1996) and Diala Khasawneh (Khasawneh, 2004), the raw materials that have been used in PS buildings are varied, and they have played an important role in architecture since ancient times. They have proved their durability and resistance to climate change and elements over the ages, and responsiveness to the needs and desires of the residents in all categories, depending on their availability. The availability of these raw materials in the local environment leads to technical personnel and skilled workers being capable of dealing with these materials professionally.

These architectural materials in the PS society have an impact on the architectural compatibility of buildings and harmony with the local environment, climate factors and social factors. They meet PS people's needs in the simplest and cheapest way with the highest possible quality (Abuhannoud E. , 2006).

Building materials (Hamdan, 1996)

a. <u>Stones and their derivatives</u>

   Although PS traditional buildings are made from different materials, such as lime, ash and earth, stone is still considered the basic structural element in the PS building. This material exists in various types of homes in PS. Different kinds of stone, which are good for building work, are readily available in the local area generally, especially in areas of the mountainous half-coast. The stones vary greatly in the PS environment, in terms of the colour of the stone and the extent of the quality: some are red, pink, pure white and yellowish-opaque, as well as black and green. They are also diverse in terms of density: transgressing from the strong and very strong, to soft and medium hardness.

   Based on the above, the culture of stone building has spread in various aspects of PS. Thus, it is rare to see a village or town that does not have workers, crews and experts skilled in this craft. PS did not import stones from other villages because the local people believe that the best material for your homes comes from your own environment.

Different classes and groups are advised to use what is available in their environment and avoid importing from outside of the various building works. Therefore, importing building stones from different areas was limited to some rich families, if they wanted to obtain special types or colours of the stones for prestige.

b. Lime

This is one of the first materials used in the old PS buildings. It has been used in the preparation of clay for pasting stones together, instead of the cement used today. It used to be mixed with water or olive oil with different ratios depending on the purpose of the user. This sort of clay can be noticed in the pouring of the foundation, used in building walls, in the operations of plastering and processes lining the house, and in installing the tiling process. In addition, it has been used in painting and 'bleaching' of internal walls by mixing it with other materials. It has been widely used in various environments in villages and cities, but the gypsum industry has spread more in the rural mountains due to the availability of the necessary raw material of stones in addition to the fuel of wood.

c. Gypsum

This is extracted from rocks that are rich in sulphate and calcium. This sort of rock is located in abundance in the Jordan Valley. Gypsum is widely used in interior decoration, but it was not commonly used in the architecture of a village (type one). It was more common to see it in type two, in the architecture developed in cities or in the palaces of the rich families of the sons of rural architecture and in the governmental buildings, churches and mosques.

d. Earth

Soil that has been used in traditional PS buildings is of multiple species and qualities, and multiple sources and functions. The methods of preparation were also dependent on the purpose and the methods of use. The provided amounts of soil, as well as the extent of difficulty or ease of production, may differ from one region to another. In one region people may have the type of soil considered good for building work and in quantities that meet the needs of the local community. Moreover, it could be accessible and easy to obtain with cheap methods, whereas this practical sort of soil could be rare in another region. It should be pointed out that the needs of each environment have been adapted so the local people can invest in the available materials in their local environment, to enable the cheapest cost of urbanisation.

Soil has been mixed at a rate ranging between 10% and 50% depending on the functional importance placed on this clay in the durability of the construction.

e. Ash

Building ash consists of the remnants of fire or 'Taboun',[9] which has been collected and sifted to remove remnants of coal and firewood from it. Then it is mixed with other types of dust, soil, clay, gypsum, and lime. It was believed that it takes the place of gypsum and helps the cohesion of the mud; it is used in plastering roofs and terraces or in the PS traditional houses, because it gives a very smooth surface.

f. Pottery

Small pieces of pottery (between 20 to 30 cm tall and with a diameter of approximately 10 cm) were used in the house ceilings and the roofs of some bathrooms to let sunlight enter the rooms. Moreover, it was the method used for ventilation, especially in bathrooms. These vessels are open from one end and perforated from the other side with holes of approximately 1 cm in diameter. Such vessels have been used in the last course of the building for decoration. This type of pottery has been used in the roof arches which cover the markets of ancient cities such as Jerusalem, Hebron and Nablus.

[9] Taboun is a PS traditional clay oven for cooking

g. Wood and tree branches

The wood panels are taken from the stems of trees available in the forest, such as oak, carob, cypress and other species of timber tree. Wood was used in the roofs of PS traditional houses, ceilings, and thresholds for doors and windows; also in various carpentry work, such as on doors and windows and in the production of furniture. In addition, it is used in the moulding process '*Riwaq'*. Trees have been cut to produce wood panels of various sizes to fit the desired function of the timber (Figure 20).

h. Hay and straw

Hay is the soft output from the sorting of wheat and barley. It was mixed with straw and mud to plaster houses and roofs, especially the houses of very poor people. Straw gives plaster the ability of cohesion and prevents it from decomposing for a long time; because this type of clay was not used with lime, it was compensated by the development of hay and straw, which served as the cement of the present day.

i. Water

There is no doubt that water was and is still the basic material for mixing clay for all the different purposes. It plays a vital role in melding the materials in the soil and makes the various interactions that result in the coherence of mud and the other ingredients. Water used to be the women's responsibility; it was their mission to bring water to the construction site and they transferred it on the back of the animals in order to collect it in private barrels (approximately two hundred litres) for each one of them, to be used later (Figure 19). Often women, relatives and neighbours cooperated in such works, as the construction works and the preparations for marriage 'wedding parties' needed cooperation to provide their requirements as much as possible. It should be pointed out that if someone did not cooperate in such acts, the local community believed that not only did he deserve to be admonished but also ostracised (Neeart, 2011).

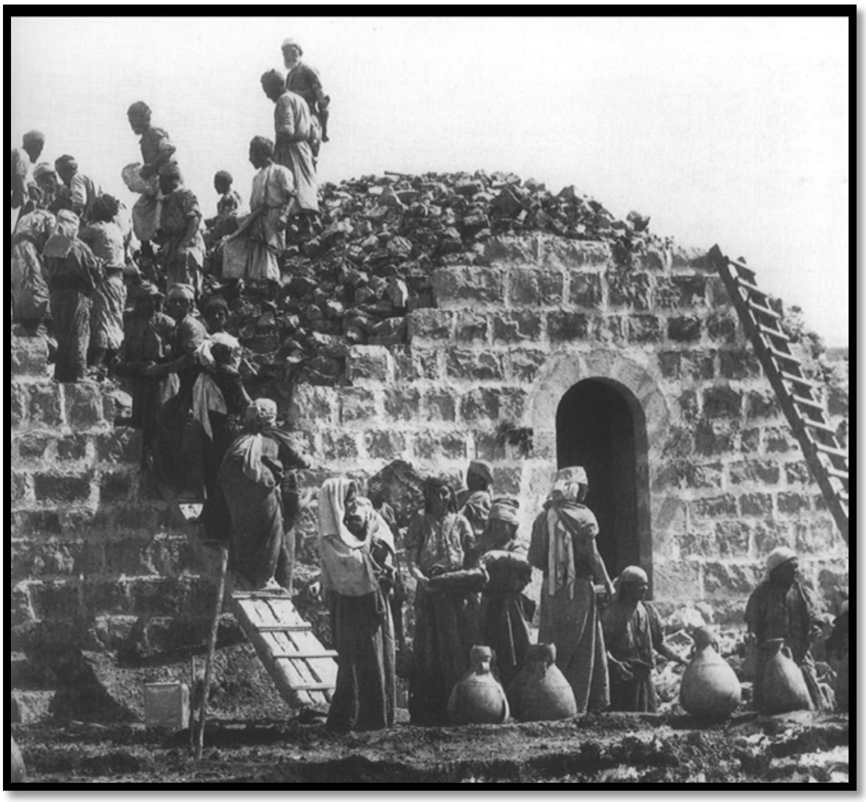


**Figure 19: This Image represents the process of a building contract (type one), which was contributed to by all members of the village, women and men together, dating back to the mid-1920s. (Suad Amiry and Vera Tamari, The Palestinian Village Home, British Museum, Second Edition 2003, p.21, Matson Collection, Library of Congress.)**

j. <u>Olive oil</u>

They used the remnants of oil deposited in pottery jars. Local people used to save thier olive oil in such containers. This kind of oil was used with the clay prepared from lime or soil in the roof of traditional buildings, plastering wells and terraces. It is believed that olive oil increases the durability of construction and makes the mixture last for a long time – 'hundreds of years', which has contributed to the survival of some buildings for a long time (Sholy, 2004). The oil was added in ratios specific to water, where it enters into the buildings and possibly construction as a whole. It may help the interactions between the acid oil, lime, and ‘alkaline’ to create new strong materials. In addition, it helped to isolate the humidity.

### The traditional construction methods in PS

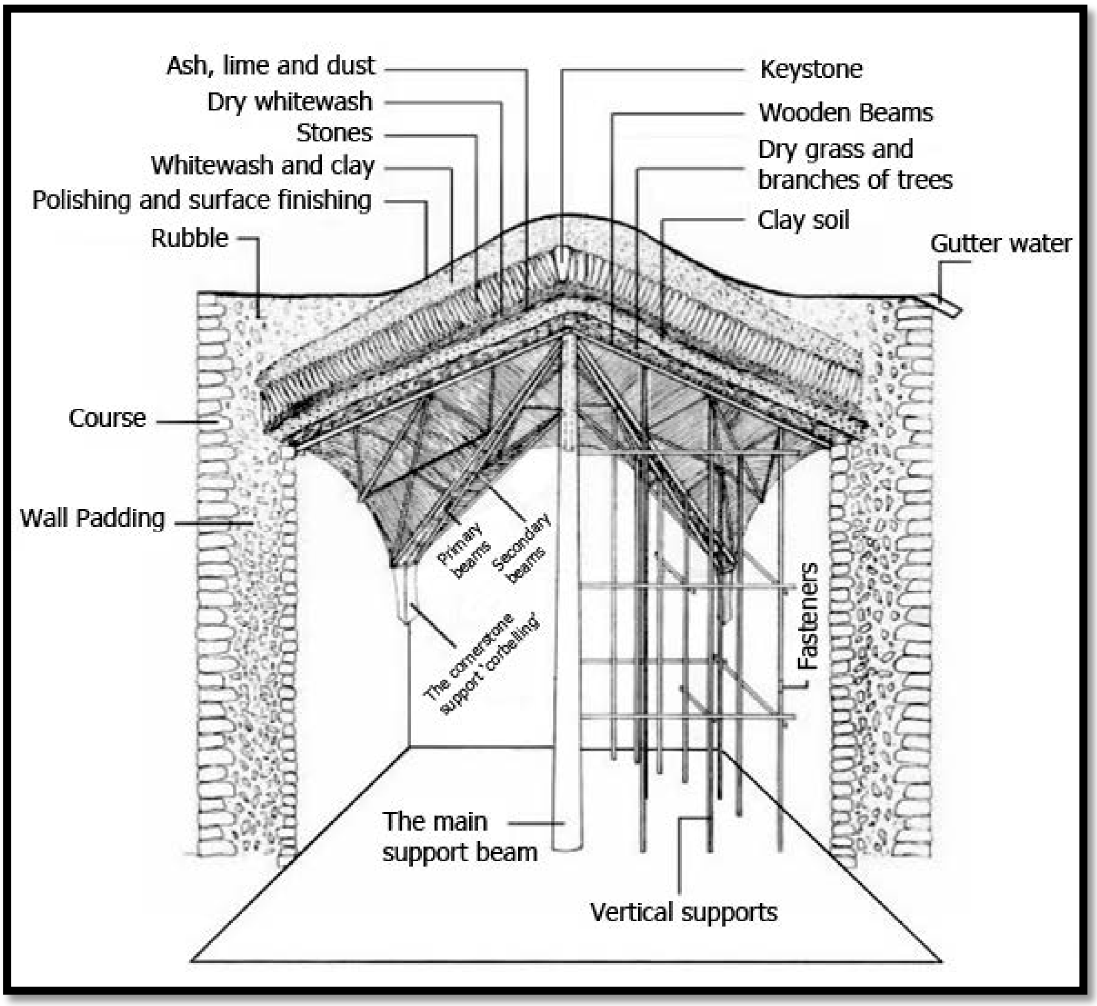



**Figure 20: Section in a traditional house in PS**

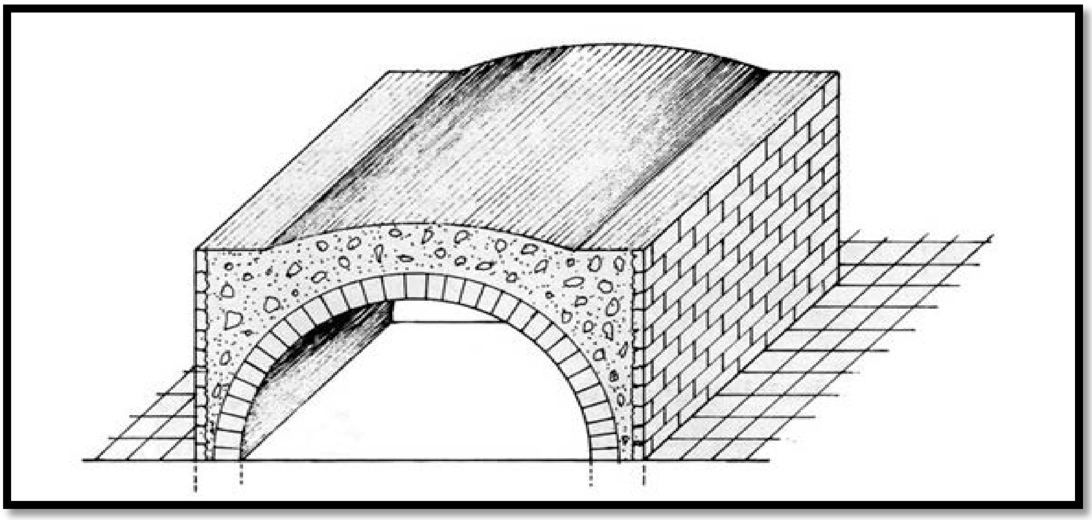
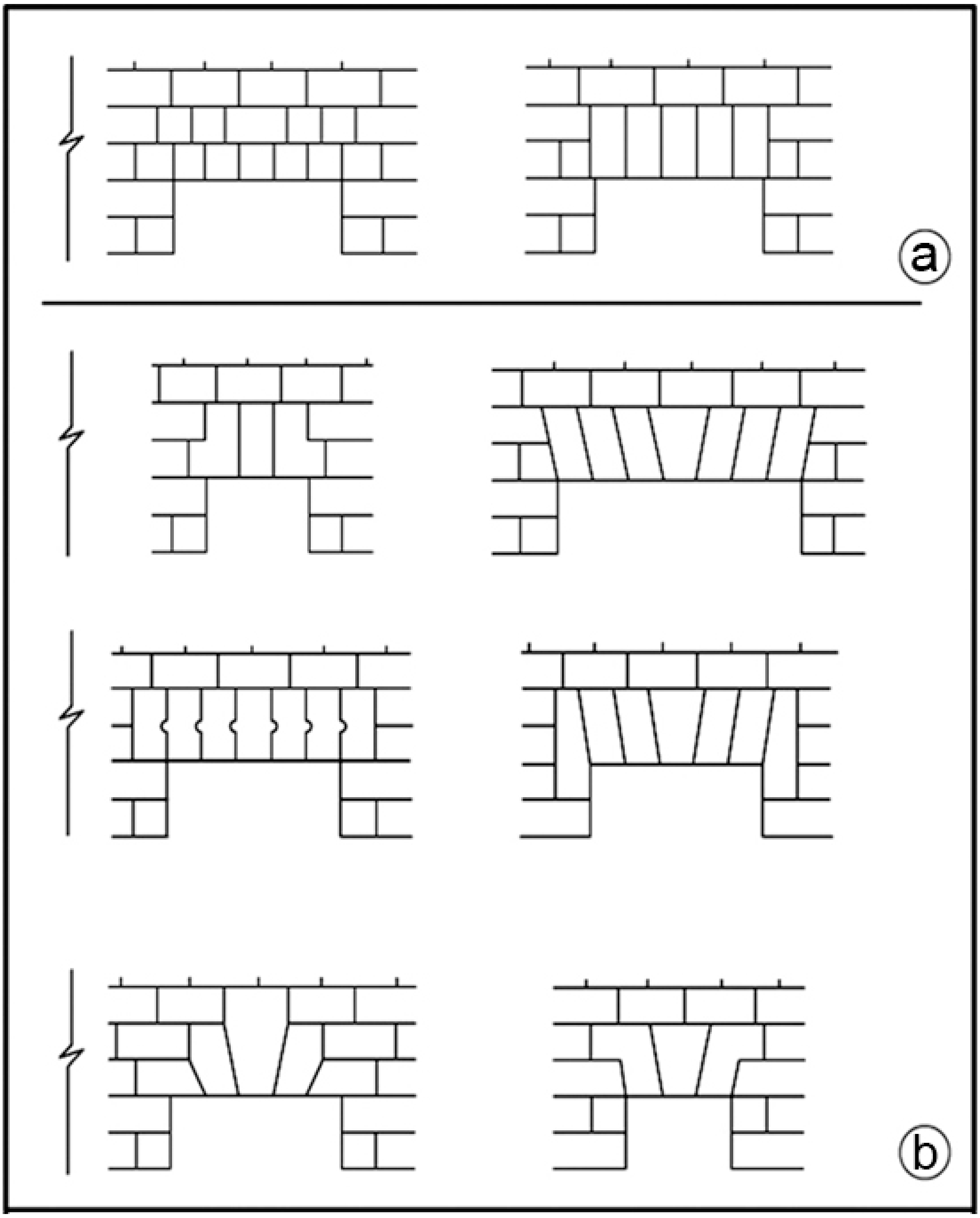


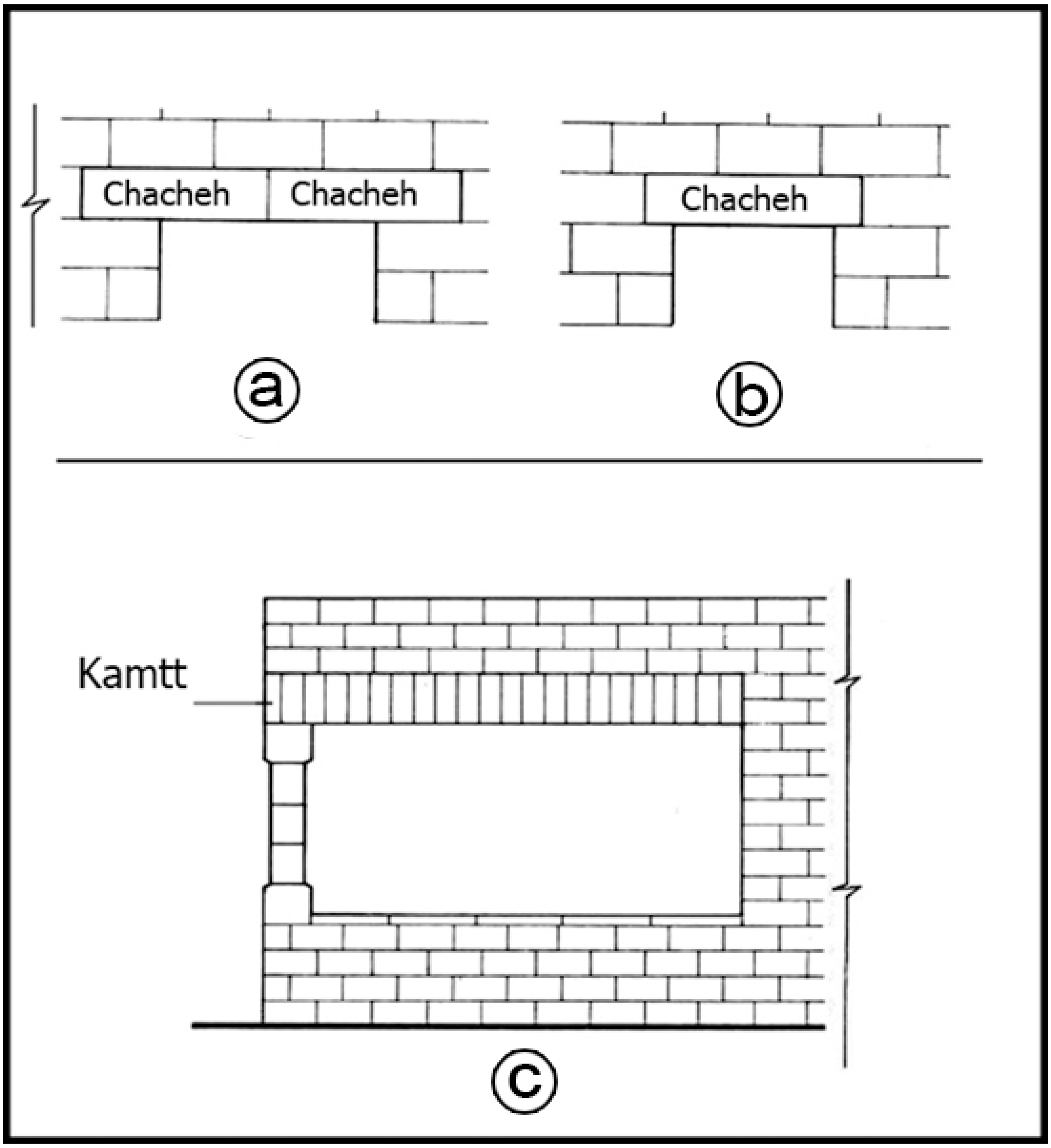
**Figure 21: Section that shows another kind of roof that has been used in traditional building in PS: houses, horse stables and grain stores.**




a) Clamp 'Kamtt' suspended by steel hooks

b) the compound and the mobile clamp on each other.

**Figure 22: The above shapes (a) and (b) show some examples of the common types of clamp, and windows used in the ancient Palestinian buildings**




a) Dual Chacheh, which is used in the ceiling of the window.

b) Single Chacheh, which is used in the ceiling of the window.

c) Compound Chacheh, which used in the roof of the balcony

**Figure 23: The above shapes show some forms of stone 'Chacheh' and its place in the PS buildings.**

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### E) Function

a. Flexibility

The PS traditional houses of poor people in type one homes only have one or two rooms. Therefore, in cases where they only have one room and a terrace, they have not been arranged as permanent living or bedrooms. Instead, rooms have been arranged as needed. For this reason, furniture in other rooms is often portable and pieces like '*Janbeyyah'* mats (Figure 26: C) can be stored in house closets that are located in the thickness of walls, as needed (Figure 24-25). In addition, when there are two rooms or more, the rooms are divided into two parts. The first one is called the guest room, which is used as a living room, sitting room and dining room. However, at night it can easily be converted to be used as a bedroom for young children or for the extended family members (sisters, aunts and grandparents). It may seem like the Japanese style, but here the size of each room is usually up to five times bigger. The size of the guest room in the type one of PS houses is between 18-36 $m^2$.

The second part of the type one room is made especially for sleeping purposes, which is only for parents' use if the house consists of two rooms or more; otherwise they have to share it with all family members (using a piece of cloth attached to separate males and females). It should be pointed out that the average size of a PS bedroom in such houses is approximately 12-16 $m^2$ and will not exceed 20 $m^2$. The guest room is the biggest room in these types of houses, whereas the second room (bedroom) is often much smaller. People in these houses do not sleep on beds; they sleep on a thin mattress, which is rolled up each morning and placed in a wall closet to create more space inside the room. However, in type two PS traditional houses most of their residents sleep on beds (Khasawneh, 2004).

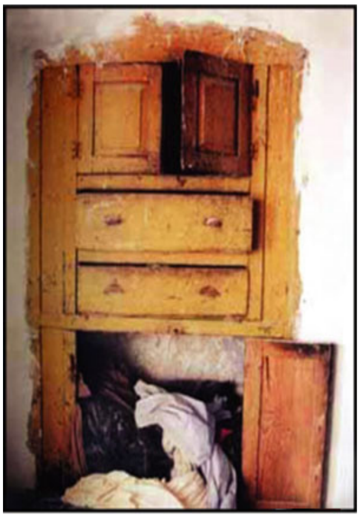

**Figure 24: Cabinets in the internal wall**

In brief, traditional type one and two homes have multipurpose, easy-to-change rooms. Bedrooms are easily converted. At the centre of the room is a low table, which the family sits around for meals or reading a book (Figure 26). The poor PS people spend a lot of time on the floor and even sleep on a hard floor.

**Figure 25: The above photos show the storage spaces in the interior walls *'Qaws Elferash'*. These can be found in all types of traditional houses (type one).**

**General view of interior spaces in PS traditional houses (type one)**

a) Traditional house (type one) shows multi-purpose room with a bedroom, Bethlehem City

b) Traditional house (type one) shows its kitchen and multi-purpose room, Bethlehem City

c) Dining table in the PS traditional houses (type one)

**Figure 26: The above photos (a-b) show the interior spaces in PS traditional houses (type one)**

b. Multi-functionality

**Cabinets in the internal walls in type two:**

The same concept can be seen in all traditional houses (types 1, 2 and 3).

In the cities, it is called a '*Youk'* or '*Qaws Elefrash'*. It is located in the wall and was built at a height of (15-30 cm) from the floor. It is tall, approximately 2m, and wide as it is tall, whereas its depth ranges between 60 and 100 cm. It was often built with a stone arc above it in order to carry heavy loads of wall. It was used for storing thin mattresses, blankets and pillows that are usually used when going to sleep at night and folded in the morning. A '*Qaws Elefrash'* may contain a row of drawers at the bottom for storing tools and various household items. It may be divided by wooden doors with openings of glass in order to close on the mattresses and save them from dust and mice. Some walls may have secret cupboards that have been hidden very well in the wall and may be closed by stones and mud. These caches were used to hide gold coins and guns for fear of theft (Hamdan, 1996).

a) A wooden cupboard that was installed inside the wall and is used in the dining room to keep the pots and dishes.

b) The wall thickness has been taken advantage of to install a cupboard. It was originally built as a *'Qaws Elferash'* before converting it later to be used as a cupboard. Located in a bedroom in Bethlehem City.

**Figure 27: The above photos (a) and (b) show the storage spaces in the interior walls (type two)**

### F) Cooperation with the environment

a. Thermal and sound insulation

All types of PS traditional houses have a high insulation rate for many reasons:

1. The natural materials that have been used in buildings (earth, lime and solid stone) grant a high rate of insulation.
2. The building structure consists of multi-layers of materials (Figure 20 and 28).
3. The thickness of walls (interior/exterior) and roofs, which range between 60 and 180cm (Figure 29-30).
4. Poor people use the minimum number and size of windows in their traditional houses.
5. Use of white solid stone to deflect heat and painting of their roofs with white lime for the same reason.

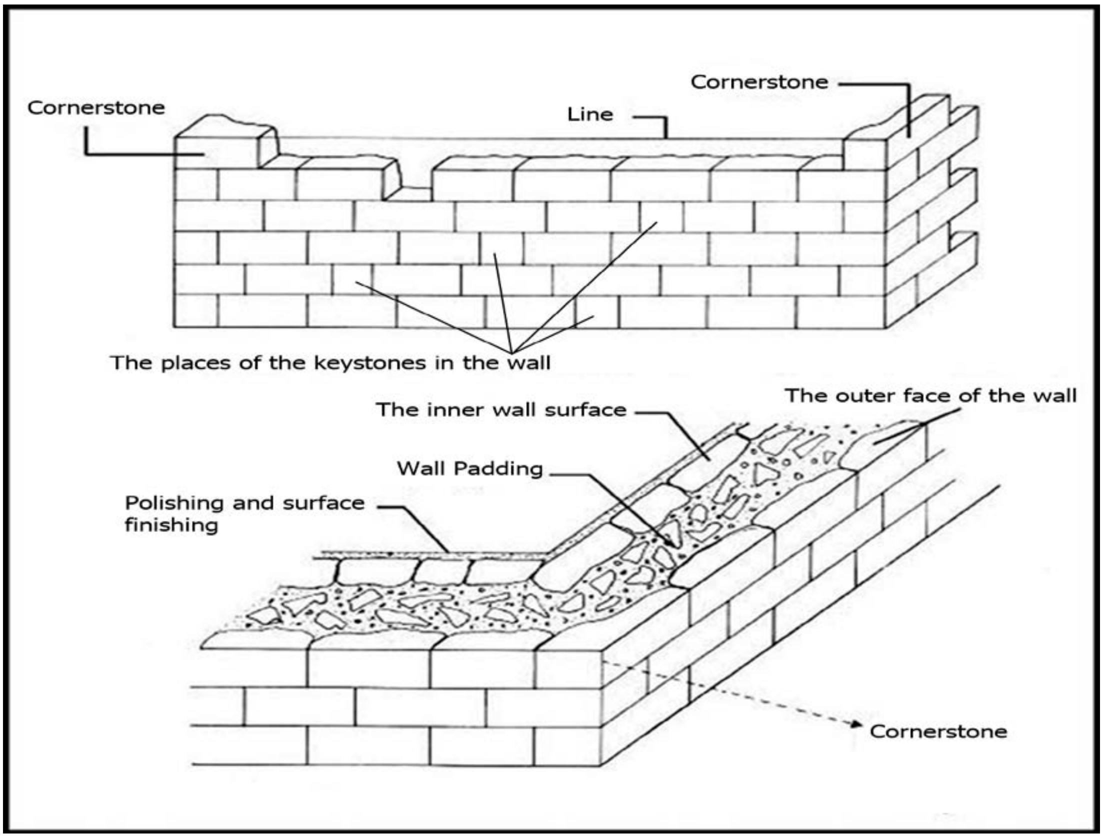


**Figure 28: Section in a wall in a traditional PS house that shows the components and method of construction**

**Figure 29: Section shows the building methods in a traditional building in PS. Nablus City.**

The above picture shows the building of a trade agency, which is well known as “Alwakala”. This photo was taken in the blacksmiths’ market in the Old City in Nablus. This building was established in 1421AD, and it was still working until it was demolished in the last Israeli invasion of Nablus, in 2001. The thickness and composition of its interior walls are clear here. In addition, it can give an idea about the method of construction that has been followed in the building process, consisting of two outer belts – on both sides of the wall – the stones of a width not less than 15–20cm for each layer of stone, and between those two layers of the wall there are stone, gypsum and clay, with a width that is not less than 50cm. The overall thickness of the wall was between 60 and 100cm for interior walls and 80 and 120cm for the exterior walls.

This kind of bed is used especially in summer seasons when the temperature rises to take advantage of air currents within the window, and used by farmers to monitor their fields from inside their house.

**Figure 30: The above photo shows the wall were thick enough to build a bed inside of them.**

b. Rainfall and discharge regimes

These included:

1. Using olive oil in the wall and roof structure.
2. Smoothing their roofs with clay that was made of ash and lime mixed with olive oil.
3. Building domes and slanted surfaces to drain rainwater.
4. Installing drain pipes on the roofs to drain excess water or to collect it in their wells.

c. Ventilation

Some PS traditional houses (type one) have serious ventilation problems. PS farmers prefer to support security factors in their houses more than the ventilation issue (Khasawneh, 2004). Thus, they used to build their homes with tiny windows. Instead of using wide windows they built smaller openings in different shapes above the doors.

In addition, they used to build these small windows in pairs, which are located opposite each other in the walls, in order to work on streaming the air. Moreover they built some ‘secret windows’ to view the outside (Amiry S. , 2003). However, this problem does not exist in type two PS traditional houses, which have plenty of wide windows.

In brief, the new terms and conditions of licensing KGs should encourage designers to be integrated with their local environment and reflect on the culture and heritage of the local people. All this must occur within a new healthy and safe learning environment.

The best way to reflect the Palestinian local heritage and environment is by taking advantage of the traditional pattern of PS houses, which have been used for hundreds of years. Future KG designers should derive inspiration from these traditional patterns, because they derive and inspire their elements such as their colours, forms, lines and raw materials from the spirit of the local environment and surrounding elements of its nature.

Fortunately, nowadays, as a result of re-using a lot of traditional old houses in PS as KGs for the purpose of saving money or because these buildings are usually located close to the city centres and the densely populated residential areas, a lot of current PS KGs could reflect the PS heritage and culture without even intentionally meaning to do that. The problem is they come today with a huge lack of public health and safety issues so that the traditional houses cannot afford them without resorting to extensive maintenance operations or redesigning the interior spaces to achieve the requirements of the quality of space. These extensive maintenance operations may include rehabilitation of the infrastructure of the old buildings and the need to install some new equipment, by which their cost may exceed the ability of many of the current KGs. These steps will be vital in many cases in order to avoid the disadvantages of using such old buildings, such as: high humidity, hard floors, and exposed electrical extensions and wires.

### G) The advantages and disadvantages of using traditional buildings as KGs in PS

## a. Advantages:

1. PS heritage is reflected in their colours, line and design.
2. Arabic calligraphy that has been engraved on the outside of stone walls of these traditional houses, drawings and ornaments, and the Islamic decoration inside these buildings, reflect and document the history and the culture of the local people.
3. Saving the PS traditional houses from demolition and collapse through reconstruction and refurbishment in order to reuse them as KGs will serve the local community.
4. The buildings are in harmony with the environment because the local building materials are derived from it. These traditional houses were established before the spread of the vast movement of trade of construction materials. In addition, the local people used to believe that God, ‘Allah’, provides for each region the best building materials for its houses, which are commensurate with the nature of each region and its problems and needs. There are many poems, folk songs, and popular sayings in the Palestinian heritage and culture that support this trend.
5. They are friendly to the environment (natural materials/recycled materials).
6. Energy is saved for heating because of the thickness of their walls and the materials that were used in the building.
7. No cooling system is needed in the summer season because of the materials that have been used in their structure, which contain earth and lime. In addition, the thick stone walls of 60–180cm work to isolate the outside heat. These walls have been built from multilayers of stones, lime and earth.
8. The majority of traditional houses have a good size back yard with old big trees to provide shade for the courtyard. This not easy to find today in modern houses, especially in the city centre area.

9. The traditional houses are often located in the city centre, next to residential areas or commercial offices.
10. The maintenance of traditional houses to be used as KGs is cheaper than building new KG facilities.

**b. Disadvantages:**

1. High humidity because of the nature of the materials that have been used in construction.
2. The lack of public safety elements:
   a. Active safety systems and features that help to avoid accidents such as fire alarms, installing all electrical socket outlets in a high position, and covering all exposed wires.
   b. Passive safety systems and features that help reduce the effects of an accident, such as emergency exits and fire fighting equipment.
3. The lack of electrical socket outlets.
4. The need for annual maintenance because of the nature of the materials that have been used in construction.
5. Sanitation problems.
6. Vulnerable to collapse in the absence of an appropriate repair by professionals in this field because some of these buildings were built hundreds of years ago.
7. These houses use whitewash, stones and traditional tiles as flooring material, which are too cold in winter for children’s use. Moreover, they have hard surfaces that may cause injuries to children if they fall on them. Stone tiles and stairs become very slippery because walking on them for decades leads to sanding and polishing of their surfaces.
8. The interior windows, such as in bedrooms, kitchens and multi-purpose rooms, are usually high and small unlike the guest rooms and reception, which are wide and tall. This deprives children from viewing the outside environment and reduces the natural light inside these rooms.

9. Some houses from type one have serious ventilation problems as a result of the lack of windows and their small size. However, this problem does not exist in type two PS traditional buildings.

### H) Summary

The main advantages of the current KG facilities in PS that their features focus on are: harmony and compatibility with the surrounding environment; reflecting the local heritage and culture; incorporation of eco-friendly materials for building by using natural raw materials from the local environment; and provision of quick economic solutions for creating early-educational facilities instead of establishing new buildings. On the other hand, the main drawbacks of the current KG buildings focus mainly on the quality of space, which deals with health and safety issues inside these buildings. Therefore, the next section of this study will focus on the features of quality of space in the current KG facilities in PS, because it is believed that the quality of space is the real gap that should be filled in this field. This will occur while retaining green building benefits and taking advantage of the traditional buildings (Figure 31).

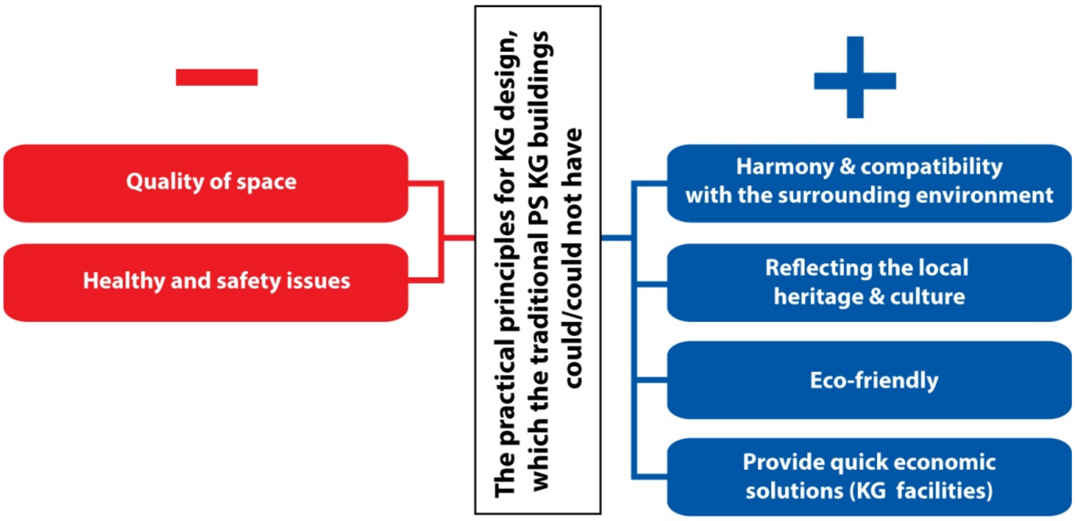


**Figure 31: The practical principles for KG design, which the traditional PS KG buildings could have or miss. The above principles are what could be concluded at this phase of study.**

## 2.1.4. EDUCATION SYSTEM

### 2.1.4.1. Historical background of education development in PS

In this part of the study a review of the historical overview of the role that has been played by successive governments in PS in the education sector will be presented. It is important to understand the way that education has been developed, and the cause of its failure, including the stage of early education. This will occur with a focus on the arrival of the Palestinian National Authority (PNA) and will highlight the most important obstacles encountered.

**A) Education during the Ottoman Rule**

PS was under the Ottoman rule for four centuries. During this long period, the Ottoman Empire, as the rest of the world, had stages of strengths and weaknesses in terms of education. Ottomans were keen on the development of education, having a fear of western methods that may have affected the values of Islamic civilisation. However, these fears did not stop them from connecting with others and sending their students to the west in order to bring back what was useful and avoiding what was considered disadvantageous from western civilisation.

According to Abdullah Shallah (Shallah, 2011) the deterioration of economic conditions such as agriculture, industry and trade has had a direct impact on education. When the Islamic endowments, 'WAQF'[10] , collapsed at the end of the 18$^{th}$ century, education collapsed and many schools closed. This situation continued until the first quarter of the 19$^{th}$ century, when the reform movement began in the Ottoman Empire in 1826 (Shallah, 2011).

a. The phase of power and stability:

   This period was an extension of what was left by the Mamluks from scientific methods and institutions until the end of the 12$^{th}$ century AD. The government was reminded of the traditional ways of education that were located in mosques, Koranic schools and other religious institutions and schools, which depended largely on endowments. This

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[10]**WAQF** (Muslim's charitable endowment)**:** **l**iterally waqf means to stop, contain, or to preserve. In Islamic religion it means a gift of land or property made by a Muslim, intended for religious, educational, or charitable use.

system of education was similar to the open education system. They gave the local people the freedom to choose their own methods to educate their children (Tibawi, 1958).

b. The weakness phase:

The Ottoman governance did not pay attention to education from the early part of the 19th century. The Ottoman government was distracted by wars and political crises, which reflected on the living situation and then education. During this period the Ottoman government applied its own policies on education in PS, which was characterised by not promoting education and limiting it to rich people who could afford education. These ‘aristocratic families’ belonged to a special system that was approved by the government. The ownership of land was limited to a number of families. The result was that 144 families had monopolised 70% ownership of Palestinian lands, while the majority of farmers were exposed to marginalisation at all levels, which included education (Al-Kayyali, The History of Modern Palestine, 1990). In addition, the Ottoman government accepted the sons of their government employees, who were to be used as an educated source to help them to rule this area and serve the Ottoman Empire. For example, they still needed a limited number of local clerks and accountants to help the Ottoman administration to manage and control the affairs of this region. Therefore, in this period, education was limited to the staff of the states, who proved their full loyalty to the state.

c. The phase of reform:

The reform movement of the Ottoman Empire, in all major areas, led to achieving significant improvements in the scientific field, which were applied by Ibrahim Pasha. In 1845, primary schools were established in the Sham Region, which covers Syria, Lebanon, PS and Jordan. The government issued a law called the Principle of Free and Compulsory Education, and in 1847 established the Ministry of Education.

The official government schools in PS were started in 1869 by the Ottoman government (Table 1). The Ottoman government afforded education for all Palestinians by giving them the right to education. This occurred by building more schools and making them inexpensive for ordinary people. The number of government schools in Provincial Jerusalem, Acre and Nablus reached 413 by the end of Ottoman period, in addition to Koranic schools and all traditional methods. The Ottomans built a school in each village that had more than 500 houses and a high school in each city that had at least 1,000 houses (Sabri, 2006).

| | Number of Schools | Number of Students | Number of Teachers |
|---|---|---|---|
| Public Schools | 98 | 8,248 | 234 |
| Private Schools | 37 | 8,531 | 471 |
| Total | 135 | 16,779 | 705 |

**Table 1: Education during the Ottoman rule in PS at the beginning of the 20th century**

**B) Education during the British Mandate**

During the British Mandate period, the education system was divided into four stages. KGs accepted all children from the age of six, elementary schools accepted children from 7 years old (lasting 5 years), upper elementary schools accepted children from age 12 (for 2 years), and finally secondary schools accepted children from age 14 (for 2 years). Vocational education was established in PS for the first time during the British Mandate (Tibawi, 1958).

Within the previous system, the first college (Faculty of Agriculture) was established in 1932, which accepted students from age 14 for two academic years. In addition, the first government business school for Arabs was established in Haifa in 1937, and accepted students from 12 years old for a period of three years. The number of Palestinian students in PS was approximately 93,000, (Table 2) of whom 20% were female (Sabri, 2006).

However, under the British Mandate education was not free or compulsory and it was limited to particular classes of the local society who could afford it for their sons. Abu-Talal Mohanna (68 years old), works in the manufacture of pottery and has sold it since he was ten years old, with his father, who died leaving with Mohanna 'the secret of quality workmanship'. Abu-Talal says:

> "I dreamed a lot that I am at school holding the notebook and pen, and I was writing words that I could not even recognise their symbols until this moment… Before nearly 60 years I went with my father to the school in order to enrol the first grade of primary school. However, the director of the school surprised us when he asked for a large sum of money, which can be only affordable for property owners of the rich and the aristocrats at that time, which prompted my father to say … I am so sorry my son, I am not rich, let us leave education for its people." He also commented: "The difficult economic situation deprived me of the opportunity to study, and forced me to follow my father's footsteps ... I do not blame him at all because he was really the teacher of the profession."
>
> (Palestine Newspaper, 2009)

Abu-Talal reflects on the impact of the economic situation on education in the 1930s and also shows how education was limited to a particular class of society who had enough money to pay.

According to Johnny Alattrash's report, Haj Amin Alhusseiny called for the creation of a 'University of Al-Aqsa Mosque' in response to the establishment of the Hebrew University in 1925 (Yusuf, 1984, p. 4), but the Mandate authorities refused his request. This call was followed by George Shober's initiative to establish an Arab university in Jerusalem in 1947, but this proposal was also unsuccessful. The first step towards the establishment of a Palestinian university was done by the School of Birzeit, which submitted a new course, above the secondary level, in 1951. In 1953 they completed the first class university, which was followed later by a second grade college in 1961. The school name has been changed to become the Faculty of Birzeit. However, the college was not able to develop itself into a university until 1972 (Alattrash, 2009).

In the British Mandate period, the Palestinians tried to establish a university of their own but, as a result of the pressure of the Zionist movement and the opposition of the British Mandate government, this project could not gain the necessary permissions. The British Mandate prevented the establishment of a university in PS on the basis that the establishment of this university would damage the Hebrew Higher Education in the country (Shallah, 2011).

However, an Arab College was established in Jerusalem in 1919 under the British military administration, which came before the British Mandate. This college was called the Men's Teacher Training College until 1926/1927 (Davis, 2003). The Arab College was the highest governmental educational institution in the Arab sector during the period of British rule (Saleh, Palestine: A series of systematic studies on the Palestinian issue, 2002). It was also one of the most important colleges in the region, especially to graduate certificated teachers, until it was destroyed in the 1948 Arab–Israeli War. The British Mandate refused to develop it into a university (Abuhasaneh, 2006) (Al-Kayyali, The History of Modern Palestine, 1985, pp. 37-67).

| Period | Number of Public Schools | Number of Students |
|---|---|---|
| 1940-1941 | 403 | 54,645 |
| 1941-1942 | 404 | 56,558 |
| 1942-1943 | 403 | 58,325 |
| 1943-1944 | 422 | 63,141 |
| 1944-1945 | 478 | 71,662 |
| 1945-1946 | 514 | 81,043 |
| 1946-1947 | 535 | 93,550 |

**Table 2: Education during the British Mandate in PS between 1941 and 1947**

1949–1967: As a result of the 1948 war, the education system in PS was divided into two parts. The first was under the supervision of the Jordanian education system in the West Bank and the second followed the Egyptian regime in the Gaza Strip. The total number of students in schools in the West Bank reached 200,070 in the academic year 1965/1966 (DOS, 1967), whereas student numbers reached 67,189 in the Gaza strip in 1967.

### C) Education under the Israeli military occupation of the Palestinian territories (1967–1994)

According to Omar Shaban (Shaban, 2005), since the first moments of the occupation in 1967, the occupation authorities began applying a set of policies aimed at reducing the effectiveness of the Palestinian education system. These measures continued after the arrival of the PA, but by the following forms and methods:

a. The prevention of granting the necessary permissions to build or refurbish educational institutions that could accommodate the increasing population growth. This situation led to overcrowding in classrooms, which reduced the quality of the learning environment, education and the educational achievement.
b. The closure of educational facilities and institutions for long periods, especially universities. The closed days of the Palestinian universities exceeded 30% of the academic years during the first Intifada between 1987 and 1994.
c. The prevention of both students and teachers from accessing their educational facilities, by closing roads, imposing curfews, and placing 607 military checkpoints in the West Bank.
d. Pressure on the financial centres of education in PS to weaken its ability to develop, preventing their contact with international universities and preventing educational facilities from granting the necessary licences, as well as illegal control of their financial resources.
e. Reduction of the budget allocated to education institutions, impeding the normal development of education by preventing their right to own modern teaching methods.
f. Confiscation of all publications that could have been considered incompatible with Israeli polices of the occupation, which reduced the desire and inclination towards innovation in general.
g. Israel interfered in developing the Palestinian curricula.

**E) Education under the PA (since 1996)**

The early education and pre-schools aimed to build and develop children’s capacity to become active within the community, learn essential life skills, adapt to the standards and values of the community, and communicate with others in their surrounding environment.

The percentage of progress in this vital sector has increased since the PA was formed in 1994. The number of children in KG increased to 73% between 1993/1994 and 1999/2000. The average growth rate was 12.16% annually, which led to an increase in the enrolment rate from 25% to 34.2% of all children in KG during the same period. By 2009/2010 the enrolment rate of all children in KG had increased to reach 38% (see Figure 32).

However, this situation changed after the peace process had stagnated for six years and the provocative visit of Sharon to the Al-Aqsa Mosque: he has since been found "personally responsible"[11] for the massacre in the Sabra and Shatila Palestinian refugee camps in Beirut in 1982. These events led to the outbreak of the second Intifada in September 2000. This in turn led to the military escalation that followed with subsequent incursions, military checkpoints, and the economic and psychological siege on the Palestinian people and its institutions. All previous events have hindered the development process in the KG sector, which led to the decline in progress in the enrolment rate for KG children from 12.16% per year in 1999/2000 to about 1% annually by 2010.

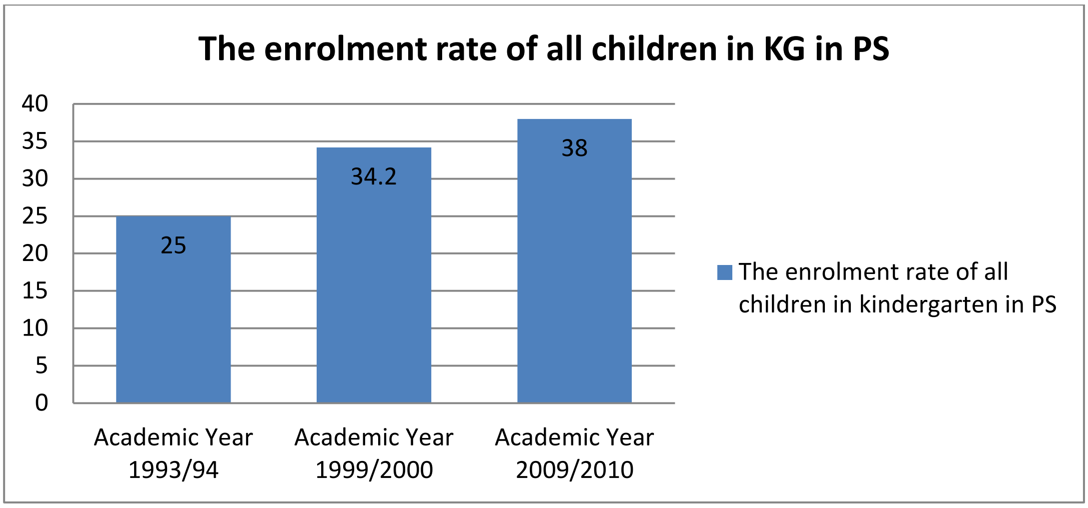



**Figure 32: The enrolment rate of all children in Palestinian KGs between the academic years 1993/43 and 2009/10**

[11] According to the 'Report of the Commission of Inquiry into the events at the refugee camps in Beirut – 8 February 1983', Israel Ministry of Foreign Affairs (8 February 1983).
In addition, The United Nations Security Council condemned the massacre with Resolution 521 (19 September 1982). This condemnation was followed by a 16 December 1982 General Assembly resolution qualifying the massacre as an "act of genocide."

#### 2.1.4.2. Facts and figures about education in PS

This section will review the degree of achievement for educational development at various stages, despite all the obstacles mentioned earlier. This unexpected achievement in spite of all these difficulties indicates the great potential for development in this sector, given the opportunity to build and develop. This section will show what are considered the real causes that led to the uniqueness of the Palestinian education sector. It is believed that some of these difficult circumstances have caused a reverse response; this has led to a remarkable achievement, especially when compared with the surrounding Arab countries, of which many have ingredients for success, such as resources, direct support of the government, and political and social stability, which have unfortunately been missing in the PS territories over decades in this sector. This has made the education sector in PS a unique phenomenon in the Middle East.

The UNRWA commissioner-general, Peter Hansen, declares:

> "Israel works on hindering the education of Palestinians. Besides violating their basic right, it jeopardizes a new generation… Imagine the political fallout if every schoolchild in London had missed a month's schooling last year because teachers could not get to their classes, or if children, heading to and from school, were endangered by tanks, checkpoints, and soldiers – a daily reality in Occupied Palestine, under the harshest conditions facing unimaginable obstacles and disadvantages, impacting education like everything else, affecting a proper environment for teaching and learning."
>
> (Lendman, 2010)

Yet, the United Nations Development Program (UNPD) Report (UNPD, 2009) shows that the percentage of children who are enrolled in the education system and attend school in Occupied PS is 89.1%, which is considered the highest of all Arab states. This number is followed by Libya at 87.5%, Lebanon at 87.1% and Kuwait at 86.8%. The overall Arab average is only 66.2%.

Furthermore, a PCBS report (PCBS, 2008) and the UNPD Report in 2009 point to the illiteracy rate in PS in 2006 as being only 5.2% of the population. This means that PS could achieve the top rank among Arab countries, despite all previous difficulties, and that has happened as a direct/indirect result of being under 44 years of military occupation. According to the UNPD (UNPD, 2009, pp. 171-174) report, the illiteracy rate in the 21-nation Arab League is currently estimated at 29.8%, whereas the global rate was 16.1% in 2007. This means approximately 113.8 million Arab adults could not read and write by 2007.

It should be noted that all previous figures reflect an increase of quantity (such as the amount of enrolment) and they do not necessarily reflect any improvement in the quality of the Palestinian Education System. However, it at least reflects the importance of education among both the Palestinian society and the PA.

- **The motivated phenomenon**

According to Fahmi Odeh (Odeh F. , 2003) (Zabboun, 2010) there are some general factors that are considered the main reasons that lead to the emergence of this phenomenon in the Palestinian Society, which back mostly to the following reasons:

A) Education as a means to resist occupation
For over six decades, over four being under occupation, Israel has followed policies against millions of Palestinians, especially children, to cripple new generations physically and emotionally, to crush their spirit to resist, to harden a ruthless colonial agenda in violation of fundamental international humanitarian law with respect to basic human freedoms, self-determination, and the right of people to live freely on their own land in peace. It may be surprising that these are the same factors that led to the high proportion of education among Palestinians, and also to the higher turnout in all sectors of higher education. The Israeli policy goals to destroy education and deprive the Palestinians' right to education could have directly contributed, unwittingly, to the spread of education among all segments of society. Education is considered a kind of challenge that is needed in order to stand against the difficulties. "Everything forbidden is desirable", especially when this prevention comes from those who try not only to confiscate your home and land but also your future.

Therefore, the more the practices of occupation aim to combat education and its spread, the more this leads to a greater desire and determination to get it in various ways, whatever the cost.

B) Education helps break cycle of poverty among PS refugees

Palestinians consider education a vital issue for protection and sustainability. After the wars of 1948 and 1967, Israel occupied PS and created the refugee problem inside PS and outside it where refugees live in camps in Lebanon, Syria and Jordan. Education was the only way for them to break the cycle of poverty, especially after the Israeli government confiscated the lands that they used to depend on as a primary source for living. Therefore, education has become the farmers' way to improve their lives and the quality of their children's lives after losing their olive and orange groves. Moreover, it was the only way for the children of ordinary traders, who had also lost all their businesses and their shops (the source of their income), to live with dignity outside PS, while the people who still live inside the occupied areas consider education the more powerful weapon. It is believed that education will enhance their steadfastness in the battle towards the road of freedom and help them gain access to an independent state (Al-Rantesy, 2009).

C) Limited choices in refugee camps

In order to understand the size of this problem, according to the UN report in 2010 the population of Palestinian refugees who live outside PS (Israel and the Palestinian territories) is approximately 4.8 million[12] around the world (UNRWA, 2009). In order to understand the kind of life in these camps (after about 60 years of development, if there is any), Lebanon will be used as an example. Lebanon has been chosen because at present there are 12 official refugee camps (Shafie, 2007). Palestinian refugees face bias in employment and a lack of access to adequate education and housing.

[12] Based on the UNRWA definition, the number of Palestine refugees has grown from 711,000–914,000 in 1948 (UN, 1951) (CEPS, 2003) to 4.8 million registered with the UN by 2009 (UNRWA, 2009). However, UNRWA reports that the number of refugees in 1950 was 957,000 and PCBS estimates 859,000 (PCBS, 2008).

In addition, Palestinian refugees are prevented from owning real estate in Lebanon (Chaaban, et al., 2010, pp. 14-15). In some houses, there are families of 10 members, who have to share a single room with unacceptable levels of habitability (Amnesty International, 2007). Palestinian refugees have had very limited choices and they have to live in jammed camps, which are suffering from a lack of basic infrastructure. Although the population of refugees in these camps has increased four times, the size of these camps has barely changed since 1948, because refugee camp land has very restrictive laws that prevent any kind of expansion. As a direct result of this, the alleyways in these camps have become even narrower and darker, and their homes do not receive direct sunlight throughout the year. In addition, the pervasive smells of rubbish and sewage become common in such areas (Amnesty International, 2007). The ordinary citizen has realised that education is the only way to escape from this miserable situation. Palestinian refugees are prevented, by law, to own a private business, or trade outlets, buy property and land or even apply for government work in many places, such as Lebanon. Therefore, higher education was the only way for a lot of them to escape from poverty and the pursuit of hope to live a decent life outside these camps.

D) Gaining respect and self-realisation

Ordinary Palestinians, especially farmers, were aware from a very early age that education is the only method that can be used to 'win' a government job and increase their chance of getting permanent jobs in government, which was highly desirable (Al-Kayyali, The History of Modern Palestine, 1990, p. 103). In addition, to be a teacher, officer, engineer or a doctor was a dream because these disciplines had been few among poor villages, especially those located far away from urban centres. Moreover, these careers are appreciated and respected in Palestinian society. It is understood that education can shift them from a lower class to a higher class among their close communities and societies (Al-Kayyali, The History of Modern Palestine, 1990). In addition, the vital role that both competition and jealousy have played in closed or small farming communities in PS towards seeking a higher education at that time cannot be denied (20$^{th}$ century). Competition in small communities was in almost everything, starting with the amount of crops harvested and the speed of collecting, the collection of money, social status, the number of children, the extent of their education or the amount of studying and memorising of the Quran (the Islamic holy book). Education was one of the most important areas of competition, especially in small farming communities in villages, where parents were very proud that their children could achieve a better education and they would to do all that they could to achieve this goal, especially when some individuals were not able to be superior in other fields such as owning land, money or social position.

Saeed and Muhammad Abuhannoud confirmed this motivation:

> "In the middle of the 1920s, our village had their first official public school and there was a group of teachers who came to work here. Those teachers were much respected among all villagers. In the 1940s, our parents were fans of those teachers who were wearing beautiful suits and looked like aristocrats (high class). Moreover, they were considered very rich because they always had cash to pay with as a result of receiving a monthly salary from the local government, whereas as is well known, the majority of farmers used to have cash only after selling the crops, once or twice a year. Their father was not rich and just had the basic education, as did the majority of farmers, but he believed in education and also their mother was jealous of their neighbours (especially cousins) who enrolled in the school. Therefore, they decided to enrol all their children of both genders (6 members) to schools, which was at that time a big decision for a bigger dream. Although we were not poor at all and our level of living was considered good in that period, the cost of schools was still considered very high for us and over the budget. Therefore, my parents decided to sell (for the richer farmers in the village) one piece of land at the beginning of every academic year to pay school fees and buy school needs (stationery and uniforms)."
>
> (Abuhannoud M. N., 2011)

Despite the importance of the land for ordinary Palestinian farmers at the time, because land was considered the only source of income for most of them, many of them did not object to selling to the richer farmers in the village or the Palestinians landlords for the purpose of education, which indicates their awareness of the importance of education in this era. In addition, it could point to the high cost of education at that time (for more information, return to Pages 77-78).

E) Social factors

The Israeli occupation focused, in the 1948 war, on attacking the Palestinian coasts, which included the most vibrant, commercial cities and the main ports of PS such as Haifa, Jaffa, Acre and Ashdod. Some of these were located in the Jewish part in the UN division, although the vast majority of all cities' populations were Palestinians. This is what led to the occurrence of several massacres among the Palestinian population, which were aimed at expelling them from these cities and pushing them towards displacement in the shortest time possible (see Appendix 2). As a result of these massacres, hundreds of thousands of Palestinians had to escape to the far Palestinian cities in the mountains away from the coast, or to neighbouring countries such as Lebanon or Syria (see Appendix 2), bringing with them, as with any fugitive from war, little or nothing at all (Morris, 1987).

According to Fehmi Odeh (Odeh F. , 2003), the people of the coast are characterised by several facets, differing from the people of the mountains in PS, mainly including the following:

1. In that period the inhabitants of the coast had a more advanced culture compared with the people of the mountains as a result of active trade exchange movements in the Palestinian ports, ease of travel, and communication with other diverse cultures and civilisations. The fact that these cities were home to a number of multinational companies and foreign institutions led to a high cultural level, especially when compared to more closed communities in the mountains (central, eastern and north of PS) or in the desert in the south of PS.
2. Their average income was much better than the majority of cities located in the mountains in the West Bank. The coastal towns are rich and have multiple income sources, which led to an increase in the average income of their inhabitants and raised the standard of living in that period. As evidence of this, these ports were the main destination for a lot of people from all over PS in order to work or trade, even from neighbouring countries where they were coming to work in the orange fields on the coast of Jaffa in the picking season. All of this led to the existence of an upper class and an upper-middle class, who had enough

resources to educate their children; they could even handle the expense of sending them abroad to gain a better education. This was very important, especially in the late Ottoman period, when the interest in education in PS become very low and also became confined to only the rich or the sons of workers in the Ottoman government in the PS state.

Therefore, when those 'educated refugees' moved to the West Bank and the surrounding countries that could not easily gain education for many reasons for long periods (Pages 77-78), they helped in enhancing the education system in these regions; especially since a lot of them did not have any source of living after losing all that they owned in the 1948 war. In addition, the majority of refugees did not work the earth as farmers in that era in the mountain areas; they worked in teaching and made it their career at least until they could improve their life. Then, some of them worked in trade or stayed in teaching. It is believed that those refugees later played a vital role in attracting attention to the importance of education and dissemination of cultural awareness among ordinary people. It should be pointed out that this study deals with a wide range of people, resulting from the mixing of both the people of the coast (the displaced/refugees) and the people of the mountains (the other PS populations).

#### 2.1.5.3. The educational structure in PS (Background)

The objective of this part of the study is to show the organisational structure and the administrative system of education in PS. It is essential to identify its different stages in order to create a complete picture of and comprehensive information about the current structure, on which the future laws and proposed legislation in licensed KGs in this study will be based, to serve a specific stage of its educational sector.

Then, this study will address the types of educational buildings of KG which currently exist and are used. This study will be concerned with all those kind of buildings in terms of the nature of construction and ownership, in order to show the effects that they could have on both child health and safety. Moreover, it will demonstrate their impact on the new legislation of licensing KG facilities. This part of the study will work on presenting the degree of response which is expected from each type of building owner (owned/rented), and also the future possibility of each one of them to interact with these laws and to contribute to their implementation and achieve the desired goals.

### A) Co-sponsors of the education

In PS there are four sectors that have the responsibility of overseeing education. The first one is UNRWA, which serves Palestinian refugees' children in Palestinian refugee camps in the Palestinian territories, covering six years of basic education and two years of secondary school from age six to fifteen years old. After that their students have to join the local government schools or private schools if they wish to complete their studies. This category constituted 24% of school students in 2001 and 23.3% in 2007 (see Figure 33). The second group of schools is run by MOHE, which is part of the PA. These sorts of schools are considered public schools/government schools, including the majority of school students (constituted of about 62% in 2001 and 70% in 2007). These schools service all students from age six up to eighteen. The third group is the private educational facilities, which includes private schools and pre-schools. This sector is run by private institutions, charities or religious communities. Some of them aim, as in any successful business, to gain profits, whereas educational facilities that are run by charities or religious communities are usually considered non-profit facilities. Although this kind of investment covers all ages from a few days at nursery school until university in PS, it only included 14% of school students in 2001 and 6.7% in 2007 (Essouso, 2001) (MOP, 2009). The last category, which includes higher education such as colleges and universities, is run by their own special internal administration teams with supervision and coordination with MOHE.

### B) Stages of education and age groups

The Ministry of Education runs an education system comprising 12 school years starting from the first elementary class and ending with the twelfth grade. The education stage includes both basic education and secondary education. In PS, the basic education stage at elementary schools, which is the first compulsory education stage, covers classes 1 to 10, and accommodates pupils aged between six and sixteen. Secondary education covers classes 11 and 12 (non-compulsory). The age of those enrolled in these two tracks of secondary education ranges between 16 and 18 (Mahshi, 2000). Higher education includes high colleges and universities for those aged 18 and above (non-compulsory). The academic year begins on 15 September and ends on 30 June. The duration of the academic year is approximately nine months, which includes all schools, even pre-schools.

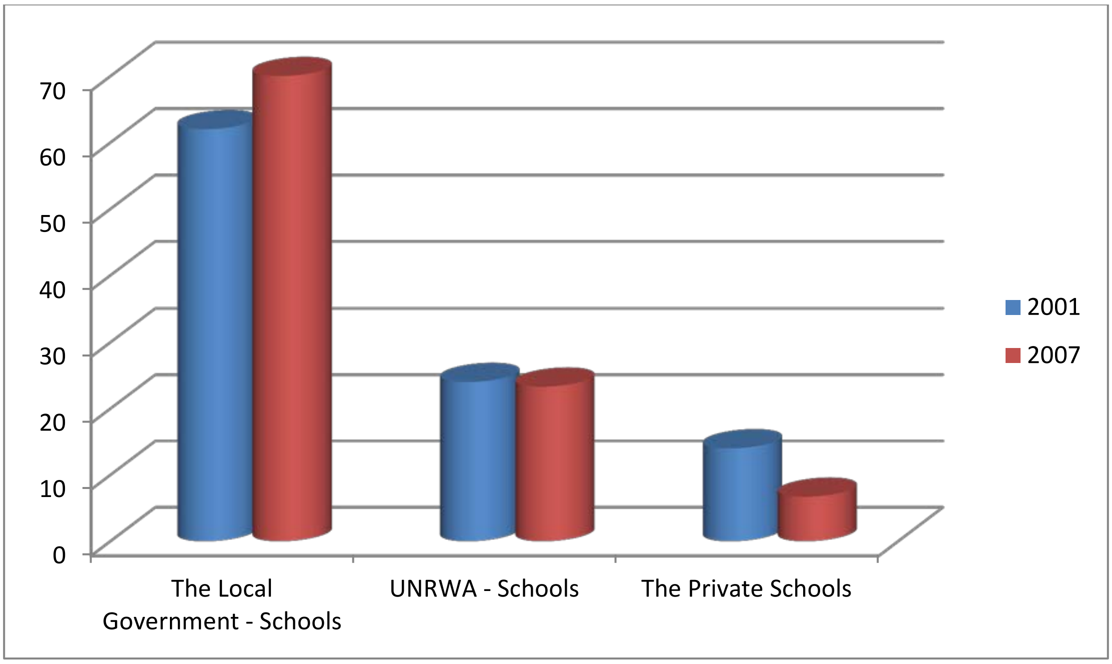



**Figure 33: Participation rate of the co-sponsors of education in Palestinian schools in 2001 (Essouso, 2001) and 2007 (MOP, 2009).**

### C) The types of KG buildings, in terms of ownership (owned/rented) and their impact on the development of KG environment

It has been noticed that the majority of KGs in PS have originally been built to serve different goals, then they have been modified or just refurbished to be used as KGs. It is very rare to find a building that has been originally designed and built specially to be used as a KG.

There seems to be no problem in that. However, investors tend to target very old houses (traditional houses) with a back yard that is often located in the city centre, next to residential areas or commercial offices. In some cases the investors use their own traditional houses or their old homes as a KG building. These sorts of houses usually have a lot of problems that may badly affect children's health and safety. For example, the old style of these houses was built by using earth, lime, whitewash and stones, thereby raising the humidity and the need for annual maintenance works to face the winter season and heavy rain. The high rate of humidity could have a negative impact on children's health and may cause asthma (Bagley, 2009). In addition, these houses use whitewash, stones and traditional tiles as flooring material and are too cold in winter for children's use. Moreover, they have hard surfaces that may cause injuries for children if they fall on them, and stone tiles become very slippery because walking on them for decades has led to sanding and polishing of their surfaces.

Because of investors' focus on keeping the cost to the minimum, they usually keep the same design, the same floorings and doors, use cheap equipment in lighting and heating systems, and also use cheap materials such as in painting and flooring. Because the majority of KG buildings in PS used to be rented[13] (MOHE, 2010), they could not change or modify the structure without getting a written permit. They tend not to install any good equipment or furniture that could not be taken with them if they have to leave the building if the landlord of the building refuses to extend their rent contract. They know they may never recover the cost of improving and developing the KG environment. Thus, they do nothing or just do the minimum, i.e. what they consider 'necessary' works, to continue. As a result of interviews and meetings that have been undertaken with KG owners, it has been noted that this situation could be much better if the KG building was owned by investors, whether by building it or buying it. Investors in this case have full authority (after obtaining the necessary building permits) to modify the building. They are also more likely to spend significant money on the refurbishment and development of their buildings, especially if they could reap good profits from running the business over the next few years. It is believed that they could be also more receptive to others in listening to advice and guidance from experts, if they are aware and feel the importance of the development of the learning environment on pupils' behaviour and outcomes, and taking into account the financial cost factor.

[13] By 2007/2008 the majority of KGs become owned, approx. 35.53% rented; 59.97% of KGs are owned and about 4.5% mixed in the West Bank (see Table 3) (MOHE, 2010).

| Owned + Rented | | | | Rented | | | | Owned | | | | Directorate |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total | Coe | Female | Male | Total | Coe[14] | Female | Male | Total | Coe | Female | Male | |
| 32 | 32 | 0 | 0 | 253 | 251 | 2 | 0 | 427 | 418 | 6 | 3 | Overall WB |
| 4 | 4 | 0 | 0 | 17 | 17 | 0 | 0 | 38 | 38 | 0 | 0 | Jenin |
| 0 | 0 | 0 | 0 | 7 | 7 | 0 | 0 | 23 | 23 | 0 | 0 | Nablus |
| 3 | 3 | 0 | 0 | 41 | 41 | 0 | 0 | 37 | 37 | 0 | 0 | South Nablus |
| 1 | 1 | 0 | 0 | 4 | 4 | 0 | 0 | 21 | 21 | 0 | 0 | Salfeet |
| 0 | 0 | 0 | 0 | 11 | 11 | 0 | 0 | 25 | 25 | 0 | 0 | Tulkarm |
| 3 | 3 | 0 | 0 | 8 | 8 | 0 | 0 | 16 | 16 | 0 | 0 | Qalqilya |
| 3 | 3 | 0 | 0 | 17 | 17 | 0 | 0 | 54 | 53 | 1 | 0 | Ramallah |
| 4 | 4 | 0 | 0 | 14 | 14 | 0 | 0 | 24 | 23 | 1 | 0 | Jerusalem Suburbs |
| 2 | 2 | 0 | 0 | 17 | 16 | 1 | 0 | 23 | 19 | 2 | 2 | Jerusalem |
| 1 | 1 | 0 | 0 | 12 | 12 | 0 | 0 | 38 | 35 | 2 | 1 | Bethlehem |
| 0 | 0 | 0 | 0 | 4 | 4 | 0 | 0 | 9 | 9 | 0 | 0 | Jericho |
| 7 | 7 | 0 | 0 | 42 | 41 | 1 | 0 | 56 | 56 | 0 | 0 | Hebron & the North |
| 2 | 2 | 0 | 0 | 28 | 28 | 0 | 0 | 41 | 41 | 0 | 0 | South Hebron |
| 2 | 2 | 0 | 0 | 16 | 16 | 0 | 0 | 15 | 15 | 0 | 0 | Qabatya |
| 0 | 0 | 0 | 0 | 15 | 15 | 0 | 0 | 7 | 7 | 0 | 0 | Tubas |

**Table 3: Distribution of KGs by directorate and ownership and gender in the West Bank for the school year 2007/2008 (MOHE, 2010).**

### D) The Palestinian KGs under PA

In this section, the impact of the lack of government support – especially financial support – and the limited role played by the ministry towards the KG, which is not commensurate with the importance of such an important category of educational facilities, will be illustrated. In addition, the study will clarify the impact of each on the quality of service that could be provided to children in these facilities, especially in light of the current economic situation.

[14] Coe =Coeducation

a. Public education

The Ministry of Education was established in 1996 within two years of forming the PA. In 2002 its name changed after being integrated with the Ministry of Higher Education into one ministry that today is called the MOHE. It has a duty to supervise 1.1 million pupils and more than 30,000 teachers. In addition, the main aim of MOHE is to improve the education sector. MOHE oversees public education in government schools (public education), the schools of the refugee agency UNRWA, and the private schools sector that includes the KGs, as well as supervising the Ministry of Higher Education for the Palestinian colleges and universities (MOHE, 2010).

b. The role of government towards KG

According to Dr Ali Khalifa (Khalifa, 2010), who is the director general of MOHE, the Ministry of Education has the responsibility to licence and supervise KGs (non-compulsory). Palestinian KGs are divided into two stages: KG1 ‘Bostan’ and KG2 ‘Rawda’. KG1 includes children from age 3 years and 8 months to 4 years and 8 months, whereas KG2 includes children aged from 4 years until 5 years and 5 months.

On the other hand, since 2002 the Ministry of Social Affairs (MOSA) in PS has supervised nursery schools. In general, nursery schools (non-compulsory) include children aged from a few days to under 4 years old. The pre-schools, which include both nursery schools and KGs, have a different situation from elementary schools, high schools and the higher schools in the Palestinian Education System for the reasons listed in the next table (Table 4).

| | Nursery Sch. | Kindergartens | | Elementary Sch. (Basic Education) | Secondary education | Higher Education |
|---|---|---|---|---|---|---|
| | | KG1 'Bostan' | KG2 'Rawda' | | | |
| Pupil/student ages | Few days<3 years and 8 months | In general 4<6 | | 5 years and 5 months<16 | 16<18 years | ≥18 |
| | | 3 years and 8 months<4 years and 4 months | 4 years <5 years and 5 months | | | |
| Compulsory | X | X | X | √ | X | X |
| MOHE | Supervise | Supervise | Supervise | Run | Run | Supervise/Run |
| MOSA | Supervise | X | X | X | X | X |
| Tuition fees | Non-Funded | Non-Funded | Non-Funded | Full Funded | Full Funded | Partly Supported |
| Edu-Building | Non-Funded | Non-Funded | Non-Funded | Full Funded | Full Funded | Full Funded NGOs, International Society, PA |

**Table 4: The educational system in PS, group age, compulsory or non-compulsory, tuition fees, and the type of management and supervision**

From the above table it can be seen that not all kinds of pre-schools are included in the financial support from local government that elementary and secondary school have. The Palestinian ministries take a different view towards these kinds of educational facilities, and grant them only the necessary licences and indirect supervision, and provide advice (MOSA, 2010). Not only do they not forward any official sort of financial support to these facilities, but pre-schools have to pay annual taxes and fees to the government, which is a result of them being considered a kind of private business with the exception of charities and pre-schools that are run directly by the local councils (FLO, 2004).

As a result of this system, there will be no establishment of KGs under the full responsibility of the local government. This has led to the majority of KGs having been established and run as private projects in this region by private companies or institutions, whose main aim is to earn fast profits. However, there are very few exceptions for KGs that are established by local associations or international non-profit organisations that aim to serve local communities, such as NGOs. These KGs are usually run by charities or directly by the local councils.

In addition, MOHE does not interfere in the KG in many fields such as selecting pupils' uniforms, tuition fees or the mechanism of registration (Khalifa, 2010).

| | West Bank | Gaza | Total |
|---|---|---|---|
| Females | 48.9% | 39.7% | 45.2% |
| Males | 47.4% | 35.9% | 42.9% |
| Total | 48.2% | 37.8% | 44.0% |

**Table 5: The percentage of new entrants in the first elementary class who participated in any of the programmes organised for early childhood development in the academic year 1998/1999 (Mahshi, 2000).**

c. KG management in PS and its impact on education

It should be pointed out that almost all Palestinian KGs in the West Bank are established and managed by families (most of them with limited resources), private institutions and companies, or charities. There is no doubt that the institutions or private companies, which manage and run such businesses, aim to earn a quick profit. The problem is that this quick profit will be earned from the potential customers, the majority of whose incomes fall below the poverty line, and who struggle to cover minimal basic needs for survival.

## 2.2. ENVIRONMENTAL PSYCHOLOGY

Children pass through three different stages in their lives during this period, namely: early childhood, middle childhood and late childhood. Each stage has special needs that should be covered in order to allow children to develop good mental and physical health. Moreover, the next stages in children's lives: youth, adulthood and old age, depend to a great extent on the attention and care that children have received during early childhood. There is no doubt that early childhood is considered one of the most important stages, when children need practice to integrate them into the societies where they are located. This is a vital issue that will in the future enable children to play their role among their families and colleagues. This makes them active and effective members in their social surroundings. In addition, children need not only to be provided with knowledge, but also to be loved and understood. They also need to be dealt with as human beings at the first rank (Bedeer, The Integrated Care with Children, 2005).

This understood, care, love and attention, as well as the provision of children at the early stage with the necessary knowledge, would develop them to be committed towards themselves and then towards others. This could lead them to be aware of their rights and responsibilities within an encouraging environment. The encouraging environment boosts them to achieve acceptable behaviours and good skills, while they are developing the self-awareness to avoid unacceptable deeds. Family and educational institutions are considered the most important environments to create a positive atmosphere where children will be shaped. There they learn to develop positive behaviours (Bedeer, The Problems of Kindergartens Children and their Treatment Methods, 2007).

### 2.2.1. Children’s common problems in kindergarten

According to Sami Melham (Melham, 2002), if children live in self-conflict, contrast and violence, all this could appear in their future behaviours. This could be shown as anger, rebellion and disobedience. Moreover, they could suffer from a lack of confidence as well as a lot of problems besides the two mental and physical levels (Abed-Almomen, 1986) (Nashwany, 1980). The problems and difficulties occurring to children at this stage are:

1. Knowledge and mental difficulties, presented in lack of concentration and attention.
2. Social problems, presented in many forms, such as non-cooperation, loneliness, bashfulness and suffering from a lack of sympathy with others.
3. Emotional problems, presented in children's behaviours such as anger and fear, which appear at the beginning as screaming. This might lead to aggressive and revengeful behaviours.
4. Physical and motion problems.
5. Children appearing confused, moving without aim or clear reason. They could suffer from tension or looseness in muscles leading to being incapable of moving under some situations.
6. Using unacceptable behaviours in order to express themselves. The child could use screaming or hurting others to show that he is here, or for the sake of drawing attention.

It is believed that interior design can play a significant role to help both educators and families within kindergartens at this stage. It deals with problems such associal problems, unacceptable behaviour, physical and motion problems. The purpose is to cure them or at least work on reducing their impact on children and their colleagues.

### 2.2.2. Learning at kindergartens

Learning means changing. It also assists learners to earn skills, knowledge and experiences, which could help learners to change themselves towards the best by having new attitude or view. These stands can help learners to adapt to their environment (Mohammed & Amer, 2008, p. 13). Furthermore, instruction is identified by Course Ware and Gorey (1967, p 6) with a group of reactions and integration between relationships, environment and learner response. This should be evaluated and judged on them by the final analysis via their findings. These results will be instructing towards the learner (Amer & Mohammed, 2007, p. 83).

Learning can be active, enjoyable and interesting at the same time. This is considered a controversial issue for a lot of older people, especially when they remember their past. In their days, learning used to be just hard work. Although it is believed that learning might still be hard work for a lot of pupils, it is becoming at the same time more active, interesting and enjoyable for both educators and learners. Even when children make mistakes while they are learning, they still can enjoy and learn from their mistakes.

Learning is an endless process. Pupils still improve even when they become young or adults because the learning process still continues. A person's realisation of things in their atmosphere will still change and improve (Jaber A. , 1999).

Learning is an individual, collective and synergistic process. It is easy to notice that when children or even adults pass the same experiments and have the same experiences within a kindergarten, school or job, each one of them learn with a different way and shape. This reflects having a different character and an individual previous experience. Each one could build and add in his/her life. It is easy to understand why learning could be considered as a collective and synergistic process. Certain aspects of the learning process should be done within a group, when the sharing of others could boost the learning practices (Mohammed & Amer, 2008).

Designers should support educators to reach their educational aims on both levels: as groups and individuals. The target should be developing children's skills, behaviours and knowledge. It is believed that this could occur by creating an enjoyable, interesting and reactive learning environment that covers children's needs. Although children share needs and objectives, designers must take into account the distinct personalities and differences of children's natures while they are working on creating or redesigning an inspiring kindergarten environment that can be supportive on a social level.

### 2.2.3. Learning conditions

Cognitive development 'learning' is not an automatic process. It does not occur by accident or as a result of a random behaviour. It needs to be worked on to be achieved. Moreover, learners should have these main conditions to complete their role in this process:

a) Motivation, which is considered the main condition to achieve success.
b) Enhancement and reward, which could guarantee the continuity of learning and repetition as it tries to reach learning aims. Rewarding learners can encourage them to improve or repeat positive behaviours.
c) Exercises, as learners cannot reach all aims at the same time. Thus, educators must divide learning activities into different parts to facilitate the learning process. Dividing the exercise into parts of the subject that are aimed to be learned can ease tasks. It also comforts both teachers and learners. This act can keep boredom and wariness, or fears of uncompleted tasks, far away from learners.
d) The right start, which is the first step toward success. If learners are taught how to write their first letters in the right way by moving their fingers and hands together to write well, this could lead them to write words in the right way later.
e) Continuous assessment, revision and evaluation, simply because it can help educators to discover gaps and mistakes in order to work on changing plans or methods, which have been already followed, to achieve aims.
f) Guidance, to redirect learners' behaviours. It can help learners to achieve positive target changes. In addition, through guidance, learning targets could be reached with less time and effort.
g) Last but not least, it is believed that learning cannot occur without social interaction. Learning is considered a group of interactive processes that must be shared between at least two people (the learner and guide). Social interaction in all shapes can help learners to reach learning aims. It does not matter if that happens within classroom, kindergarten or school, as long as the personnel can get positive behaviours (Mohammed & Amer, 2008, pp. 15-17).

h) In brief, because learning is not an automatic process, architects and designers must support educators to reach this aim. They must start with learning conditions as a base to deal with kindergarten spaces. Kindergarten spaces must be addressed to serve the educational process. Therefore, they must work with educators and parents before planning the kindergarten and also during the various stages of work. This could ensure the coverage of learning conditions, which contributes to addressing the space in the best way to serve all parties (pupils, parents, educators and curriculum). In addition, they must focus on creating a social environment that encourages children as well as parents to interact with the kindergarten environment. As a result of this awareness, the importance of these points of educational objectives could be achieved.

### 2.2.4. Children’s learning environment

Educators have started using this concept since they discovered the environmental impact, which included human and material resources, on children’s learning (Alassi, 1994). Moreover, the interest in the field of children's learning environment has increased, touching on the direct effect of scientific and technological developments on facilitating the child’s education. This has led to an interest of modern education systems in organising the child’s learning environment. It plays a vital role in developing skills for facing daily problems (Fahmi, 2007).

A child’s learning environment cares about the capabilities of children, and their tendencies. It also takes into account the individual differences among them. This science is interest in studying the interaction between the component of human and physical environment and their impact on increasing the learners’ motivation to learn, cognitive development of concepts and skills that children would use in their daily life as much as possible. Therefore, a child’s learning environment could be identified as a set of circumstances and external human and physical factors. They surround the child and have an effect on the speed and effectiveness of their learning processes (Fahmi, 2007, p. 13). Therefore, one of the most important challenges kindergartens face today is how they should create and prepare for a learning environment. These learning environments should be prepared to be suitable for all children in their educational institutions to reach the development of concepts and skills, while keeping in mind the individual differences (Nashif, 1997, pp. 11-12).

The modern life style and technology, created to ease people's lives, might complicate their lives or even make it more difficult to be enjoyed. Modern life could impact negatively on young children and adults. Scientific and technological developments have a significant effect on children's learning environments. However, the designers of learning environments have the responsibility for avoiding drawbacks. They should focus on the benefits of this modern technology, while keeping an eye on saving the environment. Furthermore, designers must take into account the individual differences while they are developing children's learning environments.

### 2.2.5. The importance of playing environment on child's developmental psychology

Children’s toys and games are considered vital factors in building their characteristics .Their tendency to move is instinctive behaviour. Therefore, playing is an important automatic activity. It is as significant as air and water for children’s lives (Ahmed & Kujak, 1983). Play is children’s way of expressing themselves and discovering their surrounding environment. Moreover, the degree of children’s learning depends largely on the success of the play selection tools and methods of use (Ali, 1998).

According to Najlaa Asiry, who is a specialist in Mental Health Counselling, each stage of children’s development has its toys and games that are compatible with children’s needs, inclinations and abilities. Choosing the appropriate games for children depends on the circumstances of the social, environmental and cultural conditions surrounding the children themselves. Playing is considered to be the primary way to prepare children for adult roles. There is no doubt that the correct practices of playing can strengthen children’s bodies, stimulate their minds, and reduce the daily pressure on children. It is also considered an outlet for emotions and excess energies in the body to be kept in balance. In addition, playing encourages children in planning, discipline, cooperation and working to achieve goals. At the social level, playing can lead to learning respect for the system of law, recognising others' rights, strengthening social connections and urging cooperation (Ebeed, 2007, pp. 11-14).

Children can learn a lot of moral and social concepts by playing. They can learn the meaning of right and wrong, give-and-take, good sportsmanship, honesty and self-control. Moreover, by playing, talents could be detected early in children, such as the talent for drawing.

The parent must share with kindergartens the responsibility for educating their child through playing. It should be pointed out that mothers' play with their children has a significant impact on their children's development at a psychological and educational level (Helmy, 1998). Hence it is clear that mothers play a greater role than just feeding their children and meeting their physical needs (Hawasheem, 1990) (Ebraheem, 1998) (Fahmi, 2007).
Children should try to do everything new by themselves as long as it is completely safe. They can learn from each attempt whether this attempt was successful or not because children learn more effectively from their personal experiences and mistakes (Areff, 1982) (Zaitoun, 1999).

Children like to act like adults by wearing their clothes, shoes and accessories. This is considered a kind of imitation of the adult world. In addition, they like to act like doctors, teachers or their parents. This might boost their imagination at this age. Parents and educators should encourage children to play by providing them with appropriate games and toys for their ages. These toys must not be too expensive to achieve their goals. Water, sand, soft boxes and non-sharp cubes as well as coloured balls could be just as valuable as expensive toys. They will learn by their success and mistakes. Parents and teachers must just guide children, not take control of them.

According to Eric Kendson, a professor at Stanford University in the School of Medicine, games that have specific educational aims that encourage developing skills can leave a temporary effect on children's brains. These effects could be adopted in order to be developed later when they become older. Teachers can integrate and mix between playing and learning without children take attention or feel with this. While children play football they can learn accounting by recording goals for each team. Hence, games can play a vital and superlative role in children's education system while they are playing and having fun simultaneously (Albabedy, 1990).

### 2.2.6. Educational learning games for children

It is clear that learning through play can be an important strategy in the education of kindergartners. It is also appropriate for integration of different subjects, which may help a child to interact with its environment. Studies have shown the efficiency of using playing strategies in learning life skills, which are necessary for children at this age. Moreover, there are many reasons that lead educators to use educational learning games which could be useful for both teachers and learners (children) (Fahmi, 2007, pp. 117-118). The reasons for the importance of games are as follows:

a) Games could give children a chance to simulate and interact with some real situations, which are similar to their environment.
b) Games could help children to achieve positive social interaction.
c) Games provide teachers with diagnostic information about the capabilities of children. They might thus help children to correct their mistakes or fill in gaps in the learning environment.
d) Games could remove children's fears of learning.
e) Games have two important factors; excitement and thrill. At the same time, they must be simple and easy.

Teachers at kindergartens should have enough knowledge and experience of using these educational learning games to explain the game rules to their pupils and what they should do, outline the aim of the game and the distribution of roles to play, and give them an example (Kheerallah, 1990).

### 2.2.7. The impact of the environment on children's behaviour and development

There are four major aspects of a child's development: mental growth, physical growth, social growth and emotional growth. These aspects are integrated and consecutive. They aim to complete maturity and continuity. In other words, they do not happen suddenly, but they grow and develop in sequential steps (Fahmi, 2007, pp. 21-25).

It should be noted that the various aspects of growth are affected by several variables, of which the most important are:

1. Genetics.
2. The quality of food, which the child is dependent on during growth (Physical development).
3. The social and cultural environments which surround children and affect the nature of their growth.

Who track children's growth knows that children become able to deal with their daily problems and work on solving them. This occurs when children can understand their daily problems and then work on analysing them to outline the main factors that affect them. After that, a child would work on assuming solutions, which could help him in his issue, before testing them to achieve success by solving the problems. These inherited mental capabilities are a result of inherited fungal preparations and environmental stimulus for these preparations. Children have differences in their mental abilities .Thus, activities and experiences must be diverse and sensitive to the individual differences in mental abilities.

Regarding physical development, a child contacts their surrounding by using their senses to recognize and adapt to their environment, whether coastal, desert, agricultural or urban. In addition, developing children's bodies through sport activities and play could develop children's muscles, which plays an essential role in their health and avoiding sickness. Social growth in children is affected by their relationship with their parents, siblings, friends and colleagues, in additional to their environment, culture, and community where their families and educational institutions (kindergartens) are located. Thus, social growth is dependent on adults and the cultural community. The child's social development is also affected by his health condition, intelligence and whether he is an introvert or not. Moreover, according to Dr. Atif Fahmi (Fahmi, 2007, p. 23) children's social development is sensitive to other factors such as their gender, their relationship with their teachers at kindergarten, their family's economic situation, and their ranking among family members. All these points can have a direct impact on the child's social life in the future.

In conclusion, the four major aspects of child's development - mental growth, physical growth, social growth and emotional growth - are integrated and consecutive. They are affected by several variables, such as genetics, the quality of food, and their social and cultural environment. Children depend on their senses to discover the world and start dealing with their daily problems and needs. Thus, designers must focus on children's ways of interacting with their surroundings, for instance, by surface touching, smell, and following objects, colours and shapes. These are considered the first connection methods that children use to connect and react with their environment and could be used as tools by designers .

### 2.2.8. Notes about the learning environment that focus on thinking process and skills

The child must be given enough freedom to learn and gain for themselves, and it should also be noted that teachers who speak too much could crush a child's desire toward creativity. It should not be expected of children to complete all the tasks at the same moment because some pupils might need more time to think about these tasks and the best ways to complete them. Pupils must be provided with enough promotions on boards, walls or work desks.

These tools can boost their minds if they are provided with plenty of space for movement and work .Some children may prefer to work and play in small groups for some of the time, but the majority of innovation occurs when the child works individually. It has been discovered that discussion and argument between a child and his teacher at the beginning of work or activity could boost his thinking. The teachers' duty toward their talented and creative pupils is to provide them with additional simple tools, which help them to boost their minds, as individual cases. On the other hand, teachers must not force pupils to work on activities that may not be interesting for some pupils if they show evidence of this at the beginning of work.

Kindergartens must provide their staff and children with enough tools and necessary equipment that are suitable for work and the variety of activities. Teachers and children should not stop working due to a lack of tools or materials.

Children should not feel failure in doing and completing any activity. However, they should feel that they have done and completed what they should do in the right way. There is no doubt that if children feel failure at some point, it means that the learning environment, the education plan, or methods must be redesigned and reorganised. Any defect with them must be addressed immediately (Fahmi, 2007, pp. 32-33).

In brief, giving enough freedom to children to learn and gain skills is an important issue in their development and future progress. Teachers as well as designers must encourage pupils' desire toward creativity by respecting their ability to complete a task and think about it, as well as providing children with enough promotions in their environment. These promotions could boost children's minds if they are provided with plenty of space for different activities or movement and work.

## 2.3. THE PSYCHOLOGICAL EFFECT OF COLOUR ON CHILDREN

People realised that they needed colour a long time ago. They needed it in their clothes to look younger, more beautiful and active. Moreover, they also became aware that colour can exceed this role in their daily life (Maleek, 2005). According to Professor Ahmed Hejazy's research in colour therapy, colours play a vital role in human life. It is easy to notice that they are always linked to culture ceremonies, festivals and mental therapy. Colours affect the human body, soul, mood, behaviour, and sense of comfort. They have a clear effect on daily lives (Hejazy, 2005).

According to Ahmed Hejazy (Hejazy, 2005, p. 9) many of the modern theories on colour are related to Hindu scientist Garialte who, in 1933, showed and explained the disarray of the different coloured rays of light and the effects of various treatments on the organism. There is a range of colours which can lead the human being to feel happiness or sadness. Moreover, there is another range of colours that could easily lead people to change their mood feel tired or bored and warm or cold; it can even stimulate energy or frustrate it (Birren, Color Psychology And Color Therapy: A Factual Study Of The Influence Of Color On Human Life, 2007). Therefore, colours could have a negative or positive impact on human lives. In addition, it has been discovered that children could have higher sensitivity to the effects of colour, especially bright colours. In a recent experiment, young children were divided into two groups, and put in two separate rooms of different colours: one was a bright colour, and the second was pale grey. The effect on children was different: the first group in the bright colour seemed healthy, active, far from fatigue and happy, unlike the second group. The second team were coughing and sneezing in general and they looked lazy and unhappy (Hejazy, 2005, p. 12). In another experiment, there were two teams of pupils. The first team was located in a room that had been painted blue, where pupils felt cold. Thus, they felt that they needed to increase the heat by three degrees more; whereas, when the same room was painted red, the second group of pupils felt that it was fine. They did not need to increase the heat.

There are two special colours which could have positive effects on the human being, contributing to higher mental stability and relieving both stress and fear. These colours are green and blue. This may be the mercy from God that created skies and seas in blue and made plants in green. This concept could be identified as the reason that farmers in villages, where there are fields and farms and where it is easy to see the harmony of colours between blue, green and white, are healthier than urban people. Maria Simons from Johns Hopkins Medical Institution believes that the harmony of natural colours, which have been always seen in country life, is one of these reasons. She sees other advantages in those colours, which aircraft designers and engineers know very well. Blue and green colours are very useful in reducing nervousness and dizziness that could happen to passengers on airplanes, whereas they discovered that yellow and grey had a bad effect in this area.

A recent study shows that children suffering from mental problems could be improved by changing their colour environment from bright colours to both light blue and royal blue. Those colours could lead to reducing high rates of stress and blood pressure in children. Furthermore, there is a common colour that is called “Baker Miller Pink” that is used in more than 1,500 hospitals and medical clinics in the USA. The impact of this colour can start within 2.5 seconds and it is easy to note its effect after 15 minutes, and also that it has a faster effect on younger children. This colour has had a positive effect on people who have suffered from being overweight as result of consuming a lot of snacks between main meals, by letting them watch and focus on a pink square, freeing them from stress. Stress or depression could be the first reason why people consume too much food.

Colours have a sociological effect on human’s weight. Objects that are painted with bright, cold colours could easily appear to the beholder to be much lighter than warm and dark colours (Nassar, 2008, p. 119). Moreover, colours can have a sociological impact on dimension, space and distance as deceives the eye. For example, light colours, especially light blue, can give a feeling of wideness, whereas warm colours can give viewers the feeling of shortness in distance between the viewer and the object. This could cause them to feel that they are in a narrow and limited space. Morton Walker outlines the power of some colours on human (Walker, 1990), as follows:

1. Red: gives beholders the feeling of blood and fire, which leads them to feel warm. It also causes high blood pressure and deep breath .Moreover, it is considered an energetic and active colour that has a strong impact on human mood and nature.
2. Orange: a burning colour that gives a warm feeling and excitement. Some people see relaxation in this colour, whereas others see stress.
3. Green: the colour of nature, fresh and relaxing. It helps people to be more patient. Therefore, it is used to cure them from stress and hysteria.
4. Blue: the colour of the sky and water. Thus, it gives a feeling of refreshment, transparency and also could stimulate creativity in such a phantasy atmosphere. It is used to reduce stress and high blood pressure. Moreover, it is considered the colour of peace, because recent experiments show that this colour is considered the most powerful one to relax mind and soul.
5. Yellow: the colour of sun.

Faber Birren clarifies the relationship between colour preference and personality (Birren, Your Color and Your Self: The significance of color preference in the study of human personality, 1952). Examples of this relationship are as follows:

1. Red: Strong, vigorous, active and sympathetic.
2. Orange: Convivial, amiable and gregarious.
3. Yellow: Intellectual, idealistic and philosophical.
4. Green: Understanding, tolerant, agreeable and trustworthy.
5. Blue-Green: Discriminative, sensitive and artistic.
6. Blue: Conservative, sensitive and serious.
7. Brown: Steady, substantial and dependable.
8. White: Lovely and decent.
9. Grey: Calm, sensible and conservative.

10. Black: Conceited and sophisticated.

Faber Birren even believes that it might be wise for a person to marry someone who shares the same colour preference. This indicates to the importance of this issue on the people future and their entire life.

Take into account the impact of colours in picture, being presented in children's textbooks on children's personality and psychology. They could help pupils to accept them and make the learning process easier. Pictures in stories could especially help children to react to the events in the stories and make stories more immersive. In addition, pictures can help children to transmigrate the character of the hero, better reaching the aims of these stories to impart morals, manners and behaviours or knowledge and new information.

The gender and age of children have their impact on colour preference. Thus, it may be noted that boys tend to prefer a range of colours that is different from girls. The colours that boys often like could be called "male colours" such as orange, yellow, black and green, whereas the colours that girls usually prefer could be called "feminine colours" such as sky blue. In addition, young women prefer pink and white and adult women like black. However, in a specific age both genders, coincidentally, could almost share the same favourite colours, such as red, lemon yellow and purple (Hejazy, 2005, p. 19).

Thus, care must be taken very carefully in the selection of colours in their surroundings, such as their clothes, home, play areas and schools, because colours can have a direct effect on their views on life (Yahya, 1995). In addition, designers should know the impact of colours on children's mental health for both genders.

### 2.3.1. The significance of pictures and colours in children's learning

Before joining school, children depend on their senses to get information and knowledge from their environment by depending on environmental contents such as physical materials and life activities. Children like pictures from an early age, especially the light colours. Moreover, they can distinguish between pictures and comment on them (Nassar, 2008).

Erasmus points to the significance of pictures in children's learning processes (1466-1536 AD). John Amos Comenius published some of the first picture books for children, called "Orbis Sensualium Pictus" (The Visible World in Pictures), which published in 1658. His book is considered the first learning book for use at primary schools and depends on using images and graphics as an educational tool for children (Comenius, 1658).

According to Yacoub Elsharony (Elsharony, 2005) a child at the age of three can read images by repeating the names of things in these pictures or imitate their animal voices when they view them. In the fourth year of the child's age, they start to make comments, indicating their emotional involvement in photos, such as: poor, fell to the ground, he flew, and do not cry. Thus, it is easy to be note that pictures are the first link connecting children with books, even before learning reading words. Moreover, images can attract children to books because children choose books according to their cover image. Beautiful pictures are considered a magnet for children, which can by their bright colours and simple lines draw attention to themselves.

It is noted that children prefer coloured pictures to black and white. Jenkins (2001) and Travers (1970) agree that using colours in images can facilitate the perception of the relation between the image elements and their details for young children, because by colours children can classify, choose and notice objects or express things.

### 2.3.2. The principles of attention and image design provided for kindergarten children

Attention is focusing process on specific things while ignoring other objects that may come together in the background of the event in our environment (Abedelmajeed, 2005). The designer of learning pictures and activities photos for children must take into account some basic principles to attract the attention of the child to the image, as well as to release the images' relationships and aims. Muhammed Metwally Qandeel (2000) and Muhammed Nosra (2005) agree about the following points:

1. Big things draw more attention than small objects.

2. Bright colours attract more attention.
3. Anything new could attract attention. These are things that break routine or are different from the previous experience.
4. Motional pictures can attract attention, such as a picture showing a mother carrying her child (Nassar, 2008).
5. Complication could attract attention if it does not exceed the ability of audience to understand and realise (Jad, 2003).
6. People aim their attention to what they want. It is directed toward what it is suggested by their experience, interest and need (Justice & Lankford, 2002).
7. Designers should make a balance between new and usual, simple and complex. It is important to avoid boredom from familiarity or concern from new and complex ones.
8. It is very important to give variety for stimulation in order for the receivers to avoid stress, exhaustion or boredom.

In brief, designers of children's pictures must keep in mind creating big pictures, which have bright colours that attract children. Moreover, they must take into account children's emotions when they choose these subjects and keep a balance between common and modern or between simple and complex. Furthermore, there is no doubt that all these previous points must not exceed children's ability to understand and realise.

# Chapter 3 : KINDERGARTEN USERS' NEEDS, DIFFICULTIES AND PROBLEMS IN PALESTINE

## 3.1. FIRST KEY FACTOR: THE EXTERNAL ISSUES (WAR IN PS)

The conflict in PS has created exceptional circumstances that were intended to be temporary. However, unfortunately, they have lasted for more than six decades, which has left a negative impact on all aspects of life.

The nature of this unusual conflict must be understood first in order to form a background which enables readers to absorb the consequences of this conflict on the sectors of early education. Therefore, this study will explain how the closure of the Palestinian Territories for long periods, curfews, economic blockade, lack of medicine and food, and the deterioration of health conditions have had an effect, directly or indirectly, on Palestinian educational institutions.

The study will then present how these conditions could impact negatively on MOHE's ambitious future plans for building and developing the early education sector, especially those which are related to licensing KGs and their facilities. In addition, this part of the study will show how this conflict could extend its effect to include all families and individuals (children and staff), who have had their chances to even attend these educational institutions affected.

Furthermore, by presenting this part of the work, this study aims to explain what could seem later as neglect by MOHE to develop these facilities for early childhood, and the law and regulations. In addition, it will explain what may seem to some as neglect in following the strict laws in the licence KG facilities for a long period. Illustrating this point will clarify the cause of focusing on the future licensing conditions to address the psychological condition for early childhood by taking into account the difficult economic conditions, which the Palestinian community is suffering from as well as the state alike.

### 3.1.1. The general impact of the first key factor (war in PS) on the education sector

The aim of this section is to identify the impact of this conflict on education by outlining its effect on some of the most important elements of the teaching and learning process, namely: child, teacher, and the learning environment. This will then be taken into account while writing the laws and new legislation to license KGs, which must work to contribute as much as possible in support of the three basic elements of education.

This part of the study will address the psychological impact of military occupation and its recent military escalation on the child as a human being in the first place, and secondly as a student. Then some of the unusual measures that are being practised directly by the Israeli occupation force or practised by the settlers with direct support from military force will be identified.

In addition to focusing on the psychological aspect of the child, this section will focus on freedom of movement and access to educational facilities. It will present their impacts on the children and their teachers as well as on the educational outcomes. There is no doubt that all these restrictions will affect any laws and regulations drafted in the future. This should put this matter and all its disadvantages and its aftermath in the study for treatment purposes.

The excessive use of violence by the Israeli Army in the occupied territories caused a large number of injuries and several disabilities. There was also a large death toll during the short life of the second Intifada (see Table 6).

Hence, according to Mahmoud Mowafi (Mowafi, 2009), the Palestinian pupils have been affected greatly because of this unequal conflict. They have been subjected to psychological and social influences that will affect their present and future, for the following reasons:

a) the spread of confrontations over a wide swath of land
b) the huge number of death tolls and wounded that occurred in a short time
c) large numbers of people from different groups and all classes have either directly watched the scenes of violence during the clashes with the IDF or seen the bombing

of the various sites of Palestinian residential areas by aircraft, tanks, and warships from the sea

d) the widespread use of media such as television and the internet have contributed to the wide transfer of images of bombing and the military invasion for a large segment of people who did not see the events directly.

In order to understand the magnitude of the problem and the difficulties of living in warzone areas such as the Palestinian Territories, especially for children, Table 6 can demonstrate a general view of the circumstances surrounding the Palestinian child and can give an idea about what he or she has to face under the Israeli military occupation. This table is important to get into the heart of the matter; it is necessary to mention some of the figures from the remnants of the occupation crime during the past decade between 2000 and 2011. A MIFTAH Organization's report (MIFTAH, 2011) points to the PS casualties and material losses in this period, and depends on NGOs and the Palestinian Ministries' statistics, including the Palestinian Central Bureau of Statistics (PCBS), MOHE, Palestinian Red Crescent Society (PRCS) and others.

| The number of | | The number of | |
|---|---|---|---|
| Palestinian wounded | 51,017 | Destroyed and burnt outlets and economic facilities | 7,992 |
| Palestinian permanent disabilities | 5,735 | | |
| Palestinian death toll | 7,400 | Destroyed houses | 10,489 |
| Child victims | 1,300 | Damaged and destroyed vehicles | 12,088 |
| Women victims | 582 | Damaged and burnt mosques | 257 |
| Closed land | 238,932 $Km^2$ | Damaged and burnt churches | 52 |
| Land confiscation | 27,429.55 $Km^2$ | Damaged educational facilities | 543 |
| Destroyed agricultural land | 8,3169 $Km^2$ | Damaged and destroyed hospital and medical clinic facilities | 244 |
| Cut of fruit trees | 1,193,074 | | |
| Damaged plastic greenhouses (approximate) | 3,300 | Damaged water wells and pond water | 771 |
| Damaged water pipes | 147,060 m | New housing units and caravans in settlements in the Palestinian Territories | 83,053 |
| Destroyed beehives | 4,380 | | |
| Destroyed farm livestock | 739 | | |
| Cattle killed | 8,539 | New outposts in the Palestinian Territories | 199 |
| Poultry killed | 389,587 | | |

**Table 6: Casualties and material losses from September 2000 to the end of 2010 (MIFTAH, 2011)**

Prof. Muhammad Khalili Abudaff, who is a Professor of Education and the Dean of the Faculty of Education at the Islamic University of Gaza, shows in his paper (Abudaff, 2007) the violations against Palestinian children by the Israeli occupation. They are against the children's fundamental rights, which are supposed to be guaranteed in the resolution of the General Assembly of the United Nations No. 44/25 in 20 November 1981 and 1989, which are:

1. The right to life
2. The right to an adequate standard of living
3. The right to psychological security and peace
4. The right to recreation and play
5. The right to education.

Muhammad Khalili Abudaff sees that all the above rights have been violated by the Israeli Military Occupation for the Palestinian territories, which has an enormous impact on childhood and the children's future achievements (Abudaff, 2007). The recent military escalation has a direct and indirect negative impact on the education sector as well as on the children, who are the main part of this process. It is believed that education in the Palestinian territories faces huge difficulties and problems, which do not seem reasonable or justified, and are:

1. Destruction of the educational infrastructure
2. Barriers to Education: Access to schools
    a) by the Israeli Military
    b) by Israeli Settlers
3. The destruction of the PS Economy and the impact of the economic siege on the education sector
4. The recent military escalation and deterioration of the health sector and its impact on education.

The above violations are explained in the following pages.

### 3.1.2. The impact of the Israeli military occupation on the education sector

**Destroying the educational infrastructure and its impact on a child's psyche**

The right to education has been guaranteed in Article 28 of the rights of the child (UN, 1989), which has been violated, as have other rights, by the practices of occupation. It is presented in closing educational facilities and the bombing of schools; since the outbreak of the second Intifada, 543 educational facilities have been demolished or damaged by the IDF (see Table 6).

Schools can be closed by direct military orders, an example of which happened in 2003 when 880 schools stopped working for 22 days continuously, and 197 schools were raided in one year, between 2002 and 2003. These figures have been submitted to the International Islamic Organization for Education, Science and Culture (ISESCO) by Dr Wasif Mansour, who is Minister Plenipotentiary at the Embassy of Palestine in the Kingdom of Morocco, at the international symposium on children's issues from an Islamic perspective (Mansour, 2006). According to the United Nations Children's Fund (UNICEF), by the end of 2003 300 Palestinian schools had been damaged in the conflict. Some of these schools remain closed after being declared military outposts by the Israeli Army (OCHA).

It has been recorded that 25% of injuries occurred in school children between 2000 and 2002 (Halileh, Daoud, Khatib, & Mikki, 2002).

According to Abdulrahman Hussein (Hussein, 2010) the impacts of occupation on the educational achievement and the psychology of pupils of Palestinian children are:

a) Avoiding forming new relationships with colleagues and relatives
b) Nervousness and violence in dealing with their classmates
c) Interest in watching television news and neglecting studying
d) Neglect of homework and preparing lessons
e) Lack of understanding and comprehension and reduced concentration and attention
f) Low achievement in academic levels
g) Low rates of success in school
h) Increased rates of absenteeism from school

**Figure 34: Palestinians run for cover after an Israeli air raid struck a UN school in Gaza in 2008. The photo shows the use of white phosphorus bombs by IDF, which are internationally prohibited, in bombing UNRWA schools. Agence France-Presse Photo.**

**Figure 35: Palestinian students peer into the doorway as they look at a large pool of blood on the floor at a UN school in Gaza, June 2004. Two students, 10 years old, were critically wounded by IDF while attending class a short-time earlier. (AP)/Kevin Frayer.**


**Figure 36: Martyrs: Ahid Firas, Esam Zainab, and many other pupils who have been killed by Israeli raiding of Gaza schools in 2008. (AFP).**

**Figure 37: A Palestinian schoolgirl walks carefully past an Israeli tank near her school in the West Bank town of Nablus.**

**The above photos (34-37) show some of the personal and psychological problems of Palestinian pupils as a direct result of the practices of military occupation**

**Barriers to education: Access to schools**

**First: The barriers created by military occupation**

The barriers created by the Israeli Army will be explained in the following aspect:

Firstly, the military checkpoints, which reached 607 in the West Bank in April 2008 (MIFTAH, 2011 ) have put the Palestinians in an intolerable situation, not only because they bar trade, impede the development of the economy and access to educational facilities such as schools and universities, limit the movement of people and deprive them from having an adequate standard of living, but also because they are extremely humiliating for all Palestinians. People are sometimes made to stand for long hours in the winter rain or the summer sun before they are allowed permission to pass. In addition, Israeli border officials periodically force Christian and Muslim females of all ages to remove their clothing and submit to searches. In some cases the children are then 'felt' or abused by Israeli officials (Aljazeera, 2010). The strip searches are illegal under numerous statutes. The Geneva Convention, to which Israel is a signatory, prohibits: "Outrages upon personal dignity, in particular humiliating and degrading treatment" and specifically emphasises: "Women shall be especially protected against any attack on their honour". Yet, according to Jerusalemites Organization and Alison Weir's report and interviews with women in the United States, Israel, the West Bank and Gaza, sometimes mothers and children are strip-searched together, at other times little girls are taken from their parents and strip-searched alone (Weir, 2007).

The Israeli policy seems to target only Christian and Muslim children, whatever nationality they hold (including Israeli citizenship) or wherever they were born (even native-born American). On the other hand, there are no reports of Jewish children being strip-searched. El-Haddad, who holds a Masters Degree in Public Policy from Harvard's Kennedy School of Government, believes that the intention of the strip searches is to humiliate Palestinians so that they do not return to PS (Weir, 2007).

**Figure 38: Humiliation and child abuse at Israeli checkpoints. An Israeli soldier searches a Palestinian child in the centre of Hebron. Children have to cross daily on their way to school in the old city of Hebron. (Reuter 20 Nov. 2005).**

**Figure 39: An Israeli soldier yells at a Palestinian child to turn back at the Kalandia checkpoint on 22 May 2002, as he attempts to head from Jerusalem in the direction of the West Bank city of Ramallah. AFP PHOTO/Atef Safadi**

**Figure 40: Checkpoint in Tel Rumeida. Palestinian children on their way to school. Naama Morag (Morag, 2008).**

**Figure 41: The checkpoint near Cordoba School that Palestinian pupils have to pass every day to go to school, in Hebron. (EAPPI, 2010) .**

**The above photos (38-41) show 'The way to school' under Israeli occupation in PS, 607 checkpoints (by April 2008) could create 607 psychological problems for Palestinian students**

It should be noted here that these 607 checkpoints are not located on the border between Israel and the Palestinian Territories, but are located inside Palestinian Territories: on the roads between cities, villages, and refugee camps, and even between neighbourhoods within those cities and villages, in addition to all the checkpoints that are located near the Jewish settlements in the West Bank. Israeli Army checkpoints and roadblocks are sometimes deliberately placed to inhibit access to educational institutions. For example, between March 2001 and December 2003, Birzeit University was surrounded by concrete roadblocks and earth mounds on the road to the University from Ramallah City. The road itself was also demolished several times. Both students and staff, who were coming from Ramallah, were not only forced to walk over 2km on foot to avoid the roadblock, but also often harassed and arrested by Israeli soldiers on the way (Murray, et al., 2004).

**A) The seizure of some schools and conversion into a temporary military base or military camp**

According to Farouk Ghabayen (Ghabayen, 2010), who is the first Director of the Asira Al-Shamalya Secondary School in Asira Town, the school has been closed by the military occupation for use as a military base for about three years, and when they left there was much damage to the building structure and equipment. Students lost many learning days during this period. Moreover, in 'Beit Rima', northwest of Ramallah district, Israeli soldiers at the checkpoints prohibit people from crossing, even those who have permits. These checkpoints have caused long delays to Palestinians on their way to work, schools or universities. Daily, hundreds of young men and pupils with their bags climb walls and earth hills to avoid checkpoints (ARIJ , 2003).

**B) The impact of checkpoints on the education system**

According to Amira Hass, who is a prominent left-wing Israeli journalist for the daily newspaper Haaretz, in the last few years MOHE was forced to change the original placement of almost 30% of the 35,000 teachers in the public schools. Those teachers were sent to schools not according to their expertise and the needs of the schools, but according to their ability to access the nearest school. Since October 2000, hundreds of permanent and mobile military blockades and checkpoints all over the West Bank have prevented passage between cities, villages and districts. Teachers who live a few kilometres away from their school could not promise to arrive on time, if at all (Hass, 2003).

This unique situation can be explained and clarified: the reason why there are teachers of Art teaching physical education and maths teachers teaching religion is because he/she was the only available teacher at that classroom on that day. In the Intifada years the Ministry had to reallocate 4,000 teachers, with changes in the location of the checkpoints. Although, in many cases, their original homes were located 5–10 kilometres from their school, hundreds of teachers have rented flats in the city or villages where they teach, to prevent them from being forced to waste hours at the checkpoints every day. Teachers need to pass through such checkpoints twice a day (to go to/return from work).

In addition, Jihad Zakarneh, who is the Deputy Palestinian Education Minister, admits that, while they are maintaining the framework, the quality is suffering, because all the teacher training programmes were frozen between 2000 and 2003 as a direct result of the access problem. Moreover, he confirms that the expectation of the Ministry is very limited towards the thousands of teachers and students who come to school exhausted after a night of shelling and exchanges of fire, or after long and humiliating detainment at a military checkpoint. He added there is no doubt that this problem affects their concentration and the teacher's ability to teach and the student's ability to learn. Zakarneh says that 44% of literature students failed the matriculation exams, as did 20% of those studying sciences. The results of these exams were lower than the annual average. Only 4–5% of successful students graduated with honours in this period, although a lot of Education Ministry employees, teachers and parents believed that the final degrees in this period were systemically increased. It seems that this occurred to cover the basic weakness of the Palestinian school system (Hass, 2003).

**C) Palestinian way of dealing with these problems**

When the military occupation declared a curfew for a long period, Palestinian people tried to keep their lives moving forward and running as normally as possible. They created 'Popular Schools', where students and teachers meet wherever possible to prevent young people from falling behind in their studies. In this way parents and the local communities tried to rescue this situation and solve their children's education problem. According to Mohammed Ballas (Ballas, 13 October 2003), the popular committees declared the start of popular education classes in the city and camps. As an example, in Jenin City and Camp, tens of high-school students gathered in five private homes to commence classes. Another seven 'classrooms' were ready for use by elementary students in mosques, and the local committees were planning to open a KG. The committees have begun to call volunteers to teach in these classes. It is believed that the use of this tactic is returning to methods used during the first Intifada, when dozens of neighbourhood schools were launched in the West Bank after Israeli forces shut down schools for months.

Secondly, curfew and closure: Each Sunday in the academic year (2002/2003), 1,085,000 students are supposed to attend 2,098 elementary and secondary schools in the PS territories. About 48,000 teachers will be waiting for them at 8:00 A.M. However, this will happen only when there is no curfew, military blockades or even checkpoints that could prevent or delay both students and teachers from arriving on time (Hass, 2003).

The Israeli Government calls it curfew and the western audience describe it as a lockdown. However, research has been published by NGOs such as the Israeli Information Center for Human Rights in the Occupied Territories (B'Tselem, 2010) and the Human Rights Watch Organization (HRW) that it is a sort of collective punishment and that this military curfew is against human rights. In times of war or riot a temporary curfew may be imposed to restore order, but never for punishment reasons. The curfew in such cases is aimed at protecting everyone, but Israeli forces use the curfew as a form of collective punishment and not to reduce tension (Amnesty International, 1986). It uses it to subject the Palestinians to further harassment and humiliation. Therefore, the continuous policy of forcing millions of Palestinians to stay in their homes by using tanks and guns is considered one of the most advanced forms of violence (Bahour, 2002).

When the military occupation declares a curfew on all citizens in an area, reaching schools or universities becomes impossible, whole school days are missed and schools are effectively closed if the curfew is for long periods. As an example, MOHE reports that 498 government schools were disrupted or closed for varying periods of time due to curfews and closures during the school year 2002–2003, with a total of 1,289 schools closed for varying periods since the beginning of the Intifada in September 2000 (Murray, et al., 2004).

In general, collective punishment in the form of curfews, checkpoints, mass round-ups and closures is part and parcel of Israeli plans to destroy normal life among the Palestinian Arabs. These rules and practices of military occupation cause considerable harm in various walks of life of Palestinian people, including the education sector in all categories and stages. Palestinian children, as all children around the world, have the right to proper education, nutrition and protection from harm.

**Secondly: The barrier created by Israeli Settlers can be explained from the following aspects:**

Palestinian children struggle to go to school alongside settlers. Since 1967, Israel has built 144 settlements in the West Bank, and 12 settlements in East Jerusalem (PCBS, 2009). In addition to the settlements, the Israeli government has built another 168 so-called 'outposts' that do not officially have the status of settlements in the Interior Ministry's eyes, yet enjoy the same protection from the Israeli military, the same funding and the special treatment of Israeli authorities, such as roads, utilities and schools for the exclusive use of settlers (B'TSELEM, 2010). In 2010 nearly 300,000 Israelis lived in such settlements, which were 22,800 in 1983 and 134,000 in 1996. These settlements were established alongside some 2.5 million Palestinians (The Boston Globe, 2009). In 2009 the total number of settlements in the West Bank was 144, whereas it was zero before 1967 (B'TSELEM, 2010).

According to the Christian Peacemaker Teams (CPT), settlers attack Palestinian children on their way to school in front of the Israeli Police Force or under IDF protection. Although many tragic incidents have been documented or even recorded on video tapes, Israeli police refuse to investigate any violence by Jewish settlers towards Palestinians or in the best cases they do not take it seriously (Shiffer, 2009). According to an Aljazeera report about the children abused by Israeli interrogators and soldiers in 2009, all 600 complaints that were submitted to Israel's attorney-general were dismissed. Moreover, this report shows that there was not even one criminal investigation (Aljazeera, 2010).

CPT has documented the settlers' violence, which cannot be justified, on the children. This shows the amount of daily suffering experienced by those children on their way to school. The first day of school is a special event for each child. On this day most children are nervous because they have a lot of inquiries and fears that they would like to have quick answers to, such as 'Will my teacher be nice?', 'Will the other kids like me?', 'Am I going to have homework on the first day?' However, for the children of Al-Bweireh, the first day of school jitters take a new and ominous form. 'Will adults throw rocks at me or assault me?', 'Will they turn their dogs loose on me?', 'Will the armed soldiers intervene in my defence?', and 'Will those soldiers bring further abuse down upon me?' (Dana, 2011).

Al-Bweireh is a Palestinian village in the Hebron region. This village is considered an 'unlucky' village because a new settlement has been established on its confiscated territory, which is called 'Givat Ha Harsina'. The main road, linking Al-Bweireh and Hebron, was closed because this road, as others, has serviced settlers and it is accessible only to them. Therefore, anyone wishing to journey from Al-Bweireh to Hebron must drive miles out of the way on unmaintained, rutted, detour roads, or walk the Al-Bweireh road past the settlement of 'Givat Ha Harsina'. Unfortunately, this is the route children walk each day as they go to and from school. Palestinian children trying to make their way to school on this road endure harassment by adult members of the 'Givat Ha Harsina' community, who often throw stones and use threatening words towards the children. This situation became worse when an illegal settlement outpost was constructed on a hilltop 200 metres from a Palestinian home on land which has belonged to a Palestinian family for generations. The outpost settlers own dangerous dogs, which they use to terrorise the residents of Al-Bweireh. At the request of Al-Bweireh families, members of CPT and the Ecumenical Accompaniment Program in PS and Israel accompany the children to help prevent settlers from attacking or otherwise harassing them, which reduced the rate of attacks by the settlers to a great extent, but could not stop it outright, and attacks against Palestinian children are still being documented (Shiffer, 2009). In the villages of Tuba and Maghayir Al-Abeed, during the present school year settlers have twice attacked young children on their way home, throwing stones, chasing them and yelling death threats. In the 2007–08 academic year, settlers attacked the children a total of 14 times, as documented in the report "A Dangerous Journey: Settler violence against Palestinian schoolchildren under Israeli military escort" (CPT & Operation Dove, 2008).

**Figure 42: Palestinian schoolgirls in Hebron being hit by stones thrown by teenage Israeli settlers, while Israeli police officers are watching and protecting the Israeli settlers. (EAPPI, 2005).**

**Figure 43: 11 October, 2000 – Settlers throw stones at Palestinians outside Nablus as soldiers stand by. Photo credit: Jim Hollander, Reuters.**

**Figure 44: At the top of the world list of gun ownership by civilians is Israel where civilians can carry automatic weapons and concealed weapons in public. Israeli settlers in Hebron (Hilliard, 2011).**

**The above photos (42-44) show 'The way to school' under settlers' attacks that are covered by the protection of IDF**

According to Dr Abdurrahman Hussein (Hussein, 2010), the impacts of these obstacles on the education and the achievement of pupils are:

a) Neglect of doing homework, preparing for class and studying for tests
b) Lack of understanding, comprehension, reduced concentration and attention
c) Increasing the rates of absenteeism, and the rate of dropping out of school (especially for young girls)
d) Low achievement in academic levels.

Political stalemate in the peace process and the different reality on the ground led to an escalation of the violence of events in the Palestinian Territories. There was no real effective development of the service institutions under military occupation. These circumstances led to the outbreak of the second Intifada. The subsequent military action on the ground was unexpected and unprecedented. The IDF worked on destroying and targeting the basic services of life, which led to the destruction of infrastructure of Palestinian Territories. The governmental institutions, hospitals, schools, road network, and water supply were all targeted. This led to the freezing of all the ambitious plans of PS government that were supposed to be used for the development of all governmental sectors and services including the education sector. The educational field may have been affected more than others sectors; this has been targeted deliberately. All of this led to changing the Ministry's ambitious development projects, which were prepared for the development of all sectors of government, including education. Instead, they had to salvage what they could from the existing institutions, which, under these unusual circumstances, became the biggest challenge at this point. As a result of this, all development plans have been frozen for an indefinite period, which will entail re-considering comprehensively all laws and regulations on licensing and management of KGs in the Palestinian Territories.

To summarise the contents above, it is clear that the interior design science does not claim that it has a solution to remove the military occupation or that it can work on concealing the 607 military checkpoints in the West Bank or even that it can work on forestalling a curfew on the young children that prevents them from going to school. However, by applying new licensing requirements, which will be suggested later in this study, it is possible to reduce the psychological impact that accompanies such pressures on the pupils at this stage. By using shapes, corners and levels (Pages 102 and 158-159), this may give them the feeling that they are safe (at least at KGs) and also that they are protected and they have control. In addition, by using colours it may give them a chance to rest their minds and take them far away from news and wars, and to relax (Pages 107-110, 185 and 190). Furthermore, by drawing and playing with different materials they could have the chance to express themselves and release negative energies.

#### 3.1.3.3. Destruction of the PS economy and the impact of economic siege on the education sector

This section will reflect the difficult economic situation experienced by both the Palestinian government and Palestinian families. These circumstances have a direct and indirect impact on the education system and the role that local government is supposed to play by their various ministries, especially through MOHE. This part of the study will clarify how the economic situation could limit the responsibilities of work and contribute to the development of early education in particular. This will further explain the reasons for KGs not being subject to the supervision of MOHE, and also the reasons that led to them not receiving the necessary financial support to establish or develop them. Thus, this will clarify the difficulty of imposing laws and regulations in the licensing of KGs, and in particular licensed educational buildings.

This part of the study will also clarify the relationship between the high rate of poverty resulting from the deteriorating economic situation and the low rate of enrolment in KGs in PS. The equation between these difficult economic conditions and standards of health and safety and its requirements is not an easy formula to balance; it may require specialised expertise in installations instruction for early childhood and in developing appropriate solutions. This may not be possible for MOHE today.

Finally, it will indicate what the impact of the above will be on the authors of the new laws of licensing KG facilities and on their future plans in the process of development and building.

**A) Overview of the current economic conditions in PS**

The Palestinian Territories have been under military occupation since 1967, which has left a negative impact on social and economic life. It is clear that PS is considered a region most in need of help and development. Palestinians are suffering from poverty, lack of equipment, materials and experience, which is expected as a natural result of being under occupation. These problems can easily prevent the development of education.

**B) The impact of the deterioration of the Palestinian economy on KGs**

(Budget deficit and the (PNA) financial support for early education sector)

According to the World Bank, the entire Palestinian budget for 2010 was just $3.8 billion and the budget deficit was about $1.2 billion, which was covered as financial support from the international community (Alayam Newspaper, 2010). This gives a clear view of the weakness and fragility of the Palestinian economy. Clarification of the Palestinian financial difficulties identifies the general weakness of financial support in the education sector, which does not include the Palestinian KGs (Seattle Times News Services, 2006).

- **Poverty in PS, child workers and KGs: Dropping out of school for students and the weakness of KG enrolment**

The poverty rate in PS is very high when compared to surrounding counties such as Israel, Jordan, Syria and Lebanon. The Statistics Bureau, in an annual report, said 51.8% of Palestinians in the Gaza Strip and 30.3% in the West Bank in 2005 lived in poverty (Assadi, Thu Jun 26, 2008). However, these numbers have increased rapidly because of recent practices of the military occupation in the Palestinian Territories, which reached 49.1% in the West Bank and 79.3% in the Gaza Strip in 2007 (MOP, 2009).

The Statistics Bureau defines any six-member family that earns less than $572 (£357) per month, which is approximately $3 a day per person, as below the poverty line (Assadi, Thu Jun 26, 2008). The World Bank uses $2 per day as a measure of poverty (Bauer, Hasan, Magsombol, & Wan, November 2008).

The proportion of child workers in the West Bank – whether paid or unpaid – was 9.5% in 1995 and dropped to approximately 6.5% in 1999 after coming PA and take control with the education sector and establishing MOHE (PCBS, 2001). These numbers have increased too for the same reason (poverty), which led to an increase in the percentage of child workers (53.5%) in 2007; 37% of them did not attend school and left the educational system (MOP, 2009). More than two-thirds (74.0%) worked with their families without pay (96.0% of females and 70.7% of males). Therefore, sending the young children of poor families to charity KGs will deny these families any possible income that could be earned or saved through the children's work, whether through the family or the labour market. Charity KGs have a hard mission to attract children to their facilities and then keep them there; it is even harder to achieve this with paid KGs or those that require high tuition fees. For example, although there were 125 charity institutions in 1978 in the West Bank, there were just five charitable institutions in Gaza that were supposed to serve around half a million people, which means each one of them had more than 90,000 people to serve in this region in 1978 (GUVS, 1984, p. 68).

About 15% of KGs have closed as a result of destruction or damage to their buildings. Moreover, as a result of the deteriorating economy and widespread poverty, a lot of Palestinian families could not enrol their children in KGs, because these facilities were considered to be in the private sector that requires payment of tuition fees for admission. The number of KGs, which increased 93% in the peace period

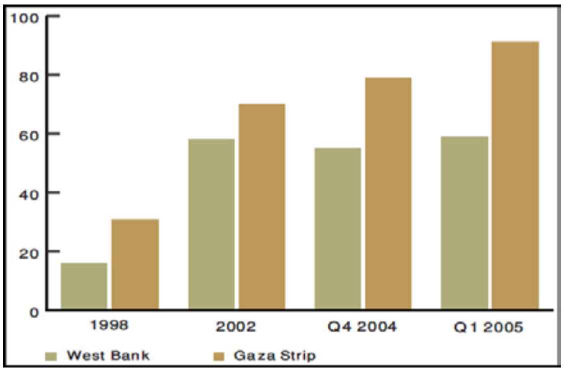



**Figure 45: The percentage of PS families who are living below the national poverty line ($2.3/day) by region (PCBS, 2005).**

between 1994/1995 to 1999/2000 from 436 to 843 buildings, reduced by 15% by 2007. The percentage of children who were enrolled in KGs in the academic year 2006/2007 was only 24.9% of children aged four to five (MOP, 2009).

**C) Economic siege and its impact on: the KG enrolment rate, the provision of stationery, and various KG activities**

According to Abdurrahman Hussein (Hussein, 2010) the impacts of the economic siege on the educational achievement and the psychology of Palestinian pupils are:

a. Dropping out of school to help families economically
b. Inability to provide necessary books and stationery because of the siege and poverty
c. Staying away from participating in school activities and trips because of cost
d. The deprivation of going to KG because of cost
e. Negligence in grooming and personal hygiene
f. Sense of deprivation because of the inability to buy desirable things at school (such as candies and beverages), because of the reducing of their personal pocket money, if there is any.

Amira Hass reports (Hass, 2003) MOHE concerns about the school dropouts issue. They work on the prevention of dropouts, which is considered the most important task, despite the huge logistical, economic and psychological difficulties. However, the increase of the dropout ratio has become a phenomenon as a result of the attraction of children to the labour market. The attraction to this category has led to the increase of the dropout rate in schools. These phenomena have become clearer in seeing hard economic situations similar to that which happened in the PS territories (Mahshi, 2000).

Jihad Zakarneh, who is the Deputy Palestinian Education Minister, confirmed that the monthly salary of a new Palestinian teacher in the public school system is low, and when the current difficulties as a result of the occupation practices are added to it, depending on a teaching income as a main source of living becomes highly questionable. With this salary, a lot of the teachers are forced to find a second job. They work at gas stations, as drivers, and as salesmen. They have to concentrate on providing basic needs for their children. Therefore, they cannot concentrate on developing their children's needs (Page 130), not to mention those of other children in schools (Hass, 2003).

In brief, it is clear that the economic situation has a significant impact on the whole education process. The deterioration of the economy has affected parents’ ability to send all their children to KG. The provision of school stationery has become an annual challenge for a wide range of Palestinian families, who have to face it each semester. It is not only about the tuition fees but includes simple requirements such as buying school stationery or uniforms to obtain non-free or even free education (by charities). Therefore, the Ministry must take the current economic situation into account while writing their first laws or guidelines for the majority of families, some of whom earn less than $2.5 a day for the average of six members in each family. Moreover, they should keep in mind the limited resources of many KGs that may have to close if they cannot achieve the new requirements to re-licence their buildings under the future terms and conditions. The new requirements must be graded, and should be applied at varying stages that take into account the economic situation. In addition, these new conditions must be accompanied by the development of educational staff and their awareness of the importance of these conditions for child’s health and safety and learning environment within KG facilities. Furthermore, because teachers cannot teach a student with an empty stomach (David Ndegwa, 2012) and because the Palestinian people believe that education is the best way to fight poverty, the local government and the international community, which focuses on supporting and developing Palestinian society, must work together to improve both factors at the same time to achieve better results.

#### 3.1.1.4. The recent military escalation and the deterioration of the health sector and its impact on education

This section of the research will show the impact of the practices of the Israeli military occupation on the health sector, with a focus on its direct impact on the health of the child. It will also explain the impact of the deterioration of the health status on the educational process at this early age. At the end of the section, it will show how the legislators of KG licensing laws can contribute to reducing its impact on the child as much as possible with the handling of its negative effects through the formulation of legislation and new laws that take into account this significant aspect.

**A) Access to medical services**

The Intifada has had an enormous impact on Palestinian health care. Mobility restrictions make it impossible for people in need, who are looking for the health care services, to reach them on time. According to the Palestinian Medical Relief Society (PMRS), closures prevent Palestinians from accessing primary health services, and approximately 70% of the population is cut off from hospital care for weeks and months (PMRS, 2006). In addition, the destroying of health facilities and infrastructures, power lines and water filtration facilities, as well as the lack of medical vaccines and follow-up processes have all impeded the development of health care in the Palestinian Territories (see Table 6).

**B) Injuries among children**

In order to compare the types of injury mortality in children aged 0–19 years in the West Bank and the Gaza Strip (Palestinian territory) with similar data for children in Israel, England and Wales, A. Shaheen and P. Edwards used data from death certificates covering 2001–2003. Death rates per 100,000 children per year were estimated. The leading cause of injury mortality in Palestinian children was accidents caused by firearms missiles (9.6 children). In comparison, transport accidents were the leading cause of death in children in both Israel (5.0 children) and England and Wales (3.5 children) (Shaheen & Edwards, 2008, p. 414). Regarding child deaths and injuries, there has been an increase in the number of child deaths as a direct result of the Israeli army and settler existence in the Palestinian Territories.

The majority of child victims are under the age of 12. The use of 'deadly force' against children has increased rapidly. According to the United Nations Economic and Social Commission for Western Asia report, those young children were killed in situations where there was no confrontation occurring at the time of death.

**C) Healthcare**

Although great efforts have been taken by the international community, health care agents, and donors to improve the health services for Palestinian children, this sector still suffers from huge problems. Despite improvements in infant mortality rates and child mortality rates (children under the age of five), there has been an increase in the child mortality rate (children between the ages of five and nine) with the primary cause of death reported to be Israeli violence. It has also been stated that the Palestinian Territories face a 'distinct humanitarian emergency' due to the prevalence of Global Acute Malnutrition, with four out of five children suffering from iron and zinc deficiencies that cause anaemia and immune deficiencies (ESCWA, 2004).

**a. The effect of curfews and closures on health care**

Israel's restrictions on Palestinian movement, such as curfews and closures, have led to a rapid increase in the rate of unemployment and poverty (see Figure 45). This has caused a serious decline in children's health because families are unable to provide their children with enough proper food. According to the United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA), access to food has become a difficulty; in some areas, almost 80% of the population is unable to afford basic food (UNRWA, 2011). A January 2003 report by CARE International noted that chronic malnutrition among children under five years has reached emergency rates, and over 40% of children in that age group are anaemic (UNRWA, 2003). Jean Ziegler, who is the UN Special Rapporteur on the Right to Food, has confirmed this problem in his report in October 2003. He states that the Palestinian population of the West Bank and the Gaza Strip is on the verge of a man-made 'humanitarian catastrophe'. Over 50% of Palestinians are completely dependent on food aid, and severe malnutrition rates among children in the Gaza Strip have reached those found in sub-Saharan Africa (Ziegler, 2003).

According to Ziad Abdeen's report (Abdeen, Greenough, Shahin, & Tayback, 2003), the clinic managers asked the Palestinian mothers for their perception of the causes of malnutrition among their children who visit their clinics. Ranked as 'very important' by percentages of respondents in descending order are the following:

| | |
|---|---|
| Family economic problems | 83% |
| Frequent diarrhoea infections | 73% |
| Unavailability of food | 68% |
| Frequent non-diarrhoea infections | 50% |
| Poor food choices among care providers | 38.5% |
| Problems related to food distribution within the family | 34% |

**Table 7: Palestinian mothers' perception about the causes of malnutrition among their children**

**b. Health problems that are related to military escalation and the deterioration of the economy**

The weakened state of a child's immune system, particularly when influenced by factors such as lack of clean water, overcrowded living conditions, poverty, lack of sewage disposal, and incomplete immunisation, can lead to a whole host of other infectious diseases including: Hepatitis A, chickenpox and parasitoids, Brucellosis, and water-borne diseases such as scabies, skin infections, shigellosis, and diarrhoea (Table 7).

Child growth is an important indicator of children's wellbeing. Stunting, as well as being underweight, is a good indicator of acute malnutrition (Figure 46). The bar graph below shows the percentage of children, five years old, in the Palestinian territories between 1996 and 2006 who suffered from stunting. The data can be separated into three groups: the average in the Palestinian territories, the West Bank and Gaza. It can be clearly seen in the chart that the percentage of stunting in Gaza is much higher than in the West Bank. This is likely to be because the economic situation in the Gaza Strip has been worse than in the West Bank, especially after 2000. As can be seen in the chart, in general, the percentage of stunting has increased steadily in all periods. The percentage of stunting in Gaza dramatically increased from 8.2% in 1996 to 13.2% in 2006. In the West Bank the percentage increased too, from 6.7% in 1996 to 7.9% in 2006. Moreover, it reached a peak in the West Bank by 2004, with 8.8% of the children (PCBS, 2006, p. 151) being stunted.

Another health problem that military force could cause is the exposure Palestinian people to excessive doses of x-rays, which could have a negative impact on the public health. The Israeli military has installed them in many checkpoints that have been crossed by thousands of Palestinian people on a daily basis, including their young children who have to cross them daily to access their schools (WHO, 2006).

According to PCBS statistics in 2004, 22% of Palestinian children were suffering from critical or chronic malnutrition. It is estimated that 54.4% who are below the poverty line are children. Among the most prominent causes of this suffering are road closures, checkpoints and curfews imposed by the occupation, as well as the reduced purchasing power of the Palestinians.

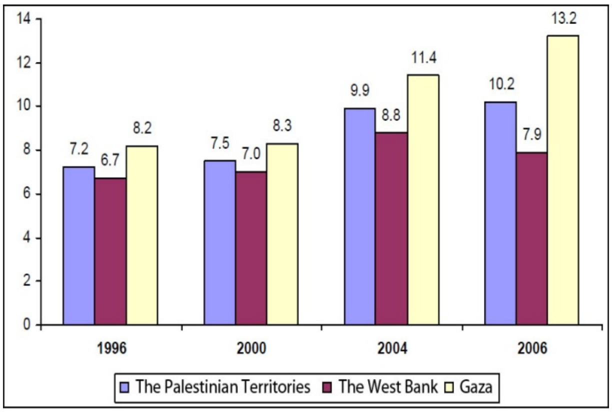



**Figure 46: The percentage of stunting in Gaza, the West Bank and the PS territories between 1996 and 2006 (PCBS, 2006).**

**c. The impact of the deterioration of health status on education**

Both critical and chronic malnutrition could have a negative impact on young children's development, which will be felt later in all pre-schools and school stages. This can easily affect their future academic achievements. Shahnaz Vazir's research focuses on studying the relationship between both the psychosocial development of children (under six years old) in the rural communities in India and their economic situation (the families' incomes), in order to be compared to and assessed by the Developmental Quotient (DQ) of the young children, which shows delayed development among the malnourished children. This delay is found mainly in areas such as: vision, accurate movements, language, understanding and personal-social relationships. This leads to a delay of their cognitive age of between seven to eleven months in these areas in different age groups (Vazir, Naidu, & Vidyasagar, 1998). Jere R. Behrman also supports these findings when he confirms, in the Copenhagen Consensus Challenge Paper, the indirect positive impact that could be gained by developing the nutritional status for pupils of school age. He makes clear links between nutritional status and cognitive development (Behrman, Alderman, & Hoddinott, 2004, p. 5).

There is a brain research report in the medical field that can support this view. This research was conducted by Gene Blatt and others, and points to the importance of a specific protein in the human brain in relation to early age malnutrition. The reduction of this protein, caused by malnutrition, causes damage to brain cells, because this protein is vital for the brain processes by which a chemical stimulus induces a cellular response (Blatt, Jin-Chung, Rosene, Volicer, & Galler, 1994). In addition, they believe that malnutrition has a negative impact on memory formation (Huang, et al., 2003). Therefore, the effects of critical and chronic malnutrition on the future students' achievements are negative, as they impact on both the brain processes and on the memory ability at all future stages.

There is considerable evidence of direct links between nutrition and productivity. Poor students cannot obtain sufficient calories that they need to be active on both physical and mental levels, which impacts negatively on students' productivity and their ability to learn and move. Moreover, Andrew Foster and others find that the consequence of poor nutrition in childhood is connected to the high possibility of earning low incomes as an adult in the future (Foster & Rosenzweig, 1993), (Haddad, Yohannes, Alderman, Appleton, & Song, 2003) and (Strauss & Thomas, 1998).

In general, there is no doubt that the military escalation has exacerbated the deterioration of the health sector, which has had a negative impact on the overall educational process. Young children at the KG stage are most affected by this escalation, which has led to the deterioration of their health at both the psychological and physical level. Children need many things to work on reducing the impact of this problem and its consequences. First, they need to be encouraged to follow healthy dietary habits, at least within the learning environment. This can be achieved by increasing the ‘appropriate’ places that are allocated for consuming food for pupils’ lunch or breakfast. Designers may be able to take advantage of the impact of the colours, temperature and the healthy environment on children’s psychology, which could encourage pupils in this trend. Moreover, they could design a corner or allocation space within the KG that teaches them how to pay for healthy food from a store. Although pupils may use fake coins in this process, this can teach them a lot of desirable principles while they enjoy and play. Of course, this alone would not provide a substitute for the periodic medical examination for all KGs, which is recommended to be under the supervision of MOHE. In addition, informing parents of the importance of providing a balanced diet for their child (as far as possible) will be essential too. Direct aid could play an effective role in the treatment of this problem, although it was considered a temporary solution. Direct assistance that has been provided by institutional donors, such as USAID in 2010 which aimed to distribute ample amounts of milk ‘with various flavours for children’ and fresh bread and fruit for pupils in KG, was very much appreciated and effective. It is recommended that it could be part of the permanent plan, managed and administered by or through the Ministry.

## 3.2. SECOND KEY FACTOR: THE INTERNAL ISSUES

This part of the study will work on clarifying the negative internal factors that have impacted on the 'current laws and regulations', which are related to the KG licensing issue, and how to apply them in the Palestinian territories.

The relationship between these negative internal factors in Palestinian society, such as the lack of existing laws and regulations and their impact on both child health and on achieving the basic goals for which KG facilities were set up, will be explained. In addition, it will show how the lack of licensing laws within a weak government, which has been recently established and suffers from lack of necessary expertise in the management of their vital institutions, participates in the widespread phenomena of financial and administration corruption. Today, this corruption may be the most serious problem which the early education sector could face, because it leads to many negative consequences that may affect children's health and safety within their learning environment. It is believed that it can undermine the goals which these educational facilities are established to serve (Mahshi, 2000).

This section aims to show the importance of a quick response and activation for the new regulations, which will be suggested later, in order to treat these issues or at least to work on reducing the impact of some of the negative phenomena in Palestinian society. It could contribute to the lack of a clear legal system in addressing the issue of licensing KGs. Also, it could contribute to bridging a gap that leads to the weakening of the current government to carry out their duties properly.

### 3.2.1. The impact of financial and administrative corruption and the lack of laws governing the granting of licences for the establishment of KGs on the learning environment

The other serious problem that Palestinian KGs have faced is the corruption of local government administration, which is considered in this study as one of the effective internal factors on the education progress. Based on the Oslo Accords, the first Palestinian government was formed in 1996 as a result of the first Palestinian legislative election ever to be held. All Palestinian institutions show the kinds of weaknesses that typically accompany the transition from resistance into independence and statehood. The first Palestinian Legislative Council (PLC) enacted the Palestinian Basic Law or the constitution according to which Palestinian public life is governed. The PLC also passed several laws to organise public work in many important areas such as: Civil Service, Labour, General Budget, Local Government, and the Rights and Duties of the Legislative Council Members, to name but a few (AMAN, 2009).

Unfortunately, some facts were discovered by this study as a result of visiting the Ministry of Education in Nablus City and meeting the managing director, who is responsible for granting licences to KGs in the city and its country in July 2009. First, according to both the managing director and the engineering section at the Ministry of Education '***there are no terms and conditions, which are written by the law, to describe and determine the basic requirements for licensing kindergartens structure***'. In addition, when they were asked about the methodology which has been followed in the granting of a licence to one of the buildings while being withheld from others, the Engineering Department in the Ministry said:

> "After an owner of a kindergarten fills all required documents to establish a new kindergarten and pays all fees, a paper will be submitted to their Engineering Department to start verification and checking of the facility that needs to be licensed. The Engineering Department's mission is sending an architect to the kindergarten location in order to take a close look at it. Then, the architect has the responsibility to write a report as a result of this viewing of the site and its suitability for such 'businesses'. This report will decide whether this kindergarten deserves to be licensed or not. Moreover, the architect's role is usually providing free advice and guidance that contributes to licensing the kindergarten. Yet, the architect does not have any written hand book and guide book that must be based in his/her decisions (neither do the kindergarten owners have one)."
>
> (Ministry, 2009)

Therefore, when the head of department was asked about the methodology that architects in the Ministry of Education are using in building their decisions to grant a permit or withhold it, he said:

> "As a result of there being no written terms and conditions that could outline and rule such cases, architects should use their 'self-estimated, experience in this field and conscience'. However, in general, there are some common laws [unwritten laws], which are considered as public conditions, that can somewhat control this issue. Moreover, we should show some flexibility with them, otherwise all kindergartens in this city will be closed!"
>
> (Ministry, 2009)

In addition, when he had been asked about the rules that inspectors usually use, the answer was:

> "The minimum ceiling height should not be less than about 2.7m or 3m. The kindergarten must have a bathroom, a kitchen and a fenced yard for children's play, at least one window for each classroom and located on the ground floor (although a field research shows that some kindergartens are multi-story or located on the second or even third floor, which are fully licensed!)."
>
> (Ministry, 2009)

This was what could be considered the common law about the construction conditions. Furthermore, he added that in terms of education, each KG must have at least one teacher who holds a certificate that is related to child-rearing competence. The managing director has pointed out that the inspectors' recommendations that could be suggested to KG landlords are often taken seriously.

What could be concluded from this meeting with the Engineering Department in the Ministry of Education in Nablus City in 2009 are as follows:

1. There are no written laws to rule the relationship between the Engineering office and KG owners.
2. An architect's 'self-estimated experience in this field and conscience' is the criteria for licensing (or withholding) KG structures in the Ministry. This could put the health

and safety of children and also the whole educational process in KGs under the mercy of the above points ‘criteria’.

3. This situation could easily lead to inconsistency; as an example, one KG considered unqualified to obtain the licence by an architect of the Ministry could be fully licensed or partly licensed (with some modifications) by another architect from the same office.
4. By giving powers to inspectors of Education for flexibility based on their personal conviction, one inspector's recommendation is enough to grant a licence (without legal controls that must govern the issue), and the absence of laws binding on all the foregoing could encourage both financial and administrative corruption.

These factors not only might licence KGs that could not serve educational aims, but also might authorise KGs that may cause direct danger to the safety and health of the children. This may lead to the granting of undeserved licences to KG owners who have money to pay or those who have power because of their relationship with the government or the local councils.

Problems such as: the desire for low-cost KG facilities with low running costs, quick profit taking, widespread administrative and financial corruption within the PA, lack of laws, and the weak supervision of local councils, lead to the lack in most KG facilities of consistent conditions of public health and safety. Quick profit taking often conflicts with safety rules, public health and sometimes impacts on the main educational aims of foundation KGs themselves.

In brief, not applying the minimum requirements of establishing safe, healthy, accessible, enjoyable and interesting environments in most Palestinian KGs leads to creating unsuitable learning environments for children to grow, learn, create and develop.

The existence of clear laws and regulations will contribute to reducing the phenomenon of widespread financial and administrative corruption that exists in the Palestinian Ministry with regard to licensing the educational buildings. It may help to close the doors of corruption and regulate the relationship between all parties, preserving their rights. The presence of pre-written laws would solve many of the dilemmas and conflicts that may occur as a result of the lack of laws in this field. In addition, it is considered the first step towards a safe and healthy environment for both staff and children.

### 3.2.2. Lack of money or lack of awareness

The second aspect of this section will show: the lack of awareness of the importance of these laws in the life of the child and his educational future; the lack of awareness of the original role that KGs were established for; and the lack awareness around the role that interior designers and specialists currently play in developing early educational facilities. The lack of all these elements has led to the creation of a significant gap, which is more difficult to fill than those resulting from the lack of financial support. It is believed that this is the real problem facing the early education sector over the current financial crisis. Therefore, the current lack of awareness is considered the root of the problem, and should be the first issue to address. In order to illustrate this point, this part of the study will present an example that can explain this view/problem with an attempt to identify the real reasons that led to it.

- **The real motive behind the problem**

It may be noted that, although money has been always used as an excuse to avoid using interior design knowledge in refurbishing or building KG facilities, the last scheme in PS in 2008 to build a new school in Asira Ash-Shamaleya Town shows strong evidence that this is not actually the main problem. Although this educational instructor has been built at great expense and with wide support from an international organisation, the local authority and an architectural office, it shows ignorance of interior design knowledge that focuses on developing a learning environment. This new school, for example, has classrooms which are very typical of many rooms in Palestinian houses, offices or even stores. They share with them the same design, material, colours, lighting system, windows, doors and floorings (Figure 47-52). It may not even be possible to recognise the purpose for which these rooms are built from the first sighting (except for a green board). For example, using inappropriate materials in flooring could influence health, happiness, productivity, comfort and wellbeing. This example is part of a clear pattern of the situation that KGs are suffering from in PS.

**Figure 47: Al-Amal's KG, Asira Ash-Shamaleya-PS. June 2010**

**Figure 48: Hajj Nezar's carpentry workshop, Nablus-PS. June 2010**

**Figure 49: Hamdan's Supermarket, Asira Ash-Shamaleya-PS. June 2010**

**The above photos (47-49) show three types of buildings which use the same kind of universal material to cover their floors (the West Bank).**

**Figure 50: Bathroom floor tiles from Nour Al-Houda's KG, Asira Ash-Shamaleya-PS.**

**Figure 51: Playground floor tiles from Nour Al-Houda's KG, Asira Ash-Shamaleya-PS.**

**Figure 52: Laboratory in Messqat's high school, which is a new school in Asira Ash-Shamaleya-PS.**

**The above photos (50-52) show the same type of international flooring material, which has been used in internal/external KG facilities and also has been used in laboratory bathrooms and outside playrooms, although each one of them has different needs and requirements. Moreover, these floorings are universal and do not reflect the PS pattern, culture and environment.**

The Palestinian contractors and supervisors on these projects believe in using international materials in construction and floor-coverings, such as the tile flooring in Figure 47-52. According to Hassan Sholy (Sholy, 2004) it is occurred because:

1. This type of tile is made from raw materials for production, which are not difficult to obtain in PS
2. Such a tile does not require special production areas (it is possible to start production in an area of one hundred square metres).
3. The manufacturing process for this type of tile does not require a large number of skilled workers, and the productivity of the operator ranges from 60 to 100 square metres per day.
4. The manufacturing process can be carried out manually by a simple hand-press, or can be produced automatically on a large scale.

This kind of flooring has the same physical elements of traditional PS floor tiles, as the contractors have acknowledged their durability since ancient times. Although this type of universal flooring tile does not have the same design and colours of a traditional PS flooring tile, it has been produced in the same size and durability and has the same installation methods. Thus, it does not require new skills or knowledge to fit it. Furthermore, it is faster and easier to produce (does not require high skilled workers) and also much cheaper (Amiry & Soboh, 2000).

In the contractors' view, these materials can serve the vast majority of their projects and can be used in every place, indoor or outdoor (Figures 50 and 51). These materials do not need – in their opinion – the maintenance work over a long period that may extend to 15–50 years and it is also easy to clean by mopping. They have become readily available in the domestic market with a low price, and the availability of local expertise required for installation and maintenance in time of need have contributed to their wide use

These beliefs in interior structure should raise some questions that local Palestinian architects should attempt to answer before installing such flooring materials in their projects, which are related to educational buildings such as KG. These simple questions are:

- Is it available in different colours, shapes and textures?
- Is it easy to clean and soft enough in case children fall on it?
- Is it resistant to slipping as well as water?
- Is it comfortable to walk and play on?
- Is it cold and heat-insulated?
- Is it sound-insulated?
- Is it suitable to be used indoor and outdoor?
- Is it suitable to be used in: classrooms, lavatories, store areas, offices and KG kitchens?
- Is it interesting for children at KG age?
- Is it eco-friendly?
- Can this sort of flooring reduce noise and eco factors?
- Can this type of flooring serve the purpose for which it is installed in the KG?
- Can this type of flooring support the learning environment in the KG?
- Can this type of flooring reflect the PS environment and culture?

By answering all the previous questions, the local architects should be aware of the importance of starting to look for some alternative flooring materials that at least can give positive answers for the majority of these points.

In general, even if the educational infrastructure has money and time allocated in order to establish some modern schools or KGs when they are fully funded by international or independent organisations, the decision makers, who are usually local engineers and authorities, do not use interior design science. Hence, cost is not the real reason behind this ignorance, at least in this case, although it is often used as the main excuse. The lack of awareness of the importance of applying the interior design knowledge in KG facilities could be one of the main causes that can clarify this ignorance.

**Reasons for the avoidance of using interior design in Palestinian KG (floorings as an example) can be explained from two aspect below:**

**A) First, popular tradition and KG buildings**

It is assumed that Palestinian decision makers do not use interior design knowledge in their educational facilities (in order to serve and support the educational aspects) because it contains defects, disadvantages or unrealistic aims but it is not used because they believe that interior design is limited to most developed countries, or at least it is limited to rich people. Therefore, interior design is considered a luxury. They see any extra cost or work towards applying interior design knowledge as a waste of precious money, which will increase the budget of the project and the future tuition fees that pupils' parents have to pay. In addition, there is a lack of awareness among the decision makers as to the vital role that interior design can play in the learning environment.

In addition, it is assumed that the root of the problem might relate to many years ago, to the way that KGs were established and run in PS in the last century, when KGs used to be just a room or two and held in one of the regular houses. According to Thorayya Hamadneh, who is a daughter of one of the first KG teachers in Asira Town in 1960s, KGs used to be run under one teacher’s supervision, who was often assisted by his wife to manage the KG. In addition, these buildings were divided to serve two aims, as classes in the morning and as normal houses for their landlords and their families after KG hours. In their KG the classroom used to be changed every day after class hours to become a guestroom or a bedroom for the family members. At that time, poverty was widespread among the general public. The KGs had simple components, which are not much different from any ordinary house in the region, except that they had a spacious surrounding garden used for children's play. These KGs were considered a private business, so parents used to pay for their services, because the local governments in PS (Ottoman, Jordanian, Israeli and PLA rule) did not fund KGs. Thus, they had been running as a private business in regular houses (Hamadneh, 2010).

It can be concluded that Palestinian people studied in such KGs, which are not so different from their traditional houses, although their traditional houses nowadays have changed a lot in their shapes, materials, dimensions, and types of doors, windows and flooring since the 1920s to 1960s.

**B) Second, the lack of awareness of the importance of interior design and the role that designers may play in their local society**

Although interior design in PS is not considered a new area of knowledge, because the Fine Art School, opened in 1993, includes the Department of Interior Design, the majority of Palestinians are not aware of the role that designers can play in their daily life or the fields or gaps that the graduates of this department can fill. Local people believe that interior design graduates are only fit to be school teachers or carpenters in workshops. Nor are local architects aware of the importance of this knowledge in their projects or the gap that it can fill.

Actually, the majority of the graduates of the Interior Design Department look forward to working in the education field as fine art teachers at schools, because the other choice for them is to work as graphic designers or if they are lucky enough they may find a vacancy in one of the Gulf countries. Otherwise they have to find another career such as in sales or agriculture. A few of the top graduates could find a place in architectural offices, if they are highly skilled, to work on some specific computer programs, such as MAX, MAYA or 3D AutoCAD.

Therefore, how can it be expected for those people to use what they do not know, when they are not aware of its importance or the role that it could play to improve their environment and lifestyle? Unfortunately, the Palestinian decision makers are not ready today to hire them where they should be or pay to them what they deserve in order to live a decent life. Even those who are considered well-educated people from the decision makers in PS do not use specialists in interior design when dealing with interior design issues, but they readily ask for help from architects, even structural engineers, to solve their interior design problems. This occurs because they are psychologically ready to accept engineers' advice and guidance regardless of the associated financial burden. In the Palestinian culture doctors, engineers and teachers are highly respected and appreciated among their society from the perspective of popular cultural and heritage, while artists, which interior designers are considered to be, come at the bottom of the cultural prestige list. Artists in the perspective of the majority of the local people are considered to be lazy and obsessed people who are wasting their time playing with colours and painting; they also think artists should find a 'real job' if they would like to be more respected in their society (Odeh A. , 2010). As a result of linking interior design knowledge to fine art knowledge, it is not easy to find a place in Palestinian culture. However, it is expected for this situation to change sooner or later because there are some signs that explain these expectations and support this vision. For example, the interior design graduates will be messengers who change the predominant view, starting with their parents, relatives, neighbours and their close communities.

Interior designers will someday be considered the key to the change in their lifestyle and improvement of their close environment. There is no doubt that the education sector will experience positive effects by this transformation, and the Palestinian KG will start to gain the benefits of this knowledge. However, this will not start until the local community and decision makers change their attitude towards 'artists' and respect what they aim to achieve.

In general, the lack of awareness among the majority of the Palestinian people of the importance of interior design on their daily lives is considered a more important and influential factor than the lack of financial support towards developing this vital sector. This leads to the role of the state institutions concerned in this field, who should work to educate both KG owners and staff involved in this vital sector. It has been seen how money alone afforded without awareness may be misused or may not be used dynamically. This may lead to the wastage of public money and the opportunities which could be afforded by the international community. Therefore, the first step towards applying any future licensing requirement must start from the education and the preparation of appropriate plans that enable a wide range of people to receive these requirements and applying them with full conviction. Schools could be a good place to start from, which will enable a wide range of young students from all classes to recognise the importance of the interior design knowledge and its role in the lives of human beings.

### 3.2.3. The impact of a high birth rate on the KG enrolment rate

This section will focus on clarifying one of the internal obstacles that has a negative impact on the KG enrolment rate in PS. This obstacle has a direct relationship with the prevalence of poverty, and is the high birth rate in PS. Thus, this study will present the relationship between the three previous elements because of their influence on the non-compulsory KG stage in a society already suffering financial difficulties (Figure 53).

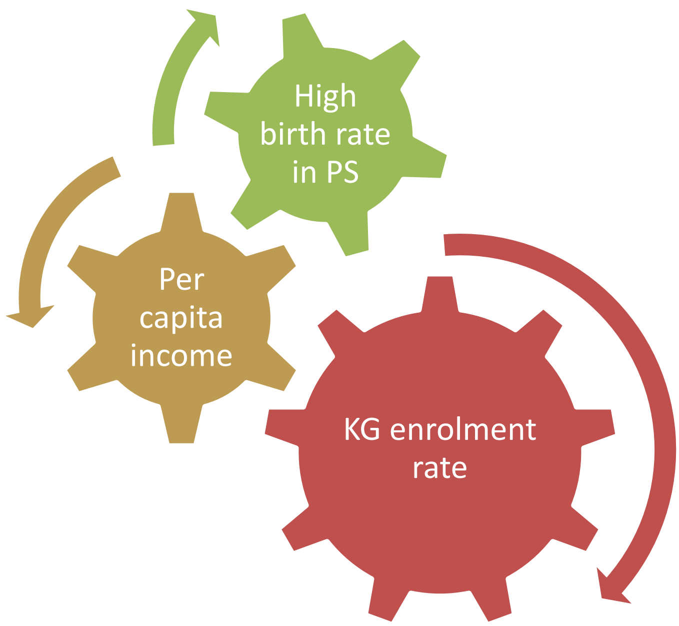



**Figure 53: The above figure illustrate the relationship between the high birth rate in PS and the KG enrolment rate**

According to the PCBS, in October 2004 children aged less than five years in the second quarter of 2004 in the Palestinian territory were estimated to comprise 17.6% of the total population, distributed as 16.7% in the West Bank and 19.1% in the Gaza Strip (PCBS, 2004, p. 17). Children are considered the biggest losers in this crisis because they are the weakest link.

PS has a high birth rate, of 6.4 members per family, of which the vast majority were among poor citizens, in 1997, and 5.8 in 2009 (Figure 54). Unfortunately, less money means more children in PS; this does not give the majority of poor families an equal chance to register all their children in KGs, which are not free and are run as a private business. In addition, charity KGs are less common and can accommodate limited numbers of children every year. The PCBS says that 46% of the Palestinian population is under 15 years old (PCBS, 2010).

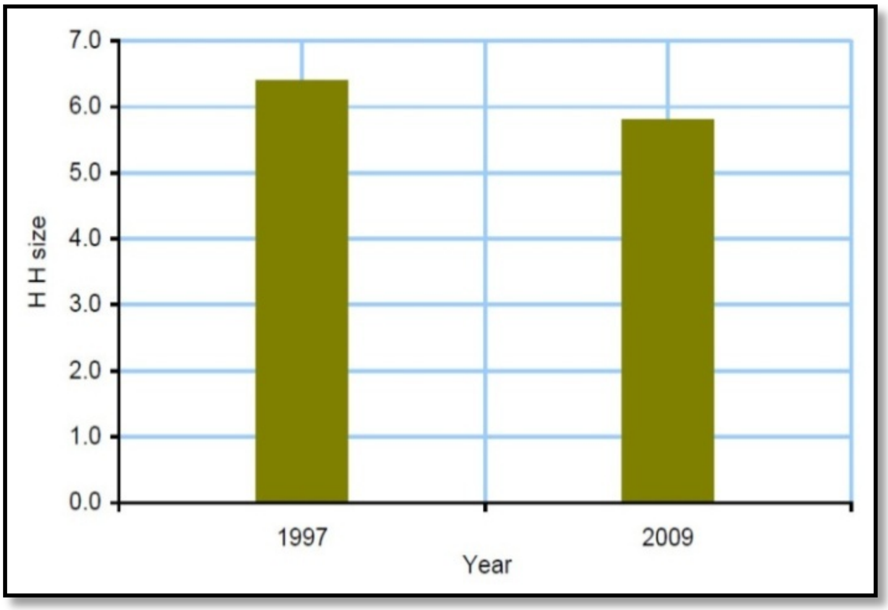



**Figure 54: Average household size in 1997 and 2009 (PCBS, 2010)**

Because of the existing budget deficit in the PA since its establishment, KGs not being included in the financial support of the local government, deepening poverty among the Palestinian people, the large number of members per single families, the high number of children in the population and the limited resources of families that often run the majority of

KGs, investors in the education sector of private KGs establish and run facilities that can provide low-cost tuition fees for their customers (pupils' parents).

### 3.2.4. The problem statement

The lack of awareness among the Palestinian decision makers toward KGs, the need for low-cost KG facilities with low running costs, quick profit-making, the widespread administrative and financial corruption within the PA with no legal provisions regulating the construction and operation of KGs or refurbishment of old buildings when being converted for KGs, and the weak supervision of local councils, have led to a lack of most KG facilities covering conditions of public health and safety. Quick profit-making often conflicts with safety rules and public health, and can impact on the main educational aims of foundation KGs themselves. There is no doubt that not applying the minimum requirements of establishing safe, healthy, accessible, enjoyable and interesting facilities in most Palestinian KGs has led to creating unsuitable learning environments for children to grow, learn, create and develop. This explains the importance of taking quick steps towards offering and then approving a 'guideline for licensing Palestinian kindergarten facilities', which could address many of these problems by taking into account the importance of suitability and, at the same time, each of the special needs of KGs in the Palestinian territories and the needs of the Palestinian child in his or her environment.

## Palestinian children's needs, concluded from the key factors

**Addressed by architecture and re-designing buildings, and regulations of licensing KG buildings in PS:**

| | |
|---|---|
| 1. Feel physically safe<br>2. Feel emotionally safe | • Healthy and safe learning and playing environment |
| 3. Move away from thinking of war and its consequences<br>4. The sense of freedom of choice | • Free access<br>• Easy to access<br>• Free play<br>• Create fun, interesting and attractive places |
| 5. As far away from the constraints and limited mobility as possible | • Open outdoor spaces<br>• Fewer barriers<br>• Free movement<br>• Strong relationship between in/out |
| 6. Granting children the feeling that they could have control of things around them<br>7. Educating them to try to reach for success | • Choices to learn, move, play and act<br>• Create an environment that helps them to rely on themselves and be more independent |
| 8. Take into account the economic situation of their families | • Create economic and quality learning environment |

**Figure 55: The above figure shows the points required to be focused on through developing the interior learning environment of PS KG. These points are based on children's needs, difficulties and problems in PS.**

## 3.2.5. The future phases

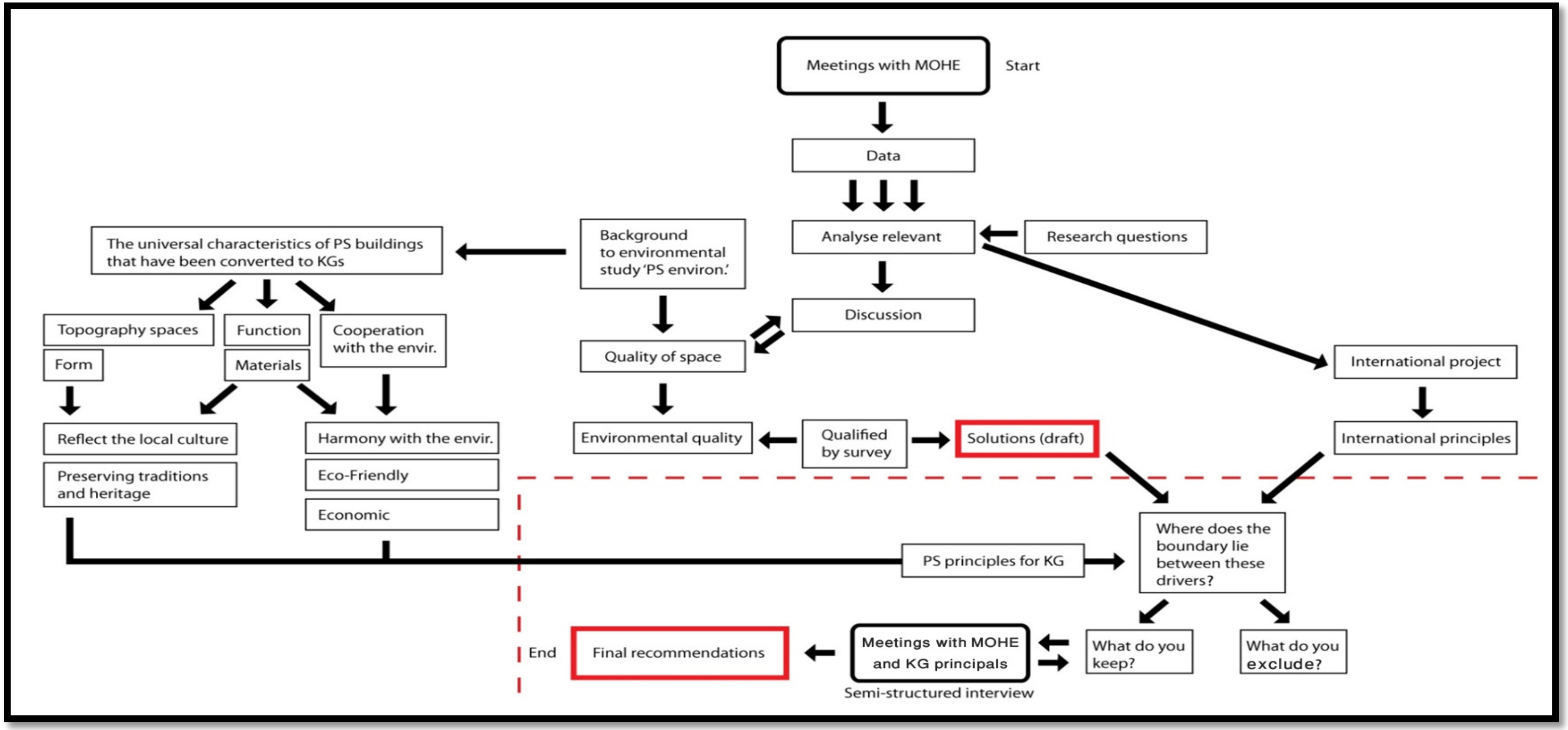



Figure 56: The above drawing shows the following future stages in the search, since held meetings with the MOHE until the exit of final recommendations of the study

# Chapter 4 : INTERNATIONAL PROJECTS

### International case studies about KG buildings from different countries

The case studies will be divided into two sections: the first section will present the mechanism of licensing KG buildings in the most developed countries in this field. This study will cover three countries: Japan, Austria and South Africa. This will explore the contemporary patterns developed for KG classes in these countries. This part of research contains international samples from previous field studies of KG buildings (Japan, Austria and South Africa), in which each one of them has established a deep understanding, whether at the level of interior design, the importance of the surrounding environment, or the reflection of heritage and the local culture. It aims to conclude from their experience what might be developed later to be used in the study area, and also for studying the feasibility and significance of applying them in PS by taking into account several factors including the economic situation and the needs of both children and KGs in PS.

The second section of this research will include the field study, which will focus on some case studies in the Palestinian territories. It will identify the mechanism of their work and the conditions and laws in place to license their educational facilities, if any. The field study will target some KG facilities in the West Bank[15] to work closely to identify the main problems and challenges that they may face by drawing some layouts for their buildings. Then, these will be followed by some meetings that will be held with the parties concerned, which are the MOHE, KG landlords/teachers, and parents.

[15] Please see the boundaries of the study area

## THE FRAMEWORK FOR INTERNATIONAL CASE STUDIES

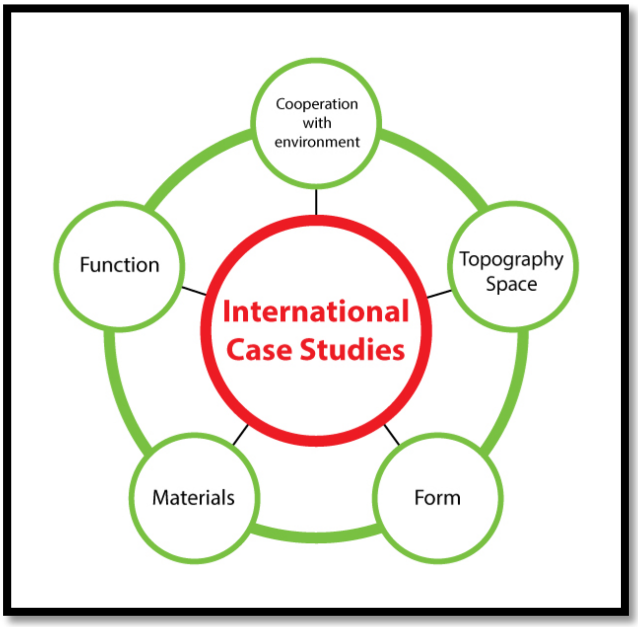



Figure 57: The framework for international case studies

This framework will be applied for:

1. Japan
2. Austria
3. South Africa

## 4.1. THE FIRST INTERNATIONAL CASE STUDY, FUJI KG (JAPAN)

### The importance of Fuji KG as a case study to the research

The Japanese case study is important to this study because, although there are many clear differences between Japanese and Palestinian cases in terms of income level, geographic location, political stability, technology and financial resources for funding large schemes, both of them share common problems related to the freedom of movement, the need for open spaces and the lack of land for construction (regardless of the reasons and the justifications of each one of them). In addition, both of them are very proud of their heritage, culture, and traditions that they have shown in their construction. Both of them keep an eye on the importance of reflecting their deep culture in all aspects of their daily lives, and their houses and educational facilities are on the top of their list.

This part of the research will show how JP KGs address their own problems and difficulties in modern ways by keeping an eye on their valuable principles, from which PS KGs can learn. This study will show that culture is not limited to traditional ornaments, colours or engraving but it can also be held in the principles of design. Moreover, this case study will show that the use of modern methods of construction to address local problems does not mean moving away from the use of natural raw materials or being ignorant of the local culture as well.

## 4.1.1. Japanese (JP) buildings

### 4.1.1.1. JP building typography

According to the Statistics Bureau in JP, the average interior space of JP houses has jumped from 70 $m^2$ in 1973 to 92.4 $m^2$ in 2008 (Table 8). Moreover, typical JP houses in the capital have approximately 3.9 rooms whereas in the countryside it is 4.7 rooms for each house. In addition, the floor space in Tokyo today is 66.8 $m^2$, whereas it is 111.67 $m^2$ in the rural areas. The majority of JP families who live in cities are living in flats. Houses in both the JP countryside and cities are built close together, with a kind of fence for privacy. JP people prefer to spend more time outside their home than Americans, because the interior spaces of their homes are very small or even overcrowded. As a result of the small size of JP houses, families generally meet their friends outside their houses such as at restaurants or pobs (Hays, Homes in Japan, 2011).

#### A) Rooms

Typical JP rooms are very small, especially the bedrooms. Almost all JP houses have tatami mat floors. In general, the combination kitchen and dining room has a small low table and might also have some seats. However, because of the lack of space in such rooms it is unusual to see a sofa or couch in such spaces, or even a coffee table. However, the Japanese are very good at using such limited space. *Mottainai* is a Japanese word that means a wasteful use of space. Even rich JP families have to design their homes to fit on small plots of land. The high cost of owning land is a real problem, especially in cities like Tokyo, where a house (400 $m^2$) in a quiet neighbourhood can cost six million U.S. dollars (Tanikawa, 2010).

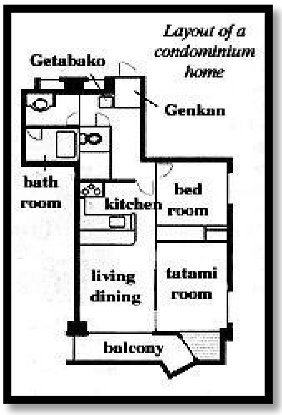



**Figure 58: Layout of a condominium home (TFJ, 1997)**

| Year | Total households | Total number of dwellings | Occupied dwellings | Ownership | | Dwellings exclusively for living | Floor space per dwelling (m2) |
|---|---|---|---|---|---|---|---|
| | | | | Owned | Rented | | |
| 1983 | 35,197 | 38,607 | 34,705 | 21,650 | 12,951 | 31,935 | 81.6 |
| 1988 | 37,812 | 42,007 | 37,413 | 22,948 | 14,015 | 34,701 | 85.0 |
| 1993 | 41,159 | 45,879 | 40,773 | 24,376 | 15,691 | 38,457 | 88.4 |
| 1998 | 47,255 | 53,891 | 46,863 | 28,468 | 17,166 | 45,258 | 89.6 |
| 2003 | 47,255 | 53,891 | 46,863 | 28,666 | 17,166 | 45,258 | 92.5 |
| 2008 | 49,973 | 57,586 | 49,598 | 30,316 | 17,770 | 48,281 | 92.4 |

**Table 8: Housing conditions (Statistics Bureau, Japan, 2008)**

**B) Form**

A typical JP house consists of one to two storeys. It is divided into two sections – one for living areas and the other for the kitchen, bathroom and lavatory. There is no underground storage or even an attic. The roof in JP houses is just a tiled roof over the top of the building.

**A) Simplicity**

Japanese believe in simplicity in their life. They are to the contrary of western styles, where home decor may look too ‘busy’ or even be too incompatible to make them feel relaxed. The Japanese prefer natural colours and look for organic fabrics and natural colours, which can be seen in the Asian style. JP houses’ patterns and style of furniture can do a lot to relieve stress and create a comfortable and quiet environment. These days, there are many international interior designers who prefer using the JP style in their schemes. They are inspired by the JP concept of design and apply its lines and colours in modern design projects around the world. Thus, it will not be surprising to see this style in modern design projects in some furniture in hotel lobbies, restaurants and office spaces because it creates a sense of a peaceful and quiet environment (Chopea, 2010 ).

According to Heinrich Engel (Engel, 1998) the JP concept of simplicity of design and the multifunctional usage of furniture and space, which is transferred from the traditional understanding of life, could create today endless possibilities for any modern living space. For instance, JP bedroom furniture, a low profile Tatami platform bed and matching furniture, opens ups the space in the room and makes it more relaxing and comfortable on all levels (Chopea, 2010 ).

Western architecture attempts to create vertical features that can appear to embody the power of God and mankind over nature, whereas JP buildings such as temples usually stress the horizontal. The size of these buildings is often quite small and JP architecture tries to hide them with natural objects like plants and trees for quiet and privacy.

JP designers prefer simplicity in design, unlike Westerners who try to use unnecessary additional elements to decorate their building. JP architects focus on making their structures beautiful but mysterious at the same time.

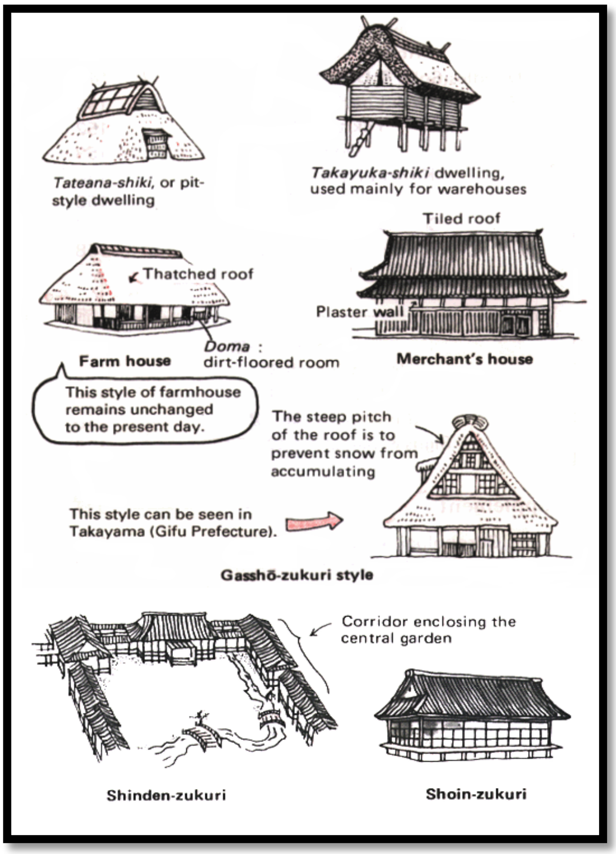



**Figure 59: Traditional houses in Japan (JNTO, 2000)**

The main unique feature of the traditional JP house is the way in which the house is open to nature. They use natural material in their main structure of wood, earth and paper. In addition, the construction pattern itself spreads out horizontally rather than vertically.

#### 4.1.1.2. Materials

There is no doubt that austere construction methods, lightweight natural materials and porous boundaries between inside and outside are considered the main features of traditional JP architecture (BBC News, 2010).

Pritzker-prize-winning Japanese architect Ryue Nishikawa says:

> “If you see Japanese temples made of wood, you can see how the architecture is made up. They have a clear construction and transparency and they are quite simple, while Western architects would battle the elements,"
>
> (Hays, Japanese Architecture, 2009)

Historian Daniel Boorstin wrote in The Creators

> "The Japanese, admiring their power, have sought ways to exploit their charms."
>
> (Hays, Japanese Architecture, 2009)

Over the centuries, architects in western countries have chosen strong and resistant building materials such as stone, which was important for them to control nature and to produce tall and enormous structures such as high-towers. JP architects tend to be more in harmony with nature. Therefore, they choose timber as their main building material. This philosophy of building still affects JP building, as the majority of temples today are made of wood.

According to a 1993 study (Hays, Homes in Japan, 2011) about 46% of JP houses were built with wood, 31% from fire-proof wood, and 22.5% of other materials. Today, traditional JP homes are made of wood and have ‘*tatami*’[16] mat floors, sliding ‘*shoji*’ doors, wooden walls, a tile roof, lath-and-plaster walls, and ‘*tokonama*’ [17].

---

[16] A kind of JP floor covering, which is made of approximately five centimetres of thick pressed straw
[17] Futon are traditional Japanese beddings

#### 4.1.1.3. Function

Both sliding doors and sliding walls are a JP invention. Traditional houses have heavy paper sliding partitions, which are used to divide the house. These moving partitions can be pushed wide open or removed to create more space. Some JP homes have thick walls for winter, which can be replaced later with thin ones for summer usage. Windows facing the outside are often glazed, but they usually have curtains for more privacy (Hicks & Hicks, 1989).

**Flexible houses**

Traditionally, JP homes have not had permanent living or bedrooms. Instead, rooms have been arranged as needed around the kitchen, bath, and toilet rooms using sliding panels. For this reason, furniture in other rooms is often portable and pieces like futon mats can be stored in house closets, as needed (Jie, 2011).

Traditional JP homes are multi-purpose as it is easy to change their rooms. For instance, bedrooms are easily converted to sitting rooms and play rooms at the same time. The average size of a JP dining room in a small apartment is approximately 3.3m by 4m. Usually, at the centre of the room there is a low table, which JP family members sit around for having dinner.

Japanese families spend their time at home on traditional floors called '*tatami'*. The majority of JP people consider this sort of traditional floor quite comfortable for sitting down and even for sleeping purposes. It should be pointed out that the average size of JP bedroom is almost equal to the size of a large American walk-in closet. A typical JP two-bedroom flat has one bedroom for the children and a smaller one for the husband and wife. Although the typical children's bedroom in such a house is very small (3.3m x 3.3m), it is often packed with two desks, a dresser and a child's bed. Thus, many Japanese do not sleep on beds. They sleep on futons placed on a tatami mat floors. In general, these futons are rolled up each morning and placed in a hidden cupboard to create more room inside the flat (Hays, Rooms, appliances and furniture in Japan, 2009).

Today, typical JP flats are heated with small gas heaters, which are plugged directly into the wall. It should be pointed out that in winter many JP houses are too cold. Thus, people have to wear sweaters and heavy clothing inside their houses.

#### 4.1.1.4. Cooperation with environment

‘*Nihon teien*’ is a garden in traditional JP style. This sort of garden can be established outside private houses, in neighbourhood parks, and at historical places such as temples and castles. According to Seyemon Kusumoto, who is a landscape gardener, the Japanese generate ‘the best of nature's handiwork in a limited space’ (Vincent, 2008). JP gardens have a high reputation not only in Asian counties but also in the West. Dry gardens as well as rock gardens, ‘karesansui’, occupy a prominent place in this world. The JP garden is a kind of high art that reflects the beauty of rural simplicity. It is linked to the arts of calligraphy and ink painting. However, since the end of the 19th century, Japanese gardens have also been adjusted to Western settings.

According to Lara Blanchard (Blanchard, 2008) and Derek Clifford (Clifford & Eckbo, 2008) Chinese gardens have had a great impact on developing the characteristic of JP garden style. In general, the secret of this kind of art was passed down from one generation to another within the same art gardening school. The opening words of Zōen's Illustrations for designing mountain, water and hillside field landscapes (1466) are: ‘If you have not received the oral transmissions, you must not make gardens" and its closing warning is "You must never show this writing to outsiders. You must keep it secret” (Slawson, 1991).

#### A) Typical features in JP gardens

The main features of the ‘typical’ JP garden may be noted without investigating deeply the aesthetic underlying Japanese practice and its background. Typical JP gardens are located at the centre of a JP home from which the garden is viewed. In general, the JP gardens contain some of these features (Vincent, 2008):

1. A teahouse or pavilion
2. Water (real or symbolic)

3. A bridge over the water
4. Stone lanterns
5. stepping stones over the water
6. An enclosure device, for instance, a fence or hedge
7. Rocks or stone arrangements

**B) Bringing outside in**

JP designers use wide sliding doors, which open widely onto a JP traditional garden or a natural view, to link the internal spaces with the surrounding environment. They use sliding doors to break the barriers that normal walls can create (Figure 60). Moreover, these sliding doors are made from natural material such as paper, wood and glass, which make a JP house comfortable even in hot seasons (Clifford & Eckbo, 2008).

**Figure 60: Wood and paper houses go well with nature. Photos by Joi Ito and B Balaji**

There is no doubt that paper sliding doors are an important feature in any traditional JP house. During the day the room is used as a living and dining room, but it is converted at night to a bedroom with futons[18].

[18] A sort of JP bed or (mattress)

## 4.1.2. JP culture in houses

### 4.1.2.1. No chairs

JP architects have to raise house floors by a few inches in order to avoid humidity from the ground. Rooms where people sleep or sit like the living room, are covered with a ‘tatami’ floor. These mats are made from woven rush grass. The Japanese generally do not use chairs on top of them. Thus, they sit directly on the tatami or on flat cushions called ‘*zabuton’* (Figure 61). This is can clarify the main reason why JP people take off their shoes when entering their traditional houses.

**Figure 61: *Zabuton* and dining table (Japanese form), photo by Kohakuan Machiya Residence Inn, Kyoto.**

### 4.1.2.2. Shoe removal policy

People in JP have been removing their shoes prior to entering a home (Figure 62) for over a thousand years to leave dirt outside, figuratively and literally. This is not just a casual house habit; it is also sometimes written into rental contracts that shoes will not be worn in the apartment. This is part of culturally ingrained mores. The main reason for taking shoes off is to keeps the floor clean. Maybe that is why the Japanese do not hesitate to eat and sleep close to the floor.

In recent studies at the University of Arizona (Leamy & Weber, 2008) when researchers tested people’s shoes, some interesting facts came to light:

a) They found nine different species of bacteria of the type that can cause infections in the stomach, eyes and lungs.

b) They found that bacteria live longer on the soles of shoes than in other places. This is because as we walk we constantly pick up new debris that feeds the growth of more bacteria

c) They found that children under two years old are the most vulnerable to this bacterium because they play on the floor and put their hands and other objects in their mouths an average of 80 times an hour.

d) They found that the majority of bacteria contained coliform that comes mostly from human and animal waste.

At JP schools students remove their shoes to wear another pair of inside shoes. In each JP school there is at least one big cupboard with shelves that is usually located at the entrance or the hall area. For instance, in the Tokyo metropolitan area a changing footwear policy is the rule in all schools, since there is an assigned cubbyhole for each student. Shoes are not only removed in schools, but also in holy places or traditional places such as shrines and Buddhist temples. In addition, this policy may be followed in some clinics, hospitals, and Japanese-style restaurants. However, shoes are worn in university buildings as well as in most business offices (TFJ, 1997).

**Figure 62: There are no janitors/custodians in public Japanese schools. The cubbies are for outdoor shoes. Each student has a pair of shoes dedicated for indoor use.**

### 4.1.3. Problems in Japan

#### 4.2.3.1. The high cost of lands and buildings in the cities

The plots of land prices in the central capital are increasing rapidly, whereas those in smaller cities are falling. For instance, the average cost of buying one square metre of land in central Tokyo is 107 times higher than the cost of a square metre in the city of Maebashi. The cost of property is so high as a result of government regulations and tax laws, which discourage an active property market.

However, the Japanese deal very well with small and limited spaces. '*Mottainai'* it is a word that has been invented by the Japanese, which means a wasteful use of space. As a result of the lack of space and its cost, even rich JP citizens have to adapt their design for their future dream houses to fit on small plots of land (Tanikawa, 2010).

Traditional Japanese architecture is beautiful and amazing. Often built with large wooden members, ornate design, and curved tile roofs, these buildings are recognizable to most, even those not very familiar with Japan and its history. These beautiful buildings are masterpieces built over the ages, but there lie within some major problems that only surface during times of unusual stress on the buildings. One such time was on 11 March 2011 when an earthquake struck off the coast of Japan (Schulten, 2011).

#### 4.2.3.2. Earthquake

Thousands of people died, and many more thousands were injured. Many were shocked and couldn't understand why there was such catastrophic failure in the wooden buildings in Japan. Wooden buildings are often praised as being more earthquake resistant because they are able to withstand minor flexing and movements while concrete (the most common alternative) typically cracks and suffers major damage due to the fact that it can't bend at all without being damaged. Of the 55,000 buildings that completely collapsed and the 32,000 buildings that were partially ruined, nearly all were made from the traditional wooden architecture (Dougherty, 2009).

Tile in a bed of sand is used for roofing in Japan in many places both traditionally and currently. The weight ratio of the tile and sand roof compared to the wooden walls is similar to putting a small book on top of a house made of playing cards. It can be seen that there is too much weight on top. This kind of roof just a little bit instable under pressure on the walls and the building with the weight on top would fall (Tobriner, 1997).

The earthquake and the destruction it brought were astounding, and even more so because Japan had claimed to have designed so much to be earthquake proof. While the beauty of Japanese architecture is known around the world, it needs to be carefully modified so as to prevent disasters and maintain their integrity even under above normal stresses.

**In brief**

1. Inadequate plots of land are allocated and licensed for construction
2. There is a high cost of plots in cities
3. There is a lack of spaces in Japanese houses, especially in the cities
4. There are limitations on the visual horizons and limit the extent of visibility of crowded areas
5. The small Japanese flats have a lot of barriers that do not allow for free movement for children
6. Building earthquake resistant structures is a constant challenge

### 4.1.4. Japanese children's needs

Generally, the Japanese children's needs are related mainly to the following points:

1. Barrier-free KG
2. Freedom of movement
3. Natural grounds which allow children to play freely and express themselves in a large open space

Children need outdoor spaces as well as indoor spaces to play in. Outdoor places include playing fields, gardens, sports areas and swimming pools (Dudek, 2005).

### 4.1.5. Japanese educational system

Japanese people value education and they believe that education is the best way to achieve self-improvement and to reach a successful career. JP claims a 100% literacy rate (percentage of the population who are able to read and write) (Statistics Bureau, Japan, 2011).

According to Richard W. Riley (Riley, Takai, & Conaty, 1998) after World War II, the Japanese school system was changed to look a lot like the American school system. Today, the academic year begins in April and ends in March. Japanese children begin kindergarten at age four and elementary school at age six. Students are in six years of elementary school '*shougakkou'*, three years of junior high school '*chugakkou'*, three years of senior high school '*koukou'*, two years of junior college (*tankadaigaku* or *karejj*) and four years of university '*daigaku'.* Elementary and junior high school are mandatory in JP. High school and college both require rigorous entrance exams, but around 95% of students choose to enrol in high school. The proportion of male students is higher at universities, while the opposite is true of junior colleges (Educationjapan, 2001)

Primary education stresses basic skills such as reading and maths. It seeks to develop the individual into a socially responsible group member. In general, teachers in these educational facilities focus on building strong relationships with their pupils. Thus, children often find early education an enjoyable experience.

**4.2.5.1. Japanese KGs**

KGs, ‘yochien’, in which the majority of its staff consists of young female junior college graduates (Educationjapan, 2001), are overseen by the Ministry of Education. However, they are not considered a part of the official education system. Beside KGs there are day-care centres, which are called ‘hoikuen’. In general, ‘hoikuen’ are concerned with providing care for infants and toddlers. The difference between them is that ‘hoikuen’ are supervised by the Ministry of Labour whereas ‘yochien’ follow educational goals. Similarly, KGs ‘yochien’ facilities may be run as public or private educational facilities. Approximately 90% of children enrol in one of these kinds of preschool facilities before entering the formal education system in JP schools. The current government aims to raise the number of KG facilities, which will enable mothers to work if they need or want to (Chesky, 2011).

According to Mark Warschauer (Warschauer, 2010) compulsory school in Japan begins in first grade at the age of six, whereas in the USA children have between one to two years of compulsory preschool before they start KG, which is considered a compulsory stage too. JP children have two years of (non-compulsory) KG before they start (compulsory) first grade. Four-year-old children attend a special stage, which is called KG1, whereas five-year-old children attend another stage called KG2.

The JP school year starts in April. As it is mentioned, there are two education systems at the KG stage in JP, which are called “*yochien*” and “*hoikuen*”. A Japanese *yochien* is pretty similar in many ways to a US KG, which has a half-day of learning system. This system aims to prepare young children for the first year of formal educational system in first grade at school. One of the main differences is that there is so much reliance on the contribution of parents at this stage. It is the mothers’ duty to prepare their children’s box lunches every day (bento) and also to participate directly in the school experience. Conversely, *hoikuen* are established and designed especially for working parents. Therefore, they last all day and most of them provide lunch.  In contrast to *yochien,* parents are not expected to be seriously involved in the KG activities.

*Hoikuen* appears to be less academically oriented than *yochien*. Therefore, many parents may prefer *yochien* as they believe it could be better for their young children in order to prepare them for the competitive JP educational system. Both types of KGs exist in public and private variants. All JP KGs charge tuition fees, but public ones are funded and usually cost less. On the other hand, the *hoikuen* is very play-oriented, without focusing on academic or specific instructions. Mark Warschauer points out that in 2010 the tuition fees for attendance at a *hoikuen* KG usually cost approximately £135 a month for the first child, and £95 for the second[19]; the third child is free (Warschauer, 2010).

JP primary schools accept all children with disabilities but, since Japanese KG is not a compulsory stage, regular KGs have no obligation to accommodate all children with disabilities. In addition, disabled children are only accepted in KG on a space available basis. Each kind of JP KG only has limited space for a limited number for such cases. Thus, once that number is reached, the parents have to enrol their children (with special needs) in another early facility. Children are allowed to go to the preschools anytime from 9:00 am to 6:30 pm. However, it is expected that their parents will pick them up at approximately 5 pm.

**Figure 63: Fuji KG (DETAIL, 2008)**

**Figure 64: Kindergarten Students in Gunma Prefecture, JP (taken on October 11, 2008 in Tomioka-shi by Andrew Semansco)**

[19] Based on a two-child discount

#### 4.2.5.2. Goals and principles

According to R D Muth (Muth, 2009) in Japanese KGs there are no boundaries for movement and they are learning in a different way.

> "The basic ideal of kindergarten education is to understand the nature of children and to educate them through their environment. For this purpose, teachers must build a trusting relationship with their pupils, and create a good educational environment together with their pupils".
>
> (Hicks & Hicks, 1989).

The following points should also be emphasised:

1. Children learn through play
2. The development of a child's body and mind are connected
3. The child's mind and body develops in several different ways
4. Children knowledge things, which are important to their development, by showing their abilities in an emotionally secure environment. Thus, teachers have to work on creating an environment that can boost children's subjective behaviour

#### 4.2.5.3. The main goals of kindergarten education

Early childhood is a very important period, when children start developing their own foundation for life. A KG should provide this based on the following ideals and aims:

a) Help children learn to love and trust people.
b) Develop their individuality, independence, teamwork, and ethics.
c) Develop their curiosity in the things around them, such as nature.
d) Develop their feelings, and their ability to contemplate.
e) Teach basic habits, practices and attitudes that are necessary for developing a healthy, safe and happy life. This will be a vital issue to develop the foundation for a healthy body and mind.
f) Develop their interest in daily verbal expression.
g) Cultivate sensitivity and creativity through various experiences.

h) Develop their listening and speaking skills, as well as their understanding of the language.

#### 4.2.5.4. The relationship between JP pupils and their surrounding environment in KGs

This part describes the development of the ability to actively interact with the surrounding environment, such as nature and social phenomena, and the development of an attitude to include those things into their lives. Goals (Hicks & Hicks, 1989):

1. Voluntarily encourage them to interact with their surrounding environment. Include aspects of the environment in their daily lives, and value them.
2. Identify the surrounding environment. Encourage then to be more interested in various phenomena by making children closer to the nature
3. Develop the sense of nature and quantity of things by monitoring, thinking about, and handling the phenomena around them.

### 4.1.6. The case study: Fuji KG

**A) Background about Fuji KG, Tokyo**

The Fuji KG is located in Tachikawa, which is part of the Tokyo prefecture. Tachikawa is about 40 km west of the centre of Tokyo. The KG was built in 2007 by Takaharu Tezuka, who is a Japanese architect. There were 550 children enrolled in this KG in 2008, who were divided into 16 groups. The maximum capacity of the building is 560 pupils and the number of KG staff is 35. The construction cost was €1,540,000 (Table 9) (DETAIL, 2008, pp. 280, 332).

| | |
|---|---|
| The size of the building | Gross floor area 1,094m$^2$<br>External area (courtyard) 869m$^2$<br>Size of group rooms 110-325m$^2$ |
| The age of children | 3-5 years old |
| Others | Private owner and operators |
| Construction cost | €1,540,000 |
| Capacity | 550 children |

**Table 9: The above table summarizes the first international case study from Japan, Fuji KG in Tokyo**

**B) The general external view**

The roof of this KG has a unique style, which seems like an arena or a racetrack. The designer has not only aimed to create an open play area below the flat roof but also made the roof itself a playground. He believes that it will be great to be able to move around the roof.

**Figure 65 : The roof of Fuji KG in Tachikawa 1,608m$^2$, 2007 (DETAIL, 2008)**

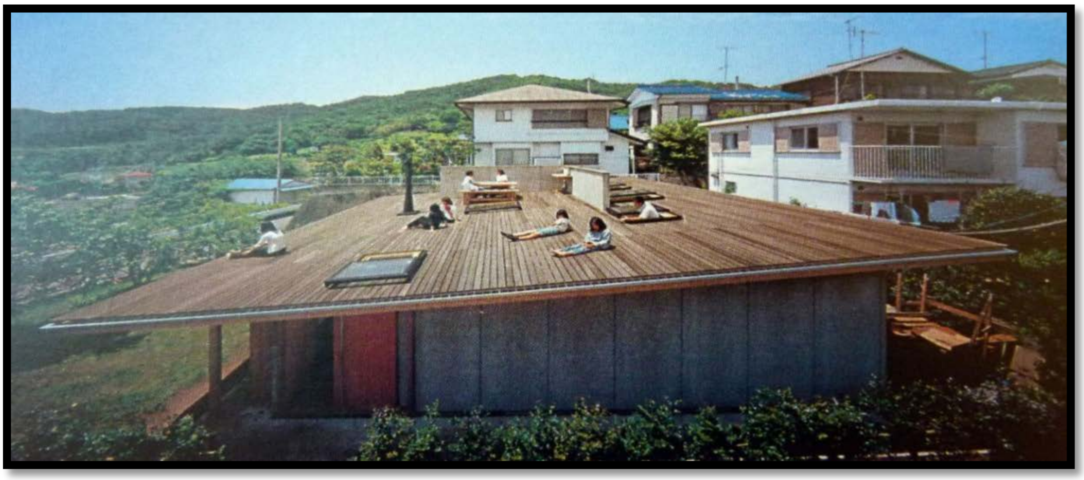


**Figure 66: 'Roof top house' by Tezuka architects in Hadano, 2001 (DETAIL, 2008)**

Tezuka wanted to create a building that has a minimum number of corners, and he also aimed in this project to make a space without dead ends. As a result he created a building with no hidden places, which some schools and KGs may consider problem places and troublesome spots for bullying and suchlike. There was a wide use of glass in walls and use of natural materials. Moreover, the Fuji KG reflects the Japanese traditions, concept and lifestyle in many ways that will be presented in this study; the design of the roof of the KG itself reflects one of them.

### a. The KG roof

There is no doubt that the Fuji KG roof is the most important characteristic of the building. The roof has been lowered to the legally permitted limit. The height of the classroom ceiling facing is only 2.1m, which is important for a child in order to view the roof from the outdoor play area. As a result of this, all events on the roof can be easily monitored and seen; even if children go further back on the roof, they will still be visible from the courtyard.

All 560 children can sit along the edge of the roof overlooking the interior courtyard, while their legs can dangle through the railings. The teachers in the courtyard can contact children directly from there and make a speech or even sing together. This strong mutual link can enhance the feeling that they all belong together.

### b. Handrail

The designer decided at the last minute to add this handrail to the top of the roof for safety, because the main idea was to create a typical roof for his last project (in Hadano, 2001) (DETAIL, 2008, p. 282), which reflects the Asian tradition of using the roofs of their houses for sleeping or sitting at the edges, especially in the summer season. However, to address the safety issue, transparent barriers were installed on the outer edges of the roof, and metal railings on the interior edges of the roof. The transparent boards at the outer edge enable children to overlook the surrounding environment, whereas the metal balustrade at the interior edge, which has spaces between its bars, enables children's legs to dangle through them while they overlook the interior courtyard.

The slender vertical railings have a maximum spacing of 11cm, which is too tight for a child's head, but the legs pass through easily. The edge of the roof is big enough for 450 children to sit round the rim, which is a pleasant experience for all children to sit like that and have the chance to look down.

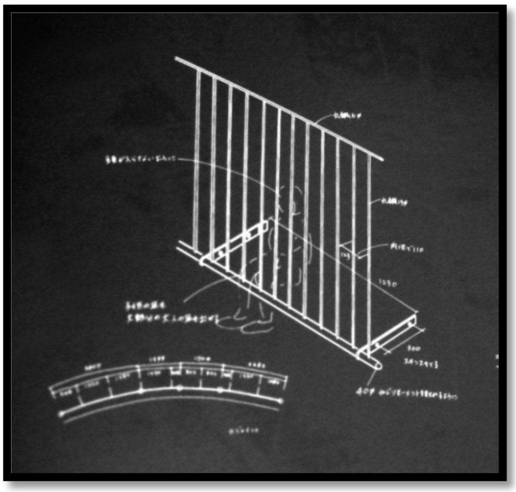
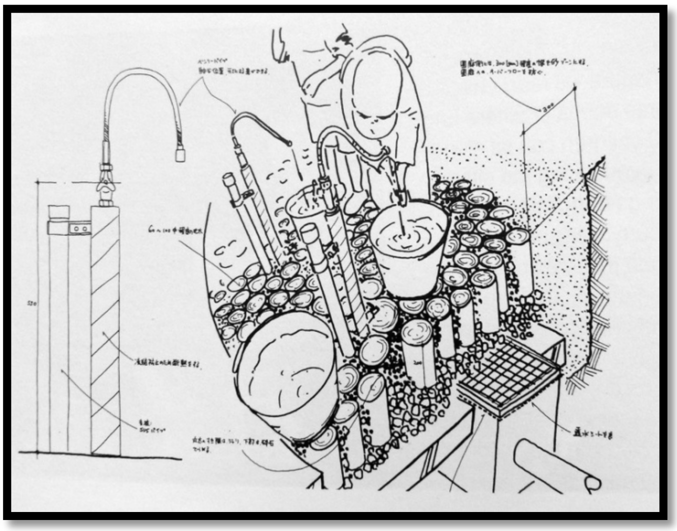


**Figure 67: Handrail that is installed on the KG roof (DETAIL, 2008, pp. 281,283)**

### c. The courtyard

The courtyard has been established to educate children by encouraging them to contact and deal with others, and also to help children to grow up through their own effort and encourage them to gain their own basic experience. The Japanese heritage is clear in the garden of the KG through using timber below the outdoor water taps in the courtyard; this is used to direct water spilled on the surface away from children as well as reduce the risk of slipping on the wet surface. The drainage outlets are visible only when one uncovers them because they are buried underground. Moreover, this prevents the common problem of drainage outlets becoming blocked by mud (Figure 69).

**Figure 68: The courtyard 869m$^2$ (DETAIL, 2008, p. 283)**



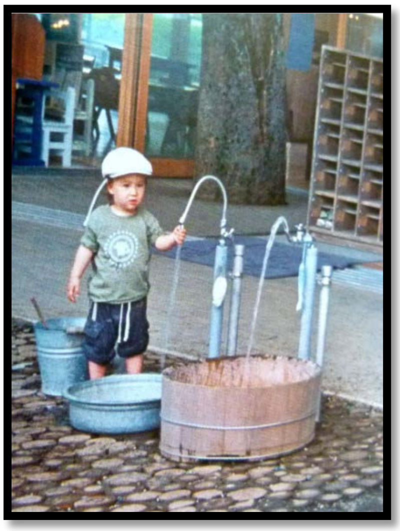


**Figure 69: The drainage of water, which may be spilled on the ground from the outdoor taps, by using pieces of wood also improves the slip-resistance of the wet floor**

### d. The shade and shadow

The circular form of the KG layout allows trees to be integrated into the layout of Fuji KG, which will serve the project later, and works to preserve the environment where possible. However, it was not easy to achieve because some of those trees stood in the middle of the project. Therefore, it was changed to an oval shape, which could exploit the site more efficiently. Openings were left in the roof through which trees can grow. The designer initially planned to surround the openings with about 1.1 metre high railings but then he decided to install nets around the tree openings for more protection for children (Figure 70).

- **Skylight**

Skylights open an indoor space to bright and natural light throughout the day (Figure 70). Installing them in the Fuji KG makes the building more environmentally friendly. In addition to the environmental advantages of natural lighting, skylights offer many other benefits to an educational facility and its community. Skylights help reduce the amount of electricity needed to light the KG, which reduces pollution from power plants as well as the cost of installing and running artificial lights. Moreover, skylights strengthen the relationship between inside and outside. A study conducted by the Heschong Mahone Group of schools (HMG, 1999) shows that natural lighting can enhance a learning environment and improve student performance.

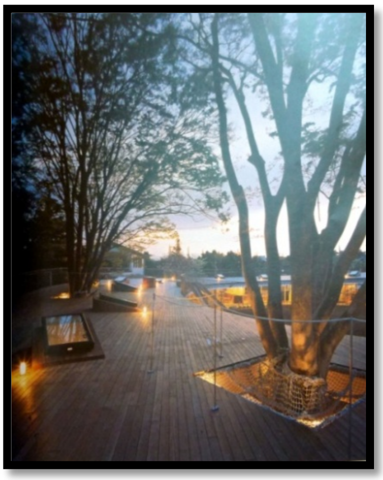


**Figure 70: Part of roof structure “skylights’**

However, the types of installed skylights and their locations at KGs should be taken into account because some of them may produce negative effects without any controls. They may allow direct sunlight into a room and cause a distracting glare.

- **Playing on trees**

KGs often start by planting trees as a way of building a landscape structure for other grounds greening projects or to create pockets of shade in and around play areas. Trees provide a fun and friendly environment where children can happily play and learn at their own pace (Figure 71). Trees are considered teachers and playmates; whether as houses for children or creative and spiritual inspiration for adults, trees have provided the space for human retreat throughout the ages. In addition, trees not only provide children with oxygen and clean air and reduce heat but also shield children from ultra-violet rays.

**Figure 71: Climbing trees on the KG roof**

Skin cancer is the most common form of cancer in the United States. Trees reduce UV-B exposure by about 50%. Therefore, providing protection to children on playgrounds, where children spend hours, should be a priority for any KG.

However, later in this research, it can be seen how some PS KGs have in some cases chosen the wrong plant for the wrong sites (Page 252). It is important to understand the site conditions and the potential impacts of plants on the children's activities.

## C) The general interior view

### a. Furniture

Paulownia wood has been used in the KG furniture, which is a very light wood. Thus, it is easy for it to be moved by the children themselves. The majority of the furniture is made of soft materials and all corners were also rounded to a radius of 5mm to avoid injuries as well as broken edges.

### b. Lighting

The KG depends on natural light as the main source for the interior spaces, but industrial lighting cannot be disposed of altogether (Figure 72). Thus, lighting is not only provided here by bulbs, but also naked bulbs have been chosen in this project. Although the fluorescent strips may be brighter and have a low running cost, the designer believes that children learn from bulbs about how light materialises. Since there are no partitions between the spaces, there are no surfaces where switches could be installed. Therefore, lighting is turned on by pooling, which operates the lights only in the immediate area and that surrounding it (DETAIL, 2008, p. 286).

**Figure 72: Naked light bulbs in the Fuji KG**

### c. Partitions

The partitions installed in the Fuji KG reflect Japanese traditions and characteristics because not only are they considered a kind of oriental furniture but they also originate from their building style. These folded doors and panels, which used to be made from 'rice paper' and gampi tree 'bamboo' or hemp, are called 'Shoji screens'. Although they were made with different types of folding, the main aim of using these screens is still to separate one room into different spaces.

Although the Shoji sliding doors in the Fuji KG are made from wood and glass instead of using rice paper, they are inspired by the traditional Japanese doors.

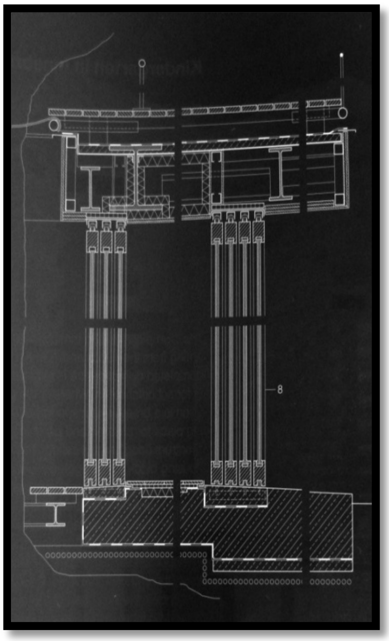
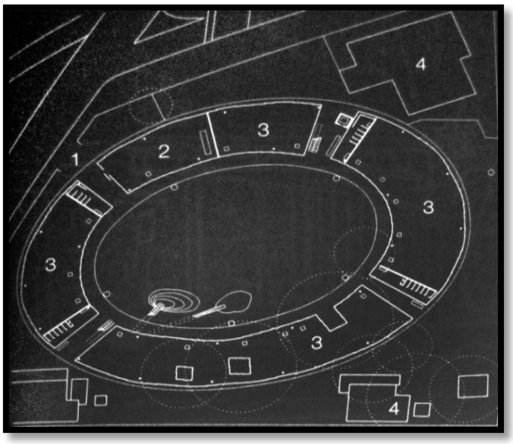


**Figure 73: Slide movement in KG classrooms**

The slides can be folded into each other so that they take up less space when they are fully folded back. Moreover, they do not need multiple columns for underlying such as with regular doors. The doors glide on suspended metal tracks, which are located in the wooden flooring of KG classrooms and look like 'narrow trenches', regulating the movement of these segments and their trends when they are folded (Figure 72 and 73). The main advantage of using these types of folding door ‘panels’ is the ability to change the KG rooms from closed spaces to fully opened spaces in minutes and without obstructions, or reserve space for storage. In addition they increase the usability of any room.

### D) The Fuji KG layout




Floor Plan

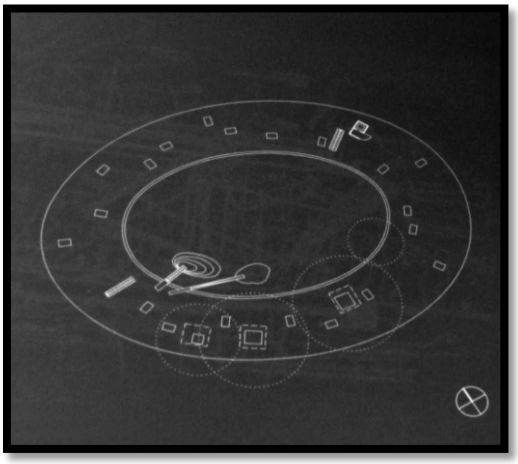
. Entrance

. Childcare staff

. Group room

. Existing school

**Figure 74: Floor plan**



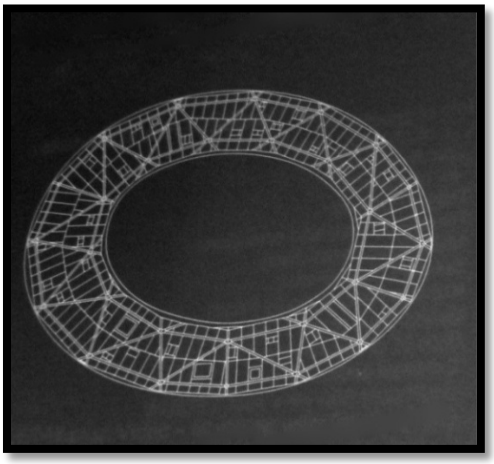


**Figure 75: Roof plan, 1,094$m^2$**

**Figure 76: Steel roof structure**

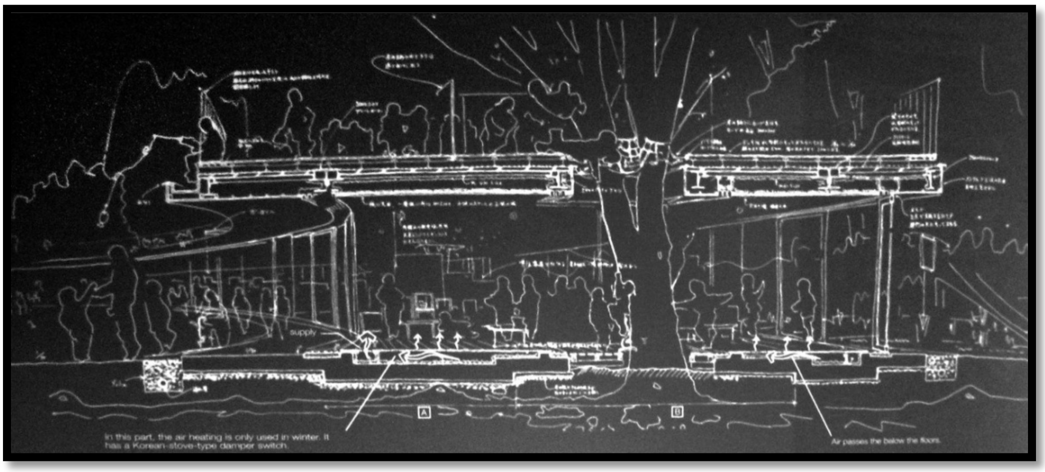



Figure 77: Section

**E) The principles of design that have been followed in the Fuji KG**

1. Respect the environment and help children to be aware of the importance of its elements, such as water, air, trees and earth.
2. Reflect the Japanese heritage.
3. Help children to grow up through their own effort and encourage them to gain their own basic experience.
4. Educate children by encouraging them to contact and deal with others.
5. Focus on the individuality of the children.
6. Architecture should encourage children to observe a certain order by themselves, such as placing their shoes in the proper place.
7. More corners means more disadvantages in KG classrooms.
8. Afford clear sight lines.
9. Keep an eye on the children’s safety.
10. Create ‘fun’ places for children to make the KG become their favourite location.
11. Give the teacher the ability to keep visual contact with the children.
12. Freedom of movement; the designer aimed to merge spaces.
13. Mobile furniture as much as possible.
14. Free access and no limitation as much as possible.

**F) Summary**

Tezuka's KG is friendly to human beings and shows a deep understanding of Japanese daily life. It is clear that creating comfort was a vital issue in designing this facility, which can be seen in the quality of the space. It focuses on many zones in the KG, such as where children can feel the breeze, the sunlight and the changing of the seasons. In addition, it keeps in mind the spaces where pupils can be encouraged to establish new relationships with one another. The building is also in harmony with the landscape. This is very important because the majority of Japanese children are growing up in limited and closed areas, especially in cities as well as in all the industrial areas. The Fuji KG not only affords comfortable and enjoyable places but also a largely virtual environment.

This case study shows that future designs should not only create safe and secure learning environments, but also work on reflecting their tradition and heritage in these educational structures. This case study presents that ultra-modern design and advanced style construction do not mean that designers will copy the Western KG patterns to JP, but they can use Western technology in the building and running of such KGs to show their heritage, culture and their own philosophy in KG education and life. In other words, the Japanese designer has used modern Western technology and some of their regulations to serve the Japanese children's needs and the Japanese educator's concepts in this specific country, which may be considered unacceptable in some of the Western countries themselves.

## 4.2. THE SECOND INTERNATIONAL CASE STUDY: SIGHARTSTEIN KINDERGARTEN (AUSTRIA)

**The importance of Sighartstein KG as a case study to the research**

This case study is significant to this research because it not only emphasises the freedom of movement without any kind of obstacles that encourage all children (wherever they are or live) to communicate as well as using the colours that allow children to rest and relax or to concentrate on their play, but also it focuses on creating a supportive learning environment that is environmentally-friendly. Moreover, this scheme shows that creating a modern design structure with a high-tech building is possible, while keeping an eye on the harmony with the environment factor.

This take attention of PS designers and decision makers that eco-buildings are not limited in using natural raw materials in their contractures to be considered environmentally friendly (such as PS traditional house). In addition, it indicates that new buildings do not have to look very old or uncomfortable to be compatible with the local environment.

In other word, this case study give a good lesson about the ability of achieving balance between a high-tech building structure while preserving harmony with the surrounding environment, the green living and an eco-friendly learning environment.

### 4.2.1. Background about the Sighartstein KG, Land Salzburg

The KG is integrated into the landscape like a chameleon. The Sighartstein KG was designed by Kadawittfeldarchitektur[20], whose proposal for the building won 1st prize in the public architecture competition in 2003. The project was realised between 2008 and 2009 with a budget of €1,200,000 (Table 10) (Müller-Langguth, 2012).

[20] Award: 2009 - Intern. Architecture Awards 2010 The Chicago Athenaeum - Anerkennung - Kindergarten Sighartstein, 2009 - Europäischer FarbDesignPreis 2008-2009 - 2.Platz - Kindergarten Sighartstein, 2009 - AR Emerging Architecture Awards 2009 - Anerkennung - Kindergarten Sighartstein

| | |
|---|---|
| Square footage | Net floor area: 830m²<br>Effective area: 640m²<br>Gross floor area: 1001m²<br>Construction volume 3.665m³ |
| Location | Sighartstein, Land Salzburg, Austria |
| Client | Stadtgemeinde Neumarkt am Wallersee |
| Construction | Reinforced concrete building |
| Construction cost | €1,200,000. |
| Duration | 2008 - 2009 |

**Table 10: The above table summarizes the second international case study from Austria, Sighartstein KG (kadawittfeldarchitektur, 2009)**

**Sighartstein KG building cladding:**

- Thermal insulation composite system
- Low-emission and noise control glass in windows and post-and-beam construction
- Exterior sunscreen in the colour of the thermal insulation composite system
- Curtain wall powder-coated aluminium ornament
- Greened flat roof/extensive vegetation layer
- Sun panels on the roof area

### 4.2.2. The general external view

The first impression of this project is its location. It is built in the core of nature. This cubic building is integrated well with nature and its elements (Figure 78). In addition, it is easy to identify the character and the trend of this KG from the first look.

This project was designed in the form of green decorative elements on the top floor of the two-storey building. The stylised grass blades are not only ornamental, but also act as an extension of the landscape theme; for example, the staccato row of spruces visible at the field's edge or the branches of the close green trees. Therefore, the KG design seems integrated with its surrounding, while the simplicity and harmony are clearly shown. The building seems natural by adapting the green colour in the aluminium reflectors.

This decoration is coated by aluminium powder, which is a reflector of heat. The classrooms have easy access to the garden. The classrooms are designed to be safe from bright sunlight by using the above-mentioned type of aluminium reflector and flat glass (Figure 80).

The removable metal elements are designed to look like blades of grass or branches of trees. Also of note is the use of transparent glass on the front of building, which maintains the relationship (the visual contact) between outside and inside (Figure 83).

In brief, the characteristic of this KG is the simplicity in construction and design with its harmony with the environment, in spite of applying high safety standards and technology methods in the construction process.

**Figure 78: The main entrance of Sighartstein KG (Photo by Angelo Kaunat, Salzburg)**

Figure 79: The KG is sheltered from bright sunlight by the external cladding (Photo by Angelo Kaunat, Salzburg).

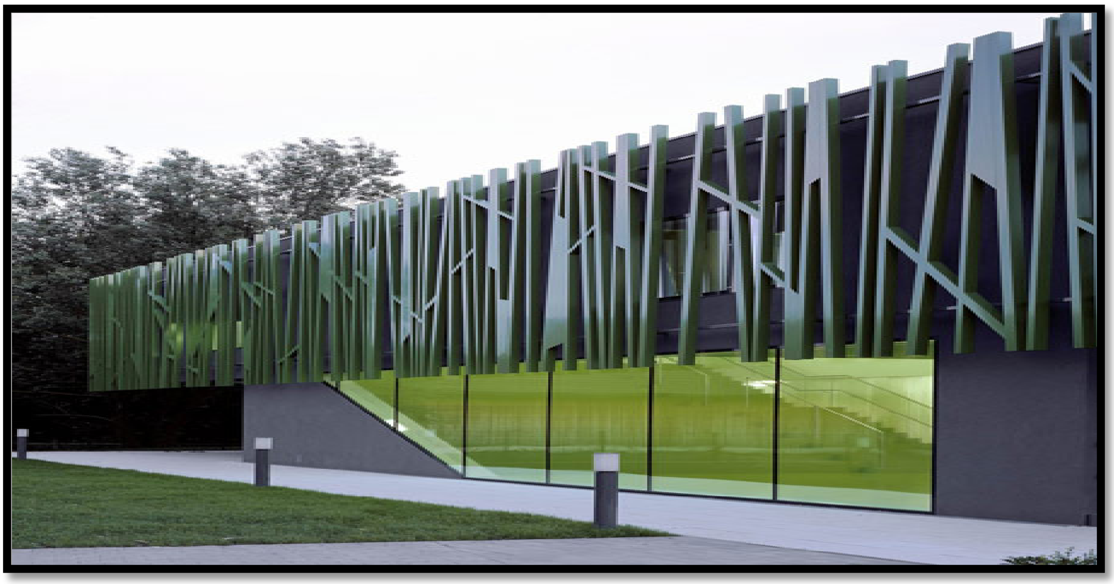


Figure 80: The relationship between out and in (Photo by Angelo Kaunat, Salzburg).

### 4.2.3. The general interior view

The inner organisation follows simple logic of use: KG groups have free access to the courtyard while the nursery groups are kept safe on the floor upstairs. The central point of the building is the multifunctional area, which is located at the junction between the different areas of activity (Figure 82).

The classrooms have been divided into two groups, which are lined up along the south side. Each group has direct access to the courtyard. In addition, each classroom has a storage space, wardrobe and lavatory. Moreover, there are some extra rooms, such as the area for administrators and staff, a quiet room and a public hall for food. The core of the building is a multifunctional hall – a communicative centre for children and caretakers, used as a junction for various functions: a space for shared activities and an alternative space for bad-weather activities. The staircase and hall have a green, natural-rubber floor and are used as multifunctional, shared areas (Figure 81).

Although the main building structure has been made from concrete, the building has been designed to save energy and water, which will not only reduce the running cost but also be environmentally friendly. The best environmentally friendly materials and technology have been installed and applied in this building, such as isolated flooring and walls, double-glazed existing windows for noise reduction and thermal insulation, high-tech climate control solutions and HVAC (Heating, Ventilation & Air Conditioning).

#### A) The colour of the KG

Because the KG facility is considered the first step towards gaining education and independence, the designer chose green for his project. It is the colour of life, youth and spring. Psychologists believe that green can play a vital role in children’s lives by enhancing characteristics such as helpfulness, patience, tolerance and contentedness. The background of the Austrian school is green because the colour is easy on the eyes and serves as a contrast to other colours, thus allowing one to better concentrate on the essentials. The colour green not only expresses the concept of freshness, but also shows youth. Children learn via playing and they need a comfortable and relaxed place to concentrate on what they are doing.

### B) Lighting

The floor-to-ceiling windows, which are installed in the ground floor, are not removable barriers between inside and outside, but they do invite nature straight into the facility by lighting up the classrooms with plenty of sunlight. In addition, the window openings of the upper floor, which are located directly behind the ornamental elements, create a completely different light and provide the youngest users of the nursery group with an atmosphere of nurturing shelter. The lighting systems that are installed on the ceiling reflect the innocence of childhood and the atmosphere of play and fun as a result of their shape and colours, which look like flying balloons (Figure 81).

**Figure 81: The KG hall is covered by a green natural-rubber floor**

**Figure 82: Green lino flooring**

**Figure 83: Open view**

**(The photographer is Angelo Kaunat, Salzburg)**

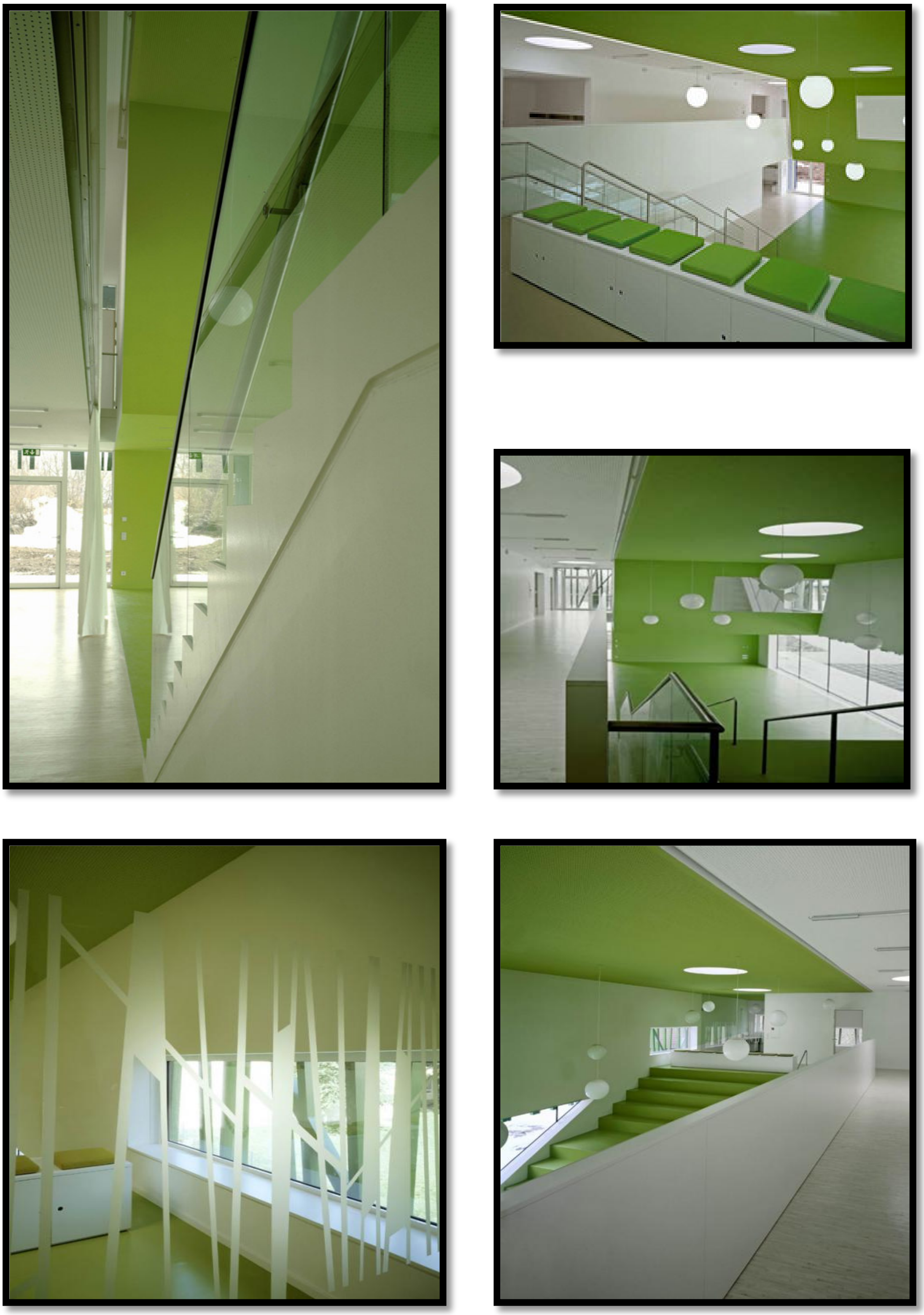


**Figure 84: The above photos show the general interior view (Photographer: Angelo Kaunat, Salzburg)**

### 4.2.4. The Sighartstein KG layout

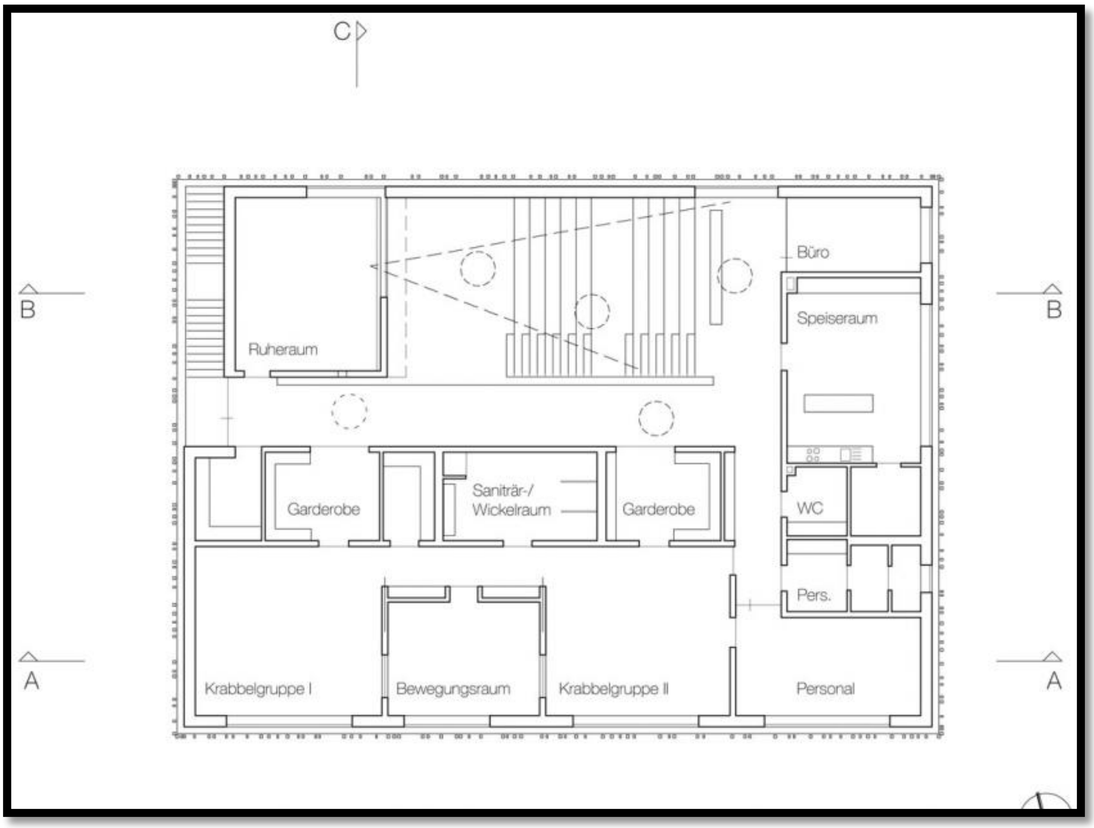



**Figure 85: Horizontal section**

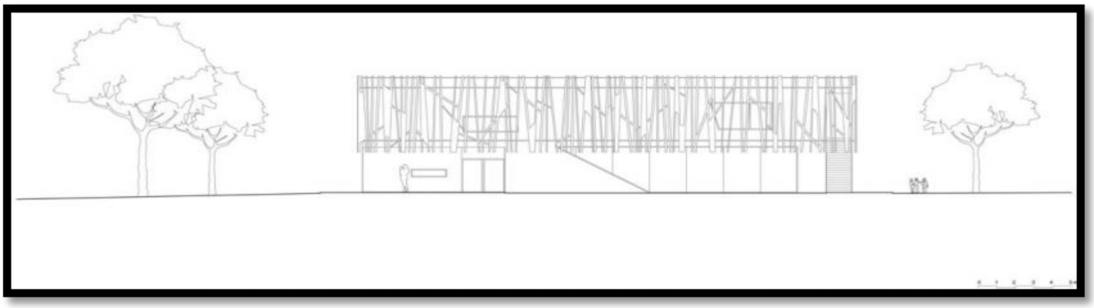


**Figure 86: The front view**

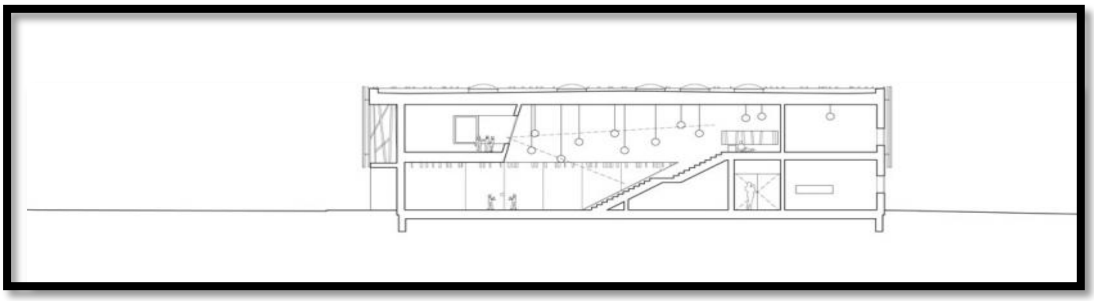


Figure 87: Section (B-B)

### 4.2.5. The main principles that can be concluded from this design

1. The building respects various criteria of sustainability.
2. Even ultra-modern buildings must be integrated and compatible with the surrounding environment so that they are a part of it and not extraneous.
3. Harmony with the environment does not mean buildings have to be devoid of modern technology in construction.
4. Simplicity and lack of complexity in form and content is the basis of this work.
5. There is communication between the inside and outside of buildings.
6. Colours can play a vital role in children's spaces to create the feeling of satisfaction and balance for the children.
7. Freedom of movement, relaxing and concentrating on play are a priority for encouraging and motivating children in this project.

### 4.2.6. Summary

The Sighartstein KG fits into its surrounding environment because it is inspired not only by its lines but also by its colours, while at the same time making its imprint on the place. The graceful colour green can be noticed everywhere in the facility, while the lines of trees and bushes appear obviously on the front of structure, which is the unique characteristic of the design. In Sighartstein, Austria, designers are inspired by open fields and freedom of movement without any kind of obstacles that may hinder their young children. The freedom of movement appears in the multifunctional rooms and in the spaces around the building itself. The hall of the KG allows children to rest and relax or to concentrate on their play.

The aim is to make them feel at ease and to encourage them to act and move at the same time. The colour green supports this trend by providing a feeling of satisfaction and balance in the children. When planning the Sighartstein KG, great attention was paid to providing the children with an environment in which they could grow up in balance and in accordance with their natural requirements.

Designers are able to create what can be called an ultra-modern design with high-tech equipment that achieves their customer's (children and KGs) needs, while keeping an eye on two factors: harmony with the environment, and eco-building. Therefore, the buildings in PS need not be made from mud and earth to be environmentally friendly, and neither do they need to look old and classic in order to be considered well-integrated with the local environment. This project proves that any building can be ultra-modern and apply high-tech methods to run such buildings, while it can still be friendly and compatible with its environment, even if it is built using concrete.

## 4.3. THE THIRD INTERNATIONAL CASE STUDY: LIMPOPO PROJECT (SOUTH AFRICA)

### The importance of Limpopo KG as a case study to the research

Both KG facilities in the international case studies (from Japan and Austria) were able to either achieve a balance between the requirement of ultra-modern design by preserving the culture and heritage of the local people, or achieve a balance between a high-tech building structure while preserving harmony with the surrounding environment, the green living and an eco-friendly learning environment. However, both of them are considered too expensive examples for the PS territories. This can give a bad first impression that only most developed countries and rich governments are able to establish such high-cost KG building structures, which are green living, eco-buildings, safe and healthy learning environments, and also are able to reflect the culture and heritage of the local people while serving educational aims.

This case study from South Africa, where the Limpopo project is located, will show that even low cost KG facilities with simple and basic structure materials are able to achieve most of the aims that both KGs from the previous international case studies (Japan and Austria) could reach. The Limpopo case study will be important to this research because South Africa and the PS territories share similar difficulties, which are concentrated mainly in the low per capita income and limited financial resources to a broad category of individuals and private educational institutions.

### 4.3.1. Background of Project Limpopo

This scheme aims to build an affordable education facility in an impoverished region of South Africa by using simple and inexpensive materials. Architecture students and staff from the University of Nottingham aimed to design a KG that is environmentally friendly. They will encourage the use of local suppliers and manufacturers to achieve these aims, which will help to transfer knowledge and skills to the local people (Boocock, 2011).

A team of architecture students have designed and built a new early education facility for young children living in the Limpopo province of South Africa. The students came up with a simple, environmentally friendly and functional design which allows and encourages the use of local suppliers and manufacturers and the KG facility will provide places for 150 children from the Calais Township (Table 11). It will be the second educational building for young children that students in the Department of Architecture and Built Environment have designed and built in Africa. They are working in partnership with Education Africa, a charity working to improve access to education across South Africa.

| | |
|---|---|
| Location | Calais Village in the province of Limpopo 450km north of Johannesburg and about 50km south of Tzaneen, South Africa. |
| The budget of project | £150,000 = approximately $176,000 |
| The age of children | The overall 150 children |
| The teamwork | A team of 50 undergraduate students (second and fifth year) and staff from the Department of Architecture of the University of Nottingham, the UK. |

**Table 11: The above table summarizes the third international case study from South Africa, Limpopo Project, Calais Village, (Letaba Herald, 2011), (UoN, 2011) and (Boocock, 2011)**

In 2009 a group of 2nd and 5th year students built a pre-school for 150 children aged from two to six years old in the township of Jouberton 160 km south of Johannesburg. A team visited the school last summer to see for themselves how it had helped transform the lives of local school children. That project had a remarkable impact on the students and inspired many more to apply to join Project Limpopo. As part of this year's project, students will be going back to Jouberton to undertake any repairs and improvements.

The 2nd and 5th year students have come up with a simple, environmentally friendly and functional design which allows and encourages the use of local suppliers and manufacturers – from the corrugated steel roof to the timber walls and cladding. The simple modular design will also reduce wastage and improve ease of construction for an unskilled workforce. Before embarking on the project however, the students had the mammoth task of raising £150,000 to enable them to buy raw materials and tools as well as flights and accommodation. With help from generous alumni gifts and from the University's Development Office, the total was reached.

a) The province of Limpopo in South Africa.

b) The rural village of Calais in the Limpopo province

c) The site has been stripped of surface vegetation, with the significant trees retained.

d) The plot of KG project.

**Figure 88: The above photos (a-d) show the location of Project Limpopo, Calais village in South Africa,. Photos by Google Earth (UoN, 2011)**

### 4.3.2. The general external view

Although the project is located on the outskirts of the village, which has a unique location overlooking landscape and mountains (Figure 88), this open sunny area is still easily reached by villagers, especially after carving a new road in Calais village to give much better vehicle access to the site (Edmonds & McMath, Letter from Limpopo, 2011).

The construction site has a flat ground level. This granted the architects a great opportunity and facilitated the design process by giving them a wider choice and greater freedom of design. In addition, this reduced the cost of the future groundworks, such as preparing and excavating the base.

The site has been stripped of surface vegetation but the large major trees have been retained (Figure 89-90).

**Figure 89: Photo by Nicholas Gaston (UoN, 2011).**

**Figure 90: The location of the first classroom (UoN, 2011)**

**Figure 91: The second class. Photo by William Holley (Holley, 2011)**

**Building materials**

Concrete: this has been used to produce a flat base to build on, with timber roof trusses, and blocks for walls (Figure 92). In addition, concrete blocks have been used for building the exterior walls (Figure 93).


**Figure 92: Block walls. Photo by William Holley (Holley, 2011)**

**Figure 93: The concrete flat base (Holley, 2011)**

Timber: the trusses are simple trussed beams with bolted connections (Figure 94, 97 and 107). The columns have been termite-treated. All the exposed timber which was untreated needed to be primed in order for the coloured paint to take to the wood. Timber batons are used for cladding the south façade to contrast with the metal cladding elsewhere and add interest to the elevations. Ply boards were installed on a lightweight wall on the inside edge (Figure 103).

Painting: the timber trusses have been painted to protect them and add beauty and interest to make the KG more appealing. The timber window frames are in bright colours (orange and blue) for the same reasons (Figure 91).

Insulation materials have been installed on light walls and an internal plywood cladding (Figure 96).

Figure 94: timber roof trusses. Photo by (Edmonds, Letter from Limpopo, 2011).

Figure 95: Photo shows painting windows process, and temper cladding for the outer walls (Edmonds, Letter from Limpopo, 2011).

Figure 96: Fitting insulation and a deep proof membrane into the timber stud wall and an internal ply wood cladding (UoN, 2011).

Metal cladding: the roof has been covered by corrugated galvanised steel sheets (Figure 97–99), which are considered a common cheap roofing material in Limpopo Province (Holley, 2011).

Figure 97: The roof truss. Photo by William Holley (Holley, 2011).

Figure 98: Install the corrugated steel roofing for the classrooms (UoN, 2011).

Figure 99: Metal cladding Photo by William Holley (Holley, 2011).

### 4.3.3. The general interior view

Figure 100: Smooth finish for the interfaces (Holley, 2011).

Figure 101: The interior partitions and their wooden structure (UoN, 2011)

Figure 102: The toilet block consists of 4 separate sections: Adult toilets, girls and boys toilets and a store room with a sink (Holley, 2011).

Figure 103: Ply boards to cover the interface walls (UoN, 2011).

### 4.3.4. The KG layout


**Figure 104: The above photos show the final form of the Project Limpopo after the completion of construction, photos by University of Nottingham, Project Limpopo (Noone, 2011).**

**Figure 105: The backyard of Limpopo KG, photos by University of Nottingham, Project Limpopo (Noone, 2011).**

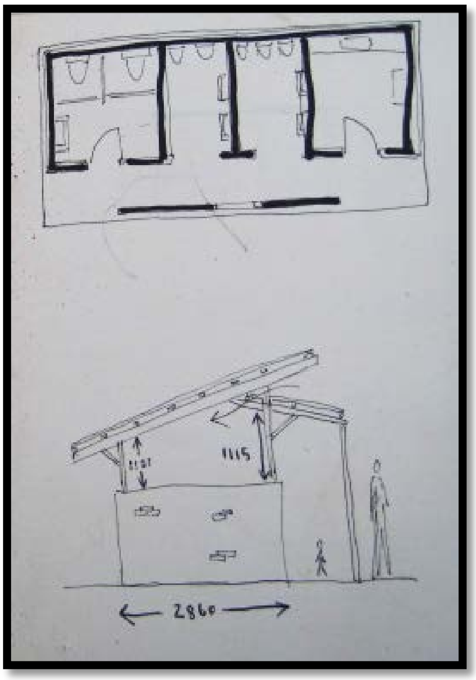



**Figure 106: Plan and side elevation of the toilet block (Holley, 2011).**

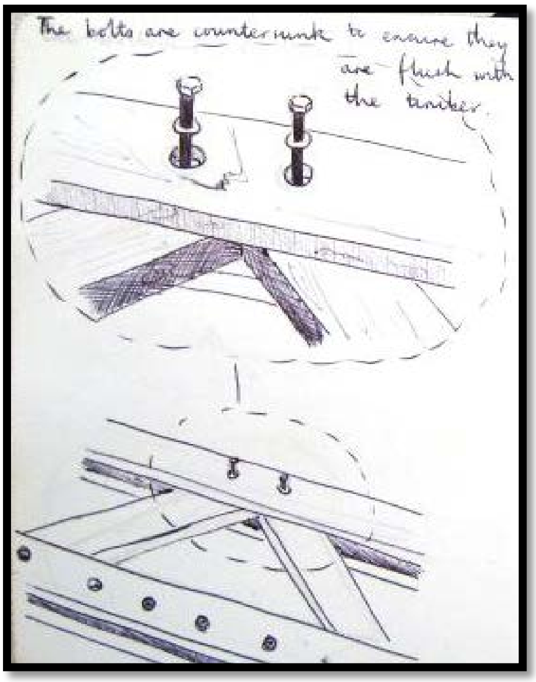



**Figure 107: The method of compiling and linking the timber roof trusses (Holley, 2011).**

### 4.3.5. The main principles that can be concluded from this case study

1. Quality does not always have to be associated with high cost
2. Economic does not mean sacrificing quality

### 4.3.6. Summary

In this project it has been seen how the good management of limited fund of Limpopo project[21] can be used to subdue the available resources (materials) of the local environment, which can be considered the best economic solution for their problems, to achieve the minimum requirement of quality. In addition, it plays a vital role in creating functional, practical, enjoyable and interesting environment for children. However, this aim would not be achieved without the great awareness of the importance of interior design and the role that interior environment plays in KG facilities. This awareness and knowledge of the working teams in this project could collaborate in this successful, which comes via afford an economic solution for the community needs without sacrificing with the quality of the KG environment, This prove that quality does not always have to be associated with high cost and also the high cost of project does not necessary mean quality.

[21] Compared with the first two international KG projects from Japan (€1,540,000) and Austria (€1,200,000)

## 4.4. CASE STUDY FROM THE UK

The objective of this case study is to identify those responsible in monitoring the learning environments of pre-school facilities and the licensing of their buildings in the UK and also the role of each of them. In addition, this part of the study aims to identify the British approach in the verification and inspection of KG buildings and to highlight the British method used in the classification of KG buildings based on the outcomes of inspections. The British methodology in addressing problems which are related to the quality of the learning environment in KG facilities will be clarified as well.

### 4.4.1. Background

#### 4.4.1.1. Education system in the United Kingdom

The term 'kindergarten' is rarely used in Britain to describe pre-school education. Pre-schools are usually known as nursery schools or playgroups. However, the word 'kindergarten' is used for more specialist organisations such as forest KGs, and is sometimes used in the naming of private nurseries that provide full-day child care for working parents.

Education in England may differ from the system used elsewhere in the United Kingdom (UK). In general, there are two systems: one covers England, Wales and Northern Ireland and the other covers Scotland (Table 12). Both systems have different emphases. Traditionally the English, Welsh and Northern Irish system has emphasised the depth of education, whereas the Scottish system has emphasised the breadth. In addition, education in Northern Ireland differs slightly from the system used elsewhere in the UK. The Northern Irish system emphasises a greater depth of education compared to the English and Welsh systems. Moreover, school holidays in Northern Ireland are also considerably different to the rest of the UK. In general, the cut-off point for ages is the end of August, so all children must be of a particular age on 1st September in order to begin class that month. In addition, what is called in England and Wales 'the reception stage' means the year before the first grade.

<table>
<tr><th colspan="14">The United Kingdom</th></tr>
<tr><td>Jurisdiction</td><td colspan="3">Northern Ireland</td><td colspan="5">Scotland</td><td colspan="5">England and Wales</td></tr>
<tr><td>Education stage</td><td colspan="3">Primary School</td><td colspan="2" rowspan="2">Nursery School</td><td colspan="3">Primary School</td><td colspan="5">Child care, Baby care or Day care</td></tr>
<tr><td>Key stage</td><td colspan="3">Primary</td><td colspan="3">Primary</td><td rowspan="2">Child-minders</td><td colspan="2">Foundation stage</td><td colspan="2">Key Stage 1</td></tr>
<tr><td>Year level</td><td>1</td><td>2</td><td>3</td><td colspan="2">Year1</td><td>1</td><td>2</td><td>3</td><td>Nursery -School</td><td>Recep-tion</td><td>Year 1</td><td>Year 2</td></tr>
<tr><td>Ages</td><td>4-5</td><td>5-6</td><td>6-7</td><td colspan="2">Age range 3-5</td><td>Age range 4-6</td><td>Age range 5-7</td><td>Age range 6-8</td><td>0>3</td><td>3>4</td><td>4>5</td><td>5>6</td><td>6>7</td></tr>
<tr><td>Tuition Fees</td><td colspan="3">Funded</td><td>Non-funded</td><td>Funded for >4</td><td colspan="3">Funded</td><td>Non-funded</td><td colspan="3">Funded up to 2.5 hours per day and for 5 days a week, with an extra £55 for working parents, which covers 1-2 extra days</td><td>Funded</td></tr>
<tr><td>Compulsory</td><td colspan="3">√</td><td colspan="2">X</td><td colspan="3">√</td><td>X</td><td colspan="4">√</td></tr>
</table>

**Table 12: The school years in the UK**[22]

All three- and four-year citizen children are eligible to receive about 15 hours of free nursery education for 38 weeks of the year. This applies until they reach compulsory school age (the term following their 5th birthday). Free nursery education can take place in nurseries, playgroups, pre-schools and in some cases at childminders too.

Children 4-6 years old usually attend KG to learn social skills from their teachers, play, draw, play music, sometimes the basics of reading and writing, and various other activities. For children who previously have spent most of their time at home, KG often serves the purpose of training them to be part of their society. Besides that, this could give their parents enough time for rest without worrying about them. KGs often follow a half-day care system (morning or afternoon), but in many locations there are full-day KGs.

[22] In general, the cut-off point for ages is the end of August, so all children must be of a particular age on 1st September in order to begin class that month.

Year 1 and Year 2 of primary school are known as Key Stage 1, whereas Years 3 to 6 of primary school are known as Key Stage 2. Compulsory National Curriculum subjects are the same for Key Stages 1 and 2, which are as follows:

- English
- Maths
- Science
- Design and technology
- Art and design
- Music
- Physical education
- Geography
- History
- Information and Communication Technology (ICT)

Schools also have to teach religious education, though parents have the right to withdraw children for all or part of the religious education curriculum. In addition, schools are advised to teach personal, social and health education and citizenship, together with at least one modern foreign language.

The Directgov Website, which is the UK government's digital service for people in England and Wales, shows the Homework Guidelines for primary schools at Key Stage 1 (Year 1 for ages 5-6). This guideline points to the importance of homework and how it can help children to learn, rather than whether it takes a certain amount of time. It suggests that children aged 5 to 6 in Years 1 and 2 need about one hour per week to do this homework, although some children will work quicker than others and get more done in less time (Directgov, 2011).

At the end of Key Stage 1, KG teachers will evaluate and assess pupils' progress and their performance in English and maths, measured by special tasks and tests that are administered informally. The results of these tests can give a good idea about children's performance in selected subjects on a particular day. In addition, schools can use the test results as an independent measure of how they, and their pupils, are doing compared to standards across the country.

Free transportation is available from home to school for a wide range of children, especially those who are considered in need. Therefore, depending on where the child lives, his/her parents' income and the child's age, this child could be qualified to get this free service.

In addition, if some pupils have special educational needs or a disability they might also be eligible (Directgov, 2011).

In England and Wales children could qualify for free lunches or milk, or be given free fruit and vegetables at school. Local authorities must provide free lunches for eligible pupils, paid-for meals where requested and good facilities and supervision so pupils can eat safely. All food provided by local authorities must meet national nutritional standards. These ensure that children are provided with a healthy, balanced diet. The new standards were introduced in September 2006 and September 2007, and include for example:

- high-quality meat, poultry or oily fish regularly available
- at least two portions of fruit and vegetables with every portion
- bread, cereals and potatoes are regularly available
- fizzy drinks, crisps, chocolate and other confectioneries must be removed from school meals and vending machines.

The government's responsibility is to provide primary schools with both free meals and meal facilities that can meet the nutritional standards.

#### 4.4.1.2. Pre-school hours and costs in the UK

Most KGs in the UK operate morning or afternoon sessions (typically 9am-12.30pm or 12.30pm-3pm) but many also offer full-day sessions (9am-3pm). Furthermore, some facilities may offer extended care (all day) at an additional cost, which can be a great advantage for working parents.

KGs’ fees vary dramatically across the UK and depend on the type of group, child's age, and the number of hours of attendance. In 2013, the average cost of one week’s holiday childcare in Britain is £109.23 (Rutter, 2013) (see Table 13). However, working parents on low incomes can receive up to 70% of their childcare costs up to a maximum of £175 per week for one child in childcare and £300 per week for two or more children.[23] Yet, in many areas there are KG facilities whose costs exceed £175 per week per child, such as in inner London where it costs between £226 and £400 a week[24] (Gentleman, 2009). In addition, children attending for a full or extended day will be given lunch/dinner and snacks so parents will need to pay a fee for that.

| Region/nation | Maintained (school, local authority) sector holiday club or play scheme | Private, voluntary and independent sector holiday club or play scheme |
|---|---|---|
| East of England | £130.61 | £128.95 |
| East Midlands | £85.33 | £119.63 |
| Greater London | £84.83 | £112.11 |
| North East | £76.92 | £124.15 |
| North West | £95.97 | £108.28 |
| South East | £109.50 | £125.18 |
| South West | £106.00 | £111.94 |
| West Midlands | £96.86 | £109.49 |
| Yorkshire and Humberside | £96.58 | £120.68 |
| England (Regional Average) | £98.07 | £117.82 |
| Wales | £87.62 | £108.52 |
| Scotland | £120.23 | £101.35 |
| Britain average | £101.97 | £109.23 |

**Table 13: The weekly cost of holiday childcare across Britain, 2013 (Rutter, 2013)**

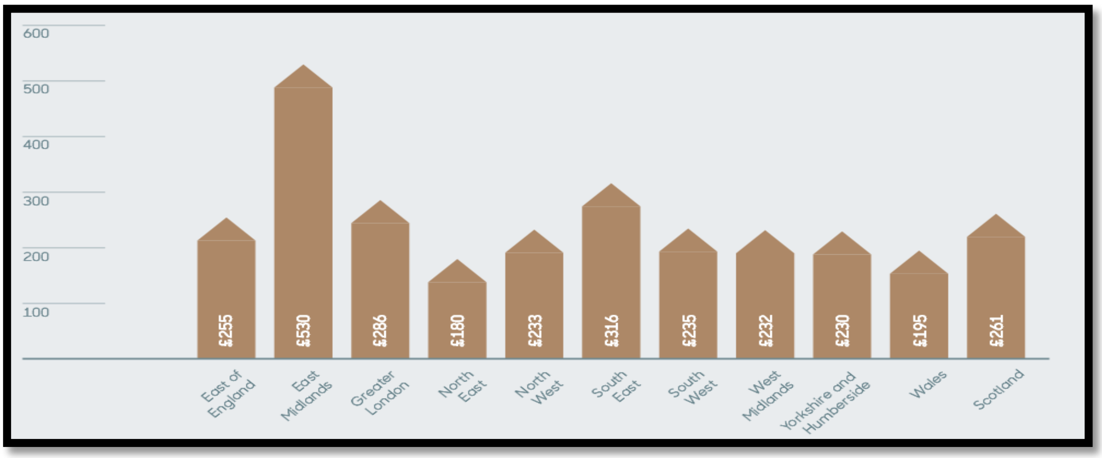



**Figure 108: Most expensive holiday childcare for full-time place per week, by region, 2013 (Rutter, 2013)**

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[23] It used to be up to £122.50 a week - for 1 child and up to £210 a week - for 2 or more children.
[24] Up to £20,800 a year (in 2009)

In 2013, the Family and Childcare Trust published the annual childcare costs surveys[25] showing that parents living in the East of England are not only paying more than anywhere else in Britain at an average of £128.95 per week (see Table 12), but also they have the most expensive holiday childcare that costs £530 per week. Figure 108 gives the most expensive holiday childcare in each region and nation of Britain.

On the other hand, many parents use a family member for childcare. They may ask a grandparent or another relative to look after their children. Informal arrangements with relatives make up the majority of childcare arrangements. It is low-cost and flexible, and it means their child will be looked after by someone they know very well. Relative care works best if you have a good relationship with a relative, and if they are willing and able to help. If parents can arrange for a relative to care for their child, it may give him or her more love and security than other childcare options.

#### 4.4.1.3. Assessing child development in British KGs

In 2008 the Early Years Foundation Stage (EYFS) was established to provide a framework that can provide a high quality learning environment for all children at the pre-school stage. It has the responsibility to set standards for the learning, development and care of children from birth to 5 years old, while all KG providers must follow the EYFS.

There are two assessments, the first one when a child is aged between 2 and 3 years and the second time is at the end of the academic year when they turn 5 years old. It should be pointed out that these are not tests for the child - the assessments are based on EYFS practitioners’ observations. Information from these tests is used for parents, practitioners and teachers to support children’s learning and development.

[25] Sponsored by Computershare Voucher Services

At this stage, EYFS concentrates mainly on seven fields, which are:

1. communication and language skills
2. physical development
3. personal, social and emotional development
4. literacy
5. mathematics
6. understanding of the world
7. expressive arts and design.

The main rule is based on teaching children through playing. This goal is achieved within the KG environment when a child learns about subjects and other people through games. At the end of the academic year when a child turns 5 years old, the practitioner records each child's development by watching the child playing and in the classroom. The completed assessment is known as the 'Early Years Foundation Stage profile'. This is used to help the Year 1 teacher plan lessons for the children.

### 4.4.2. KG inspection in the UK (England)

The Office for Standards in Education, Children's Services and Skills (Ofsted) has the responsibility to inspect and regulate services that care for children and young people, and those providing education and skills for learners of all ages in England. Ofsted reports directly to Parliament and it is considered independent and impartial. It carries out hundreds of inspections and regulatory visits, and publishes the results on its website.[26] Ofsted works with providers which have not reached a sufficient standard, in order to promote their improvement and monitor their progress.

In another words, Ofsted acts as a regulator, checking that people, premises and the services provided are suitable to care for children and potentially vulnerable young people. Where

[26] To view inspection reports, go to: (http://www.ofsted.gov.uk/inspection-reports/find-inspection-report)

childcare or children's social care providers do not meet the required standards, it requires them to take the necessary action to improve or it will not license them to operate. It has the right to access any early education facilities and it has the ability to make expert judgements on the effectiveness of services, to provide unique evidence to local and national policymakers.

#### 4.4.2.1. Inspections schedule

Inspections of registered early years' provision are scheduled as follows.

A) Newly-registered KG facilities: The first inspection will be carried out within seven months of registration, unless they have never had children on the roll. In such case, Ofsted calls the KG provider every six months to find out whether there have been children on the roll at any time in the previous six months or not, because if they still have no children Ofsted can cancel the registration of any KG that has not cared for children for three consecutive years.

B) Previously registered KG facilities: At least once in every inspection cycle (academic year). It should be pointed out that they are more frequent where Ofsted identifies a need to do so, for example where provision was previously judged as inadequate. It could be brought forward in the inspection cycle where Ofsted has received information that suggests the provision may not be meeting the legal requirements of the EYFS; or where assessment of the provision identifies a need for early inspection. In addition, they could be prioritised for inspection where Ofsted has received information that the provision is not meeting the requirements of the EYFS and which suggests children may not be safe.

#### 4.4.2.2. Reasons for considering an inspection

A) Concerns that a KG or childcare provider is not meeting the requirements for registration. In this case, an inspection is brought forward to within the next 5 or 30 days.

B) New manager.

C) At least 50% of staff leaving within a 12-month period.

D) KG moving house.

E) Random sample: Ofsted inspects 10% of the KG facilities on the register at 1 April each year. Those providers will be chosen randomly.

### 4.4.2.3. Inspection activities

A) The inspector observed children's activities in all indoor playrooms and the outdoor play area.

B) The inspector held discussions with the registered person/nursery manager and practitioners.

C) The inspector looked at children's assessment records and planning documentation.

D) The inspector checked evidence of suitability and qualifications of practitioners working with the children, the provider's action plans and a selection of policies.

E) The inspector took account of the views of parents and carers spoken to on the day.

### 4.4.2.4. Concerns about providers

From 1 September 2012, one of three things will take place.

A) An inspection: When Ofsted receives information about a provider – including when someone has a concern – its standard response will be to carry out a full inspection; it will write a report and publish it.

B) Refer the information to the provider: In some cases – after carrying out a risk assessment procedure – Ofsted decides that information they have received is of a minor nature and the provider is best placed to deal with it. In this case Ofsted will write to the provider to tell them this and check when it next inspects that they took appropriate action.

C) Action to cancel the registration of the provider: Very occasionally – where the matter is more serious – Ofsted will not carry out an inspection when it receives information but will take action to cancel the registration.

### 4.4.2.5. Inspection report

| | | |
|---|---|---|
| Grade 1 | Outstanding | Outstanding provision is highly effective in meeting the needs of all children exceptionally well. This ensures that children are very well prepared for the next stage of their learning. |
| Grade 2 | Good | Good provision is effective in delivering provision that meets the needs of all children well. This ensures children are ready for the next stage of their learning. |
| Grade 3 | Satisfactory | Satisfactory provision is performing less well than expectations in one or more of the key areas. It requires improvement in order to be good. |
| Grade 4 | Inadequate | Provision that is inadequate requires significant improvement and/or enforcement. The provision is failing to give children an acceptable standard of early years' education and/or is not meeting the safeguarding and welfare requirements of the EYFS. It will be inspected again within 12 months of the date of this inspection. |
| Met | | The provision has no children on the roll. The inspection judgement is that the provider continues to meet the requirements for registration. |
| Not Met | | The provision has no children on the roll. The inspection judgement is that the provider does not meet the requirements for registration. |

**Table 14: This inspection was carried out by Ofsted under Sections 49 and 50 of the Childcare Act 2006 on the quality and standards of provision that is registered on the Early Years Register.**

#### 4.4.2.6. Raising expectations

Ofsted says that evidence from inspections shows that KG facilities in the UK are not improving fast enough between inspections, mainly in poorer areas.

Sir Michael Wilshaw, who is the regulator's chief inspector, alludes to this problem in his interview with the BBC when he said that "the current number of poor KGs is unacceptable". The latest Ofsted statistics show that in 2012 the majority of England's pre-school facilities were judged as "good" (62%) or "outstanding" (12%) by inspectors, whereas 25% were judged "satisfactory" and 1% classed as "inadequate" (Figure 9). However, it should be pointed out that under the proposed changes from September, only "good" or better will be deemed acceptable by Ofsted (Wilshaw, 2013).

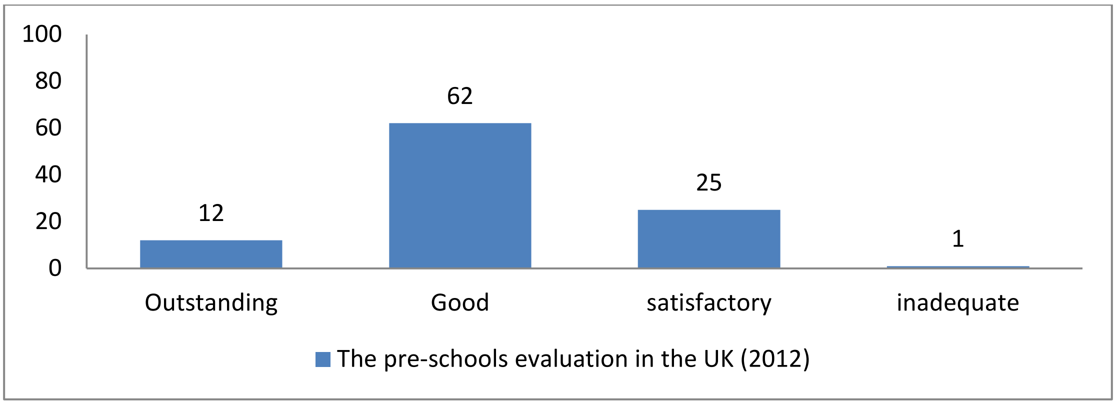


**Figure 109: The pre-schools' evaluation in the UK (2012), by Ofsted**

Ofsted points out that, despite an overall improvement, many children, especially in areas of need, are not well prepared for primary school. Their analysing for the previous inspection reports from the 2011/2012 academic year shows that approximately 34% of children are not working securely in communication, language and literacy by the end of the early years' foundation stage. The outcomes from poor areas were worse when they reached 41% for the same period. Sir Michael Wilshaw says:

> "We all know from the research that children's early years are a period of rapid development and vital for building a secure foundation for future personal and academic success. Parents, whatever their circumstances, want their children to access good-quality childcare and get a good early education that ets

> them up well for statutory schooling. Yet too many providers are not good enough, particularly in the most deprived areas. We must be tougher on weak settings."
>
> (Wilshaw, 2013)

Within the new system, which will work on raising expectations, weak KG facilities not only have to get more frequent inspections but also will have a maximum of four years to achieve a satisfactory level (good rating). Otherwise, those who could not reach these standards may face closure or suspension.

On the other hand, Prof Andy Goodwyn, Head of the University of Reading's Institute of Education, warned:

> "What the sector needs is not tougher inspection but better investment and a period of stability to allow its staff to build up their skills. It needs to become an attractive and high-status sector that can attract graduates who can see a real career path and a sustainable future. The very last thing it needs is more threats, disguised as yet another crusade to 'raise standards'."
>
> (Burns, 2013)

Moreover, although many groups, who represent KG providers, broadly welcomed the focus on improvement, they still have some reservations. For instance, Neil Leitch, who is the chief of the Pre-school Learning Alliance, said:

> "While we welcome the aspiration of high-quality childcare, without a rethink on policy and adequate funding from government, we struggle to see how a real improvement will be made."
>
> (Burns, 2013)

Therefore, Purnima Tanuku, Chief Executive of the National Day Nurseries Association, indicates this point when she urged the government to make sure that there are sufficient support mechanisms in place to help weaker settings get better, because parents or the Government itself may have to pay more if KGs have to get a better learning environment or staff are better educated at a time when costs are already high (see Table 13 and Figure 108) (Burns, 2013).

### 4.4.3. Summary

Ofsted has the responsibility to monitor and inspect all KG learning environments in England and submits its reports directly to decision makers. It is focusing on working with KGs which could not achieve Ofsted's requirements, to promote their improvement and monitor their progress to reach success. Ofsted has two kinds of scheduled inspections based on whether the KG facility is newly-registered or previously registered as an educational facility. In the first case the first inspection will usually be carried out within seven months of registration, then in each academic year; whereas it will take place only in each academic year in the second case. However, more frequent inspections may be carried out where Ofsted identifies a need to do so (refer to page 211) or responding to EYFS recommendations. It is believed that it would be better to have frequent short unplanned visits rather than long organised ones. By the end of each inspection, Ofsted submits its report that determines the strengths and weaknesses of each facility. This will be the first plan, in which Ofsted and the provider will work together to address them directly to achieve the quality requirements. The requirements of considering any pre-school in England 'good' (Table 14) have been raised since September 2012, which received a warm welcome by those concerned in this field, with reservations on some points. For instance, there is concern about its impact on raising the operating costs of KG facilities in England, which will automatically affect the already high tuition fees (see Table 13 and Figure 108).

## 4.5. THE SUMMARY OF THE INTERNATIONAL CASES

Although the previous case studies come from three different backgrounds (countries) that have unique cultures, environments and education systems, all of them share a lot of points in terms of the main principles of designing and licensing KG buildings such as public health and safety. At the same time, each one of them has followed a unique concept, which has the advantage of placing the kindergarten in a superior or advantageous position. While JP KGs find compatibility between practicality, modernity and JP culture (their way of life and construction),

Austrian KGs work on creating harmony between modernity (using high tech materials and patterns) and maintaining harmony with the surrounding environment. In addition, the South African KG was able to create a balance between their children's needs (physically and psychologically) and their limited financial capacity by using locally available materials for construction.

It is believed that each one of these case studies has special expertise and experience that can be used later in this research to enhance the PS experience in the construction and licensing of KGs. MOHE can learn from them the best way to fill any gaps found while they are working on developing their own future regulations that fit PS needs, ability and aspirations (Figure 110).

Regarding monitoring aspect in KG facilities, MOHE can take advantage of the British centres' advanced experiences in this area such as Ofsted, especially in terms of the methodology of carry out the inspections, the preparation of reports and the ways to take advantage of them by all parties concerned to achieve success. Their ways to build the relationship between all parts, which based on trust, the awareness of the importance of the issue, and the common interest and goals are the foundation of deal.

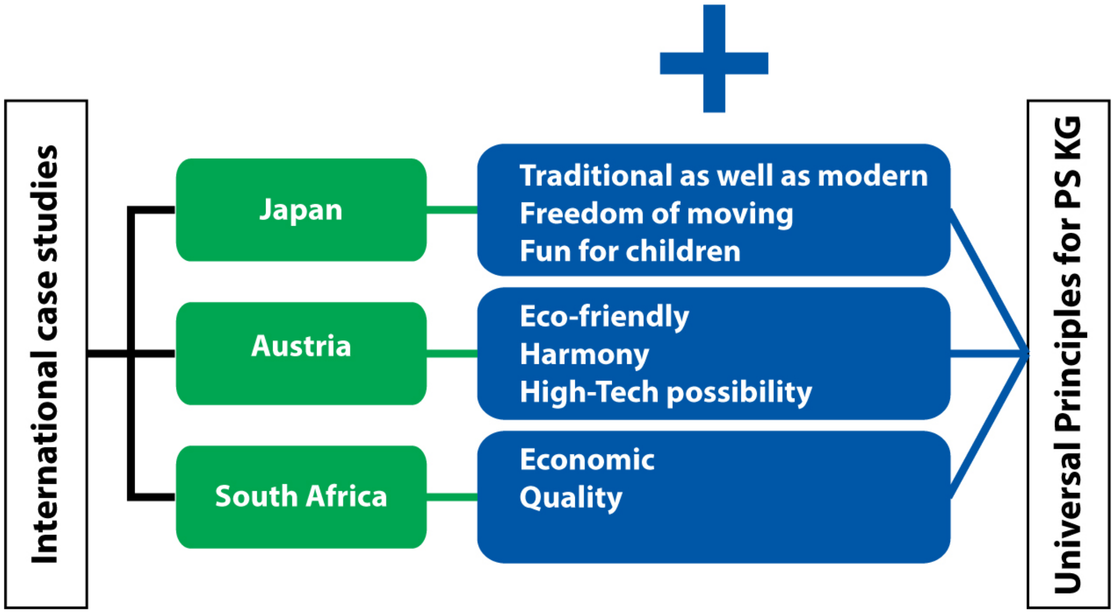


Figure 110: the general principles that could be concluded from the previous international case studi

# Chapter 5 : MEETING WITH MOHE

## 5.1. FRAMEWORK

This phase aims to answer some of the research questions about the viability of any formed written law that can establish the relationship between two of the key players in this study, the kindergartens' (KG) landlords and the Palestinian Ministry of Education and Higher Education (MOHE), in terms of licensing KG facilities in Palestine (PS). This aim would be achieved by using the resource of information that can be certified. Thus, in this case the MOHE office was the best reliable source of data in this field. Meetings have been held at the head office of MOHE in Nablus Province for this goal.

Next, field research was done in PS. This part of the research aims to build a background about the KG environment in PS, which will be significant to identify the main characteristics and features of PS architecture that have been used in the existing KG structures. PS characteristics and features in building can shape the basic architectural principles in the traditional buildings, which have been transferred later to KG structures, as a result of converting them to KG facilities. Therefore, this part of the study will show the impact of these local principles on indoor environmental quality. Furthermore, the basic architectural concepts will be clarified to discover what is still missing, in order for them to be covered later in future MOHE requirements. Thus, new universal concepts could be followed in order to fill this gap, which would enable all parts to achieve the greatest benefit from KGs in PS. The possible future concepts will depend on universal experiments in Japan, Austria and South Africa, which have been done by some of the most developed countries in this field. In addition, this field study aims to discover whether the current MOHE requirements in licensing KG facilities have been applied in the selected sample of KG facilities, which will answer one of the main research questions.

The main objective of the granting of these permits by the ministry is to ensure that the targeted KGs are able to provide the basic requirements necessary in order to achieve a safe and healthy learning environment. MOHE aims by these regulations to ensure that all early educational facilities are capable of achieving the primary educational objectives of KGs for which they have been established (MOHE, 2012). Therefore, a survey focusing on the quality of space at PS KGs will be vital to this study, because it is believed that increasing the quality of space would lead to an increase in the possibility of having a safe healthy learning environment.

This study will first outline the international minimum standards of the main key factors that play a vital role in the quality of space, which are: temperature, humidity, lighting, and the amount of carbon dioxide (ventilation). It is believed that, by meeting the minimum standards that are generally accepted, the quality of space would be improved significantly and it would also ensure that the educational facilities can achieve a healthy and safe learning environment. This safe healthy learning environment is the main reason for establishing PS regulations for licensing KG facilities by MOHE (MOHE, 2012)

It is believed that, by measuring the learning environment temperature, humidity, lighting, and the amount of carbon dioxide (ventilation), this could determine the quality of the current facilities. In addition, it could outline the impact of current laws and legislation to control these factors, which could answer the research question about the efficiency and effectiveness of the current laws. It proves by scientific methods and specific figures whether these facilities need to be developed and addressed, and can also determine and identify their priorities. Therefore, a survey will be required to reach this aim. This part of the research may request the assistance of specialists or experts in some major areas such as lighting or ventilation, which is necessary to ensure that the study follows an appropriate mechanism for the measuring and verification of quality in a particular area.

After highlighting the gaps that may occur as a result of a lack of quality of spaces at PS KG buildings, this study will suggest some recommendations (drafts) to close these gaps. The importance of these ‘drafts’ is to consider them as the base that will be used later (added to the current missing design principles in PS KGs) to make a comparison with the universal terms and conditions of licensing KGs.

Based on the PS KG users' needs, this comparison will determine the regulations that should be used in the future PS guidelines, whereas other regulations will be excluded. Then, the new suggestions from this comparison will be discussed again with MOHE to view the possibility of their application in the short-term or long-term. The results of this discussion with MOHE will outline the final recommendations that will be submitted in this study. It is believed that working on achieving these new recommendations will provide the first step towards building solutions for addressing the PS KG problems in this field.

## 5.2. SUMMARY REPORT OF MEETINGS HELD ON JUNE 10, 2012 WITH THE DIRECTOR OF EDUCATION AND A HEAD OF GENERAL EDUCATION IN MOHE

Three meetings were held on 10 June 2012 with a Director of Education, a Head of General Education and a Head of Engineering Department in MOHE (MOHE, 2012). The objective of these meetings was to consider the latest developments concerning the relationship between the ministry and the KG in terms of licensing PS KGs buildings and supervision. This was in addition to having a close look at their future plans in the process of development of this sector and what their vision is for the future. Moreover, they aimed to review the results of field research, which had been carried out in 2011, and comment on them.

According to the Director of Education, the Ministry of Education oversees 90 KGs in Nablus Governorate[27] (MOHE, 2010). The ministry also has the responsibility for granting or renewing the necessary permits and licences to run this sort of educational facility. She pointed out that all KGs in Nablus City are run as private businesses under indirect supervision of the Ministry of Education, except for one KG that has been established by the national community. This KG was the only one that is run directly by the ministry like any public school in Nablus City, because it has been built as a model KG to prepare future teachers. She also noted that nowadays all KGs have to pay high annual state taxes (income tax) as for any private business, but there will be a proposal that will be discussed soon to

[27] By 2013/2014 the overall of KGs in Nablus Province will reach 125 facilities (MOHE, 2012)

work on reducing or exempting them from paying these taxes (MOHE, 2012).

According to the Head of General Education in MOHE, MOHE has a lack of laws relating to PS KGs. The written laws for licensing KG facilities were totally absent until late 2002. Then the ministry drafted new laws, which unfortunately were not officially approved and released until late 2009. In early 2010, the new administration decided to adopt the terms and conditions of licensing KGs that were proposed (late 2002) (Table 15). They worked on circulating them and then activating their items. The Head of General Education acknowledges that there are many abuses of these regulations but the ministry is working to overcome them as much as possible by focusing on two factors: safety issues and the qualifications of KG teachers at this particular stage (MOHE, 2012). The Head of General Education presented the ministry plan for improving the process of licensing the new KG buildings. In the next year, the ministry is planning to invite some ministries to participate in licensing them. This has occurred as a result of the difficulty of dealing with licence terms, which the ministry touched on when they started the phase of actual application. The ministry faced the complexity of provisions and disciplines operations based on their experience in the previous year. Therefore, they intend to work on the distribution of tasks by requesting the assistance of several government bodies that specialise in certain aspects of the licence. For example, MOHE will ask for help and support from the Ministry of Health to send a delegate to check if the new facilities reached their standards, which are related to health issues based on their experience in this specific field. In addition, there is a proposal to invite the Directorate of Civil Defence to send an inspector to work on the detection of the new KGs and how much they could achieve in terms of public safety. Then, depending on their reports and recommendations, the decision whether to grant a licence for these facilities will be taken. This plan is due to take effect starting in the academic year 2013/2014 (MOHE, 2012).

| Date | ~ 2002 | 2002 ≤ 2009 | 2010 ≤ 2012 | Future plan in 2012 |
|---|---|---|---|---|
| Building requirements for KG facilities in PS | Missed | Inactive | Activated | |
| Details | No regulations for licensing KG facilities in PS | Proposed regulations 'Inactive' | Active the old proposal from 2002 | Share responsibility in licensing KG facilities with other government institutions |

**Table 15: The timetable for the development of licensing requirements of kindergarten constructions in PS, since 2002 (Nimer, 2011).**

## 5.3. THE CURRENT GENERAL TERMS AND CONDITIONS TO LICENSE KGS IN PS

Since 2010, MOHE has been working on activating as much as possible the current regulations for licensing KG facilities, and they are planning to apply all of them within two years.

### 5.3.1. The current general PS regulations are as follows.

1. KGs consist of two stages preparation (for two years) before the first stage of primary school:
   A) Bostan Stage: children from the age of three years and eight months up to four years and eight months.
   B) Tamhedy Stage: children from the age of four years and eight months up to below six years old
2. It is prohibited to open any primary classes or others in KGs.
3. It is prohibited to open a nursery school/day-care centre in KGs.
4. KGs must work and be run by an active learning style only, and must not have more than four daily activities. Each activity must not exceed 30 minutes.
5. There is no homework.
6. There are no exams or marks, but there is a feedback for assessment.
7. The minimum number of children in any KG is 15.

8. The maximum number in a classroom that exceeds $35m^2$ is 35 children: $1m^2$/child. Moreover, in this case, two teachers should work together at the same time in such classrooms.
9. The director of the KG should work full-time if she has 60 children or more.
10. KGs should have a contract with a doctor for an annual health check for pupils.

### 5.3.2. The terms and conditions for licensing KG buildings in PS

**A) Indoor**

1. The minimum roof height is 2.8m for the classrooms.
2. Each KG should have a multi-activity room or a room that exceeds $20m^2$.
3. The flooring should be covered by tiles.
4. The building should be well-lit, have good ventilation and appropriate lavatories that meet the engineering and health requirements.
5. The KG building should be detached and have its own entrance, lavatories and its own outdoor play area.
6. KGs should be located on the ground floor and its building must not exceed the first floor tall.
7. The corridor must not be used as a classroom.
8. The KG building should have a proper kitchen.
9. There must be one lavatory per 20 children or fewer.
10. The lavatory and furniture should fit to a child's scale.
11. There should be proper water outlets for drinking that are fitted to a child's scale and should be installed far away from lavatories.

**B) Outdoor**

1. There should be $2m^2$ for each child.
2. At least 25% of the outdoor area should be shaded.
3. Any open terrace should be accounted for as a shaded play area.
4. The roof is not allowed to be used as an outdoor play area.

5. It is prohibited to install a manhole in the outdoor play area.
6. Part of the outdoor area should be used for planting flowers.
7. Part of the outdoor area should be covered to be used for sand games.

### 5.3.3. The KG furniture and equipment

1. A separate chair for each child's use.
2. Safe furniture that is designed for a child's use.
3. Display panels that are made of plastic or cork.
4. A cupboard without handles for each child to store her/his personal belongings; in addition, each cupboard must have a hanger for their coats.
5. Green/white board for writing and drawing, which should be installed at a proper height for a child's use.
6. Part of the multi-activity room should be covered by carpet.
7. The administration office and library should be furnished.
8. The kitchen should have the necessary appliances, cupboards and tap water.

### 5.3.4. Outdoor toys

1. Different types of swings and a variety of games.
2. The outdoor toys should be secure and safe.
3. They should be made of fiberglass and meet the safety requirements, taking into account keeping at least 3m between one game and another.
4. Three-wheel bicycles, small trolleys for children's use and other suitable toys.
5. Zone for sand games with clean sand.
6. Gardening tools that are appropriate for children.

### 5.3.5. Methods of protection and safety in KGs

1. Each KG must have fire extinguishers.
2. Each KG must have a first-aid kit that has a collection of all necessary supplies and equipment for use in giving first aid.
3. All KG buses and vehicles should be licensed and insured.
4. KGs should be free of obstacles such as barbed wire and stairs.

5. KG gates and walls should be safe and secured.
6. KG windows should be safe and secured
7. If the KG wall is too low, the KG should have a fence for protection.
8. Safe electric sockets should be installed at a high position.
9. All sorts of stairs should have a handrail, regardless of the number of these stairs
10. The main entrances must have barriers in front of them for protection.
11. Each KG should have more than one entrance to be used as an emergency exit.

## 5.4. Analysing the current general terms and conditions to license KGs in PS

It is believed that these regulations are considered a good step forward in having PS regulations for licensing early education centres, especially when compared with the situation in previous years. However, based on the field research (2011 and 2012) it can be said that they need more work to achieve their goals. First, these regulations ignore the importance of the KG's location. For instance, the KG facility itself should be located in a safe area, far away from any natural hazards such as falls, cliffs and wells, or artificial hazard areas which humans have created, such as factories with dangerous equipment. In addition, in PS's case, military hazards such as places that are close to military checkpoints, military bases or 'hotspots' near the Israeli settlements in the occupied Palestinian Territory must be avoided for the children's safety.

Some of these problems were revealed in the field study (2011), such as:

1. Educational facilities located directly on the highway, without a sidewalk or any kind of barrier (Pages 247 and 314).
2. A KG located on the front of a petrol station; there is even a case where a store is selling Liquid Propane Gas (LPG) cylinders inside the school building.
3. A KG located in an industrial area; there is an open plot for storage of heavy equipment and construction materials that is located directly in front of this KG. In addition, next to this plot and close to the KG there is a motor vehicle repair

workshop and another workshop for repairing and changing the wheels of all kinds of vehicles (Page 354).

The lack of laws focusing on the importance of KG location allows such KGs today to gain full licenses, despite the hazards that surround young children. Secondly, they are general regulations that may be ‘misunderstood’ by both landlords and inspectors themselves or even ‘avoided and abused’ by landlords, so it is believed they need clearer details and explanations. For instance, the methods of protection and safety section points out that each KG must have a fire extinguisher, but it is believed that this requirement misses some important details such as the following:

1. They should point out what types of fire extinguisher KGs should install: water fire extinguishers, $CO_2$ fire extinguishers, powder fire extinguishers, foam fire extinguishers, wet chemical fire extinguishers or automatic fire extinguishers.
2. What are the size and the number of these fire extinguishers that should be installed in KGs (because a 500m$^2$ KG building has different needs from one that is 80m$^2$)?
3. MOHE should also point out that fire extinguishers should be placed at strategic locations throughout the building, to be accessible and usable at all times. Although this may seem self-evident, the first pilot study in 2009 shows the high rate of expired extinguishers at KGs that are not valid for use (see the first pilot study findings in 2009).
4. The fire extinguishers should be subjected to periodic maintenance and inspections by specialists. For instance, MOHE may require KGs to have a maintained contract for their fire alarm system.
5. Every member of KG staff should be trained how to use the fire extinguishers.
6. The new expiry date must be recorded clearly on the extinguishers, and the method of use should be shown on them or where they are installed.

Another example is the fifth and the sixth items in the current PS regulations (Methods of protection and safety in KGs) which point out that gates, walls and windows should be ‘safe and secured’, without a clear definition of what could be considered ‘safe and secured’ or how they could be achieved by the KG principals/landlords. The same problem can be noticed in all underlined text in the current PS regulations (Pages 224 and 226). Thus, even if a KG is looking forward to developing its learning environment based on the current PS regulations, this ‘licensing guide’ cannot guide the KG towards its goal. The same situation has been seen in the first-aid kit, lavatories, and water outlets for drinking conditions, etc., (inspection 2011). It is believed that as a result of the general nature of these rules, the majority of current MOHE regulations are not only easy to avoid and bypass but also ineffective (PS KG case studies 2011).

Furthermore, based on the field study (2011 and 2012) it is believed that they are not applied well, because PS KGs do not have to do so , and by avoiding applying these rules they can save money or even gain more profits. For instance, if a KG has rented or borrowed an empty 1kg fire extinguisher for a licensing day only, which must be pre-arranged and well-known for all parts (Page 223), the KG could pass this test easily. The KG could pass this test even if its director was hiding the empty extinguisher or storing it far away from the storage area or in his drawer; it would not matter, as he could show it ‘on time’ when an MOHE investigator asked.

### The lost key points that can be concluded are:

1. valid for use
2. the ease of use and the ease of access to it when required
3. commensurate with the nature of the place and its size
4. periodic inspection and maintenance
5. must meet both the KG and their children needs

In addition, the above information reveals another factor that exacerbates the existing problem. In the previous case the KG not only could pass this test and get a full licence for this year or for the next five years, but also could have a permit that is valid permanently, as long as: they do not ask to add any extra rooms, increase their capacity in the future or the parents of the children do not submit formal complaints against a specific KG.

Therefore, regardless of the argument raised about the ineffectiveness or usefulness of PS current terms and conditions, there is no proper mechanism to monitor the implementation of these laws. Although an MOHE investigator will visit the PS KG that is applying for a licence, in order to inspect its ability to meet the defined requirements, if the facility meets all MOHE requirements it will be granted a full licence for the next year. After this year, the granted licence will be renewed automatically every year if the landlord pays all the required fees and taxes. The problem is, according to PS regulations (2010) this annual renewal occurs without any sort of site inspection of the facility. It is not expected to do any sort of verification of the facility unless the landlord requests to add a new classroom or increase the KG capacity. Not only is the first inspection of the educational facility by prior arrangement with the landlord/director of the KG, a second field inspection of the facility will not take place unless it is requested by an owner of a KG who has asked for expansion or modification of the building. Spot checks do not usually occur unless MOHE has received complaints about a particular facility (MOHE, 2012). Regardless of the financial and administrative corruption of the PA (AMAN, 2009), this gives KG facilities opportunities for evasion, fraud, and negligent application of the law.

According to MOHE (2011), the above methodology of licensing and inspections are a result of: the lack of transportation methods in the ministry (‘vehicles and drivers’ which are necessary for the field inspections), due to the tight budget; the lack of specialists in early education facilities at MOHE (trained inspectors and full-time KG building inspectors); and the lack of a special/separated section in the ministry competent in the early education field.

It is assumed that more details and explanations may help in supporting the current laws by providing the key players with clear conditions that are expected to be achieved, which will reduce the cases of misunderstanding. Moreover, it should reduce the phenomenon of circumventing the law by making it more difficult, and also reduce the ability to abuse application of the laws.

For instance, more details and explanation are needed about what could be considered safe furniture that is designed for a child's use, or the accepted toilet specifications that could be considered suitable for children of this age (Figure 111 and 112) (Table 16).

This kind of information could be forwarded to KG landlords, who want to get a new licence or renew the current one, as a recommendation and advice. For instance, there is one condition saying the lavatory and furniture should fit to a child's scale. Some simple drawings and layouts that show the expected specifications (such as the minimum and maximum height and width) of a children's lavatory could be helpful for non-specialists to follow these recommendations and install them as well, as being used as a reference by investigators to build their judgement.

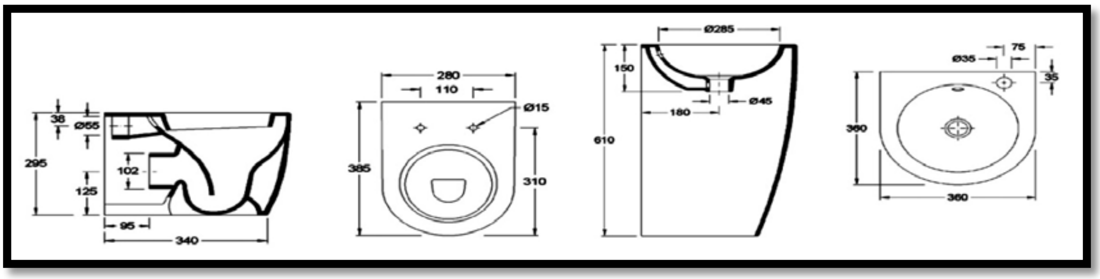


**Figure 111: Layout shows the accepted height and width of toilet kits (Example ONLY)**

| Age Group | Water Closet | Toilet Seat Height | Grab Bar Height | Dispenser Height |
|---|---|---|---|---|
| Ages 3 < 4 | 12 in (305 mm) | 11 in to 12 in (280 <305 mm) | 18 in to 20 in (455 <510 mm) | 14 in (355 mm) |
| Ages 5 < 8 | 12 in to 15 in (305 < 380 mm) | 12 in to 15 in (305 <380 mm) | 20 in to 25 in (510 <635 mm) | 14 in to 17 in (355 <430 mm) |

**Table 16: Specifications for water closets, toilet seats, grab bars, and toilet paper dispensers (Cannon, 1998, p. 2086)**

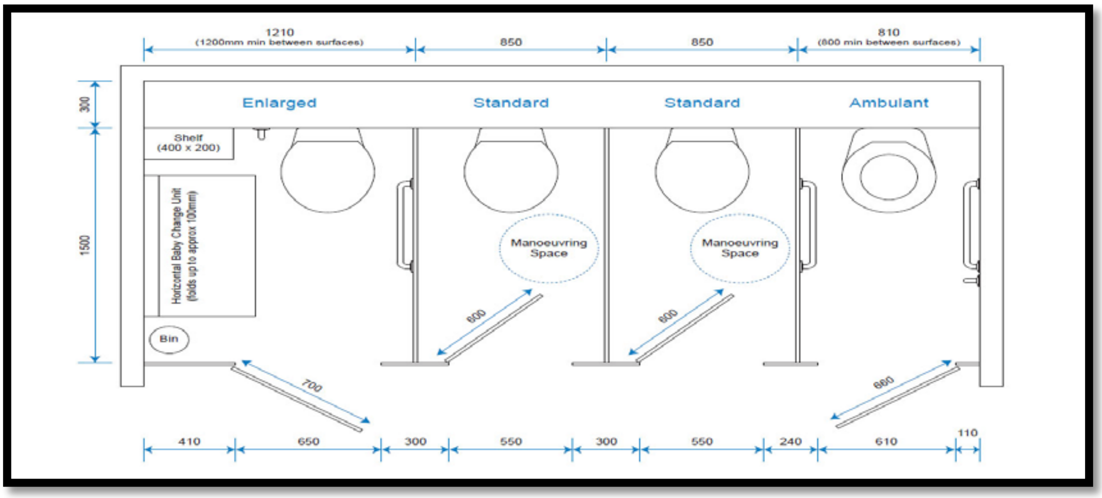


**Figure 112: An example of missing details that could be forwarded to the PS KG landlords by MOHE to be used as a guideline helping them to achieve the minimum standards of design in such place in their facilities (Cubicle Centre, 2010), (Example ONLY).**

## 5.5. Summary

It is believed that, in order to fill the gap in certain KG building regulations in PS, the MOHE should work on drawing a clear framework that must start with determining the aims of this licence, which PS KGs may achieve by applying their requirements.

It is believed that MOHE should first highlight the keys to success that can support these aims. Then, the keys to success should lead to the main principles, whether derived from the local environment and experiences, or universal principles derived from the global experience in this field.

These principles should determine the main key factors that are vital for identifying their effective variables and constants (Figure 113). In addition, the importance of these key factors is that the first challenge of future KG building regulations will be to work on controlling their elements to ensure the maximum benefits from their positive impact, not only on the key factors and principles but also on the main aims of the regulations, while working on avoiding any potential negative effect that may result from ignoring the impact of these effective factors.

The future KG building regulations will cover and support the effective variables and constants; it is believed that these regulations should be clear, detailed and accurate. Moreover, MOHE should not only enhance these regulations by providing the user (KGs) with clear layouts, simple guidelines, and cheap alternatives that are easily obtained from the local market at reasonable prices to achieve their terms and conditions, but should also provide them with guidance and supervision by specialists and technicians in this field to work together to achieve their goal towards guaranteeing the quality of the learning environment in PS KG facilities.

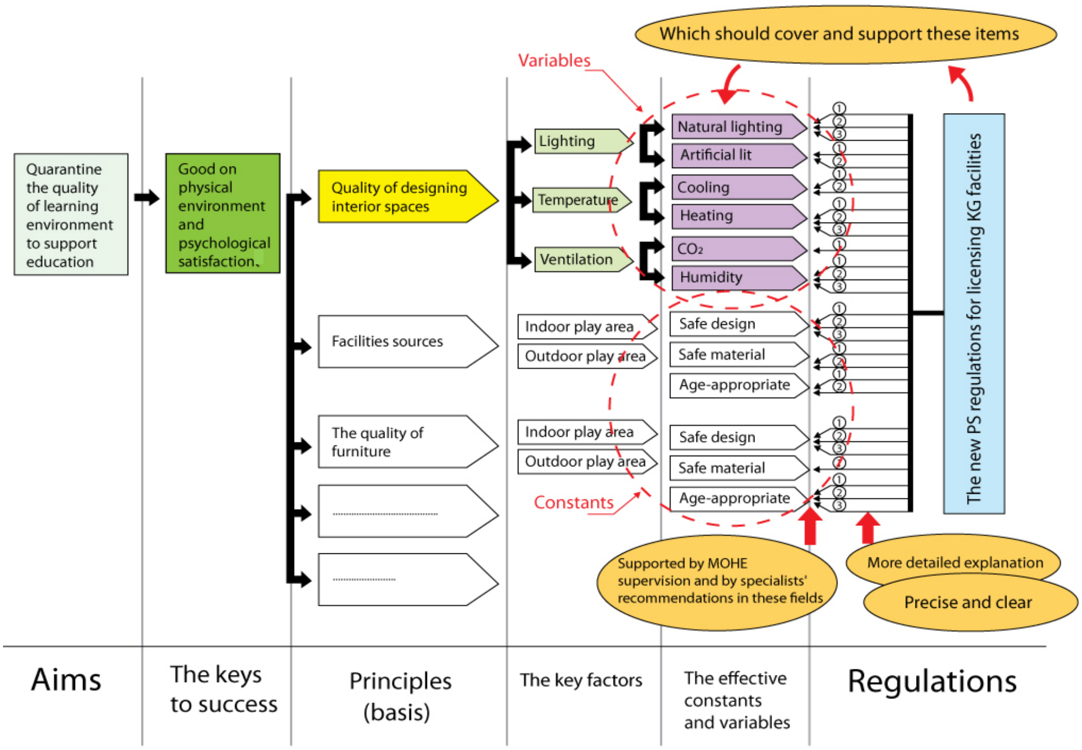


**Figure 113: An example of the pattern of the suggested framework that is believed MOHE should follow to reach success in writing any featured regulations.**

Therefore, based on the above, it is believed that the ministry must first agree on the fundamentals that make up the general outlines. Then, it can move to more specific points by dealing with details. For instance, they need to identify what can be considered 'safe or proper' in MOHE regulations by giving a clear definition and more details about these points. In addition, at this stage it can be pointed out that the current 'vague laws', where words are capable of having more than one meaning or interpretation, do not serve the goal that was set up or serve the interests of all concerned parties. Thus, this will deprive the key players of reaping the gains of these regulations.

# Chapter 6 : CASE STUDIES ABOUT PALESTINIAN KGS

## 6.1. THE AIM OF CASE STUDIES IN PS

The main objective of the case studies in PS is to demonstrate whether the criteria which are currently used in the licensing of KG buildings are able to provide the minimum quality of the educational environment (the quality of space). According to MOHE these criteria have been established to serve this goal. Therefore, the next case studies in PS will aim to:

- Illustrate the current situation, difficulties and problems which may face the PS KG in terms of the space quality and design. This will outline the weakness points that should be addressed via the future regulations and design.
- Identify the impact of the current licensing regulations on the quality of space in the PS KG facilities, which will highlight the effectiveness of these regulations.
- Identify the PS KGs' commitment to the current PS regulations, which are related to licensing their educational buildings.

It is believed this will clarify how the weakness of formulation and the generality of current regulations have led to the failure to achieve the desired effect, by their ease of bypassing and circumvention. Moreover, it will be vital to expose any deficiency in these laws, which are not covered yet, despite of their importance.

In this study, the first step towards establishing new licence regulations in PS was by understanding the users' building problems, difficulties, and needs. The second step towards establishing new licence regulations is by understanding building 'KG' problems and their causes, the impact and consequences on the users and the aims of the establishment of this facility.

Therefore, these case studies will cover: KGs' background (history/pattern/structure/ and materials); the general external and interior views of the KGs; the layouts; pupils' lifecycle in the KGs; and the quality of spaces (light, temperature and air quality). All chosen KGs in this case study have been taken from the West Bank in PS, specifically from the Nablus Governorate. The chosen KGs were selected according to the number of students that enrolled in the last academic year (2010/2011); they were also chosen according to their building style – modern/traditional. All KGs are located under the supervision of MOHE in Nablus and are located within the auspices and the supervision of the same Directorate of Education office in ministry. All KGs had the same tuition fees[28] for the academic year 2010/2011.

## 6.2. THE LOCATION OF THE CASE STUDY

The Palestinian city of Nablus, which is the capital of the Nablus governorate, is located within the Administration of the Palestinian Authority. It is a typical Palestinian city in the northern West Bank, approximately 63 kilometres (39 miles) north of Jerusalem, with a population of 126,132. Nablus City is located in a strategic position between Mount Ebal and Mount Gerizim. It should be pointed out that it is not only considered the capital of the Nablus Governorate[29] but also considered the Palestinian commercial and cultural centre (PCBS, 2008).

In the last five years there has been a kind of relative calm in the West Bank, especially in the Nablus area, since the escalation of violence in 2001. This could have helped the area to regain relative stability, which has led to a refreshment of Palestinian economic growth. This has also led to the local government, as well as private companies, shifting their plans from survival plans in exceptional 'conflict times' to reconstruction and development plans.

[28] $20.50 per month for each child
[29] The population of Nablus Governorate was 320,850 in 2007 (PCBS, 2008)

## 6.3. THE FRAMEWORK FOR THE CASE STUDIES

| First case study (EL) KG | Second case study (EM) KG | Third case study (MY) KG |
|---|---|---|
| Converted to a KG from three traditional buildings | Converted to a KG from a modern building that still has some traditional features | Converted from a modern building |
| Originally built between the 1920s and 1940s | Originally built in the early 1950s | Originally built in the early 1990s |
| From the 'old school' in building in PS | From the 'middle-era' between two schools in the PS building | From the 'modern school' in building in PS |
| Built from traditional materials | Built from mixed materials | Built from modern materials |

Table 17: The sort of KGs that will be covered in the PS KG case study

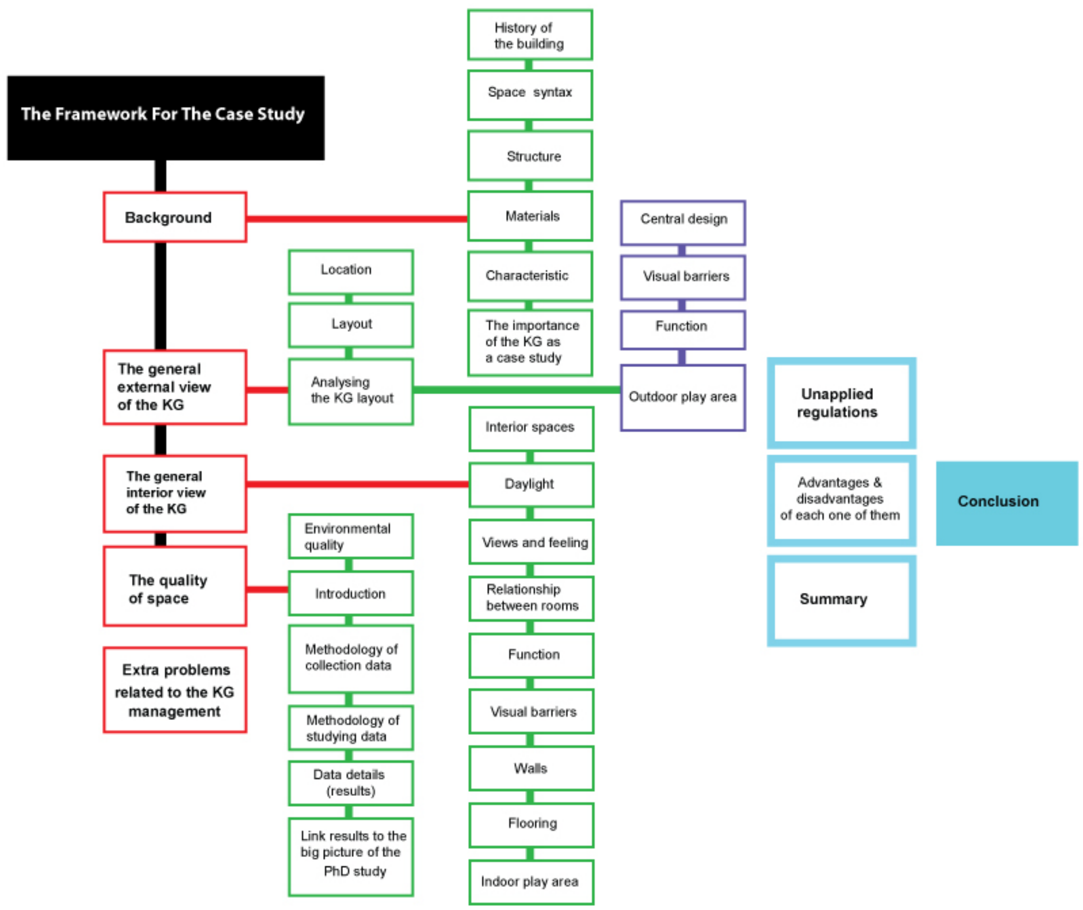


Figure 114: The framework of the PS case studies

## 6.4. THE FIRST CASE STUDY: (EL) KG

### 6.4.1. The importance of the (EL) KG as a case study

The KG has taken advantage of the Qatari grant ($15,000), which aims to support KG facilities in PS by developing the learning environment. The sponsor has stipulated in advance that the grant must be under the supervision of an engineer, who will be appointed by him from the local community, to ensure the maximum benefits of using this grant (Owner, 2011). Therefore, this engineer has the responsibility to design and supervise the refurbishment, which explains the high level of achievement in terms of the outdoor quality, later in this case study. The architect's input and the exceptional producers and financial support in this case may ensure that the average quality level is much higher than other rivals.

However, it is believed that this KG is important for this study for many reasons. First, it is a typical KG that has been converted from a PS traditional house (type one)[30]. Type one has been targeted mainly by the investors in the early education field for many reasons that have been presented earlier in this study, which can be summarised by its location, outdoor spaces and cost. These reasons lead to the majority of KG buildings being from type one and two. Therefore, this KG is considered a good example as it was originally built as a traditional PS house (type one). The second reason for choosing this KG is to show how the lack of money, which is usually used as an excuse to justify the lack of safety issues and poor healthy learning environment at KG facilities, is not the real reason that stands behind this problem (MOHE 2012) (Page 143). It is believed that the lack of awareness of the importance of these issues and how to apply them are the roots of the problem because, despite the Qatari Fund, this KG still shares with other PS KGs in this study the same problems – more or less – that are related to the quality of space. The aims of this study will be achieved by showing how this KG failed to exploit the generous grant in the best way to deal with the difficulties it experienced, despite the cost of treatment not requiring large sums of money.

[30] Regarding the building pattern and materials that have been used in its structure

However, the KG needed to be convinced of its importance first and then figure out the necessary means to apply the most appropriate methods to reach a safe and healthy learning environment. The third reason was, besides its location in the study area and it requiring the same amount of tuition fees, the number of enrolled students was 60 pupils, which is the average number in PS KG facilities (MOHE, 2012). Thus, it is not too small or too big.

## 6.4.2. Background of (EL) KG building

### 6.4.2.1. History of the building

The KG consists of three PS traditional houses, which were built between the 1920s and 1940s. These houses were inhabited by three brothers, who were farmers. The majority of Palestinians in this period were considered ‘the ordinary people’, with low and middle class backgrounds. Thus, their houses are simple in structure, materials and decoration.

One of the owners of these houses decided later to convert his own building to a kindergarten facility (Figure 128: Room 10). Then, in 1996 and 2010, the KG landlord rented the other houses (Figure 128: Rooms 5 and 1 respectively) expanding her business by converting the others houses ‘rooms’ to classrooms, by joining them to main structure. This operation was not difficult or expensive because all old houses shared the same backyard and fence, which was important for protection purposes and raising the privacy of these building as one unit as long as all owners shared the same root ‘extended family’.

### 6.4.2.2. Space syntax

According to Shokry Arraff (1985) and Omar Hamdan (1996) there are three types of PS traditional buildings, which can be divided depending on the topography of interior spaces (Appendix 4). This simple house is considered type one because it originally consisted of one to three rooms and its size is between $24m^2$ and $65m^2$. It was inhabited by workers in the local industry or farmers, who were the majority of the Palestinians, ‘the ordinary people’. Those people were considered low and middle class in the past. Thus, the buildings are simple in their structure, materials and decoration.

These houses were built without unnecessary ornamentation or sophistication which could have increased the cost of the building, because the original owners of this type of house usually tried to keep the cost down.

According to Diala Khasawneh (2004) type one is considered inexpensive and often consists of one room to three rooms. Its windows and doors are quite small in order to reduce the cost, and were usually purchased separately. Ordinary people did not have enough experience and ability to make them, in contrast to the actual construction, which was built by the owner of the house with the help of his extended family and his neighbours. These houses were built without unnecessary ornamentation or sophistication which could have increased the cost of the building, because the original owners of this type of house usually try to keep the cost down.

Each house consists of from one (Figure 128: Rooms 5 and 1) to two rooms (Figure 128: Room 10), which were built from local materials. These materials, such as stone and lime, are available in their local environment.

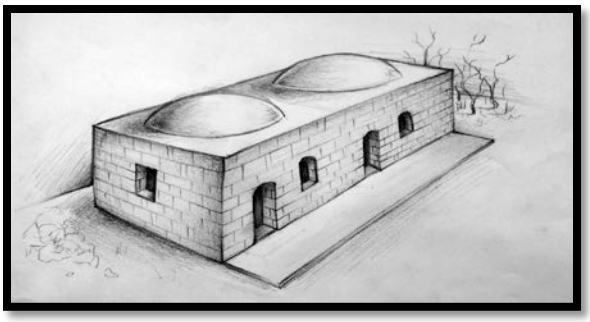

**Figure 115: A PS traditional house (Type one), 1920s, which is similar to room No. 10 and 11 in the (EL) KG layout (Figure 128). This picture is just to show the form of the building**

### 6.4.2.3. Structure

Traditional PS houses (Type one) ‘such in this case’ are not usually enough by themselves to be converted to KG use as a result of their small size and distribution. Thus, if they are required to be converted, they often have to have some rooms added, such as lavatories and a kitchen, and they often need a lot of maintenance work before they can be used as an early educational facility.

Therefore, today, the brothers' building consists of two floors: the ground floor 'original houses' and the first floor. The ground floor is a typical traditional building (type one) that was built from white stones, lime and earth with an 'Aqid' style (Figure 115 and 118-121) and thick walls (Figure 116, 96 and 98), whereas the first floor is a modern style, and has been built from concrete blocks with a roof. The ground floor is used as a KG, while the others have been used as private houses. It should be pointed out that the current landlord of the KG and her two brothers share the same main gate, entrance and even the main hallway with the students. In other words, there are three attached houses for the landlord and her extended family, who share the same KG entrance in this building.

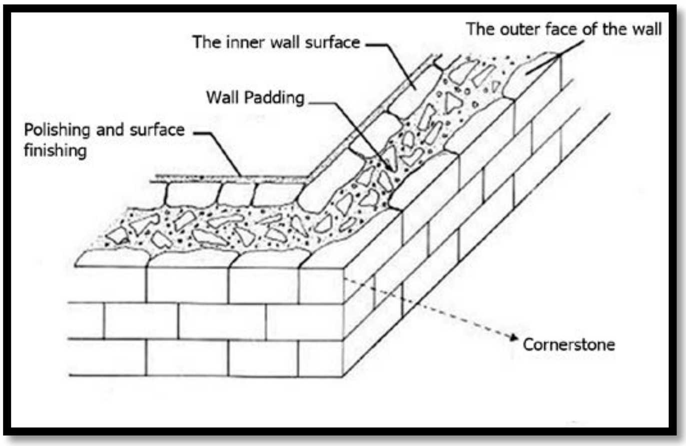


Figure 116: Section in a wall in the (EL) KG, that shows the components and method of construction, (Hamdan, 1996)

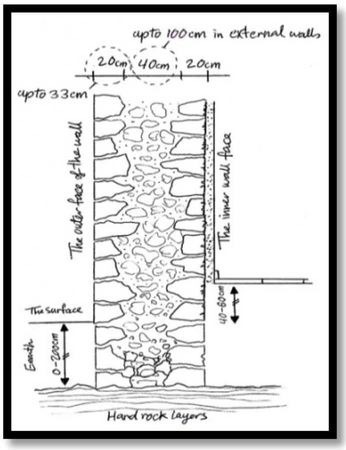


Figure 117: The thickness of construction walls in (EL) KG

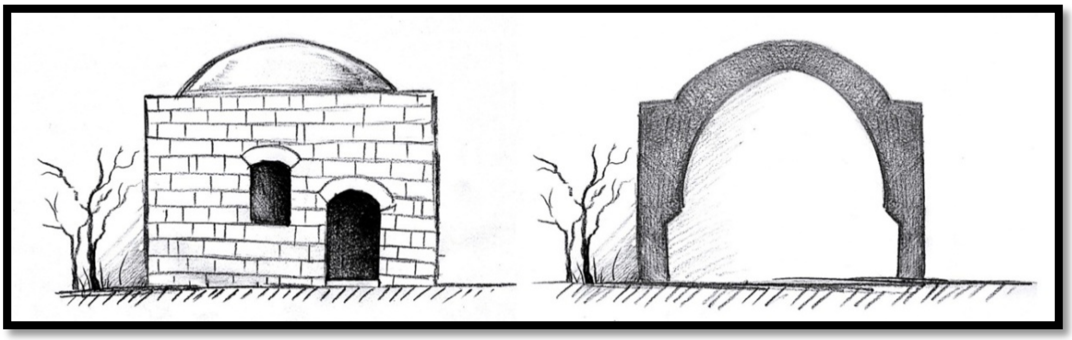

Figure 118: Section in an 'Aqid' room, room No. 5 in the (EL) KG layout, the second classroom

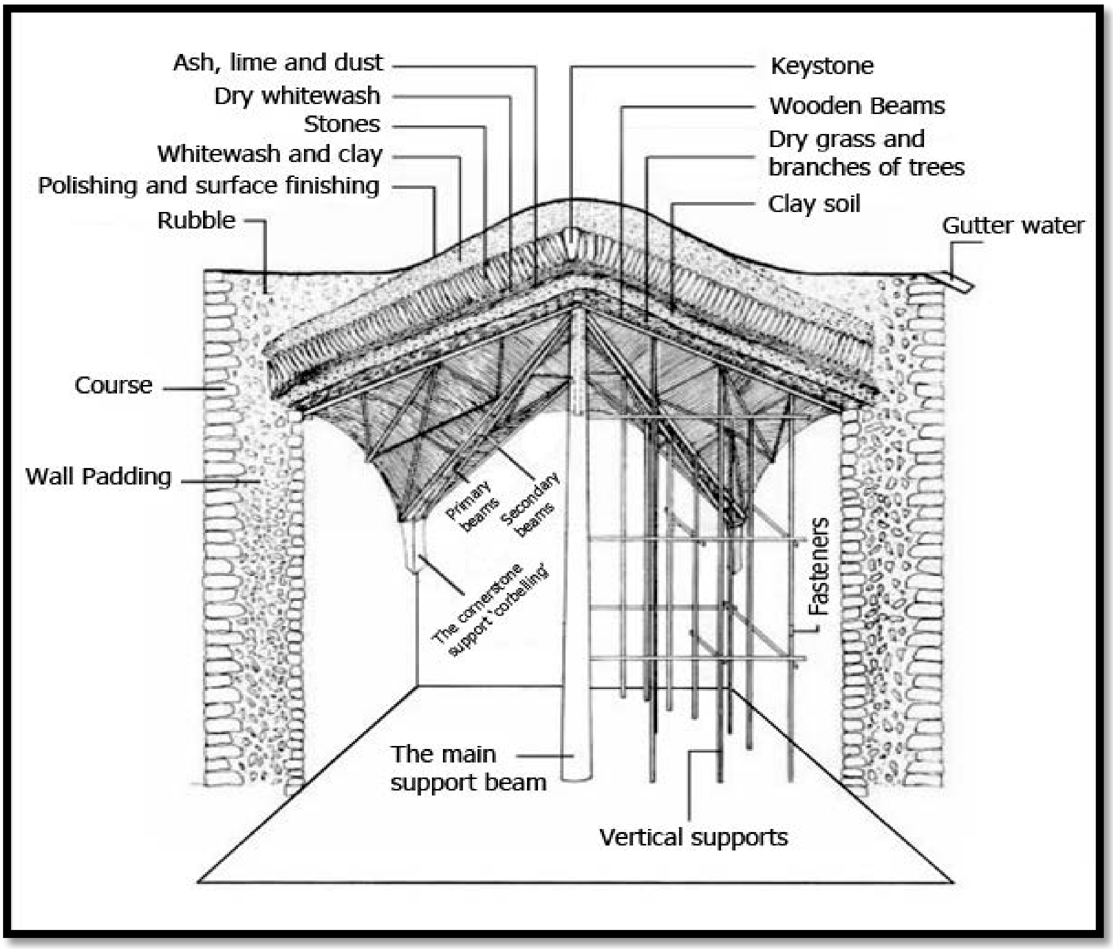


**Figure 119: Section in a traditional house in PS 'Aqid' style** [31]

**Figure 120: An example shows the materials and contracture of 'Aqid' style in a simple PS traditional house (Type one) in Alkasaba, Nablus.**

**Figure 121: Section shows the building methods in distribute the load in 'multi-storey' the traditional building in PS. Nablus City (2005)**

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[31] Note: all types of wooden support beams will be removed at the end of building process, photo based on Omar Hamdan's layout (Hamdan, 1996)

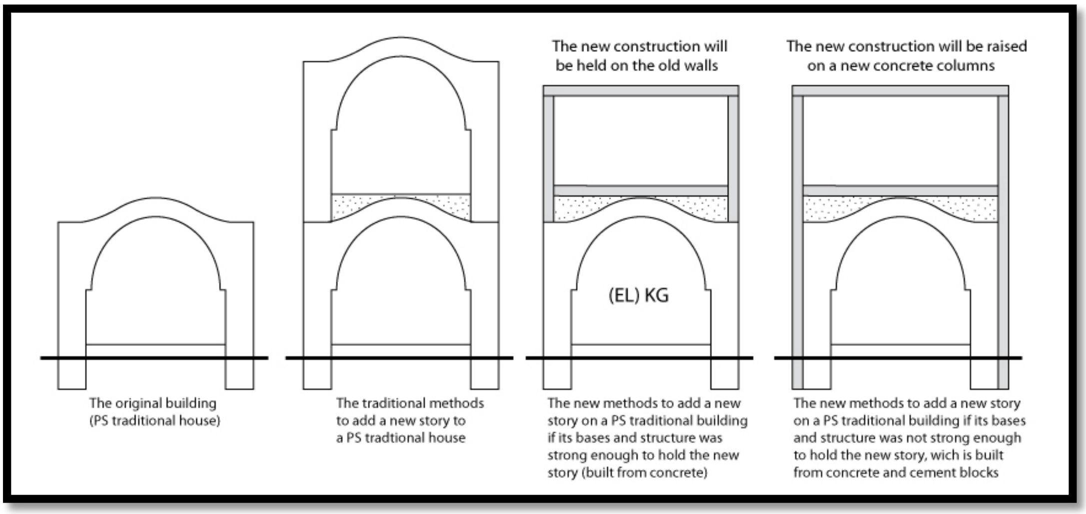


**Figure 122: The methods of adding a new storey to a PS traditional building**

Figure 122 shows the methods of adding a new storey to a traditional building in the 'Aqid' style. Whether the new storey is a traditional or a modern building depends on the current condition of the traditional structure and the durability of its thick walls. These walls will hold the load of the new construction (the second storey).

The KG has been fenced by a high concrete wall (approximately 2m high), which was built to protect pupils (Figure 123 and 127). Yet the poor condition of this wall, which was built using little chunks of cement and a lot of sand and rocks, causes obvious concern for road users. There are concerns that the wall may cause danger to the children, because it may collapse at any moment. Some incidents have occurred as a result of some parts of it collapsing; fortunately no-one was hurt (Figure 123). Since the occurrence of these incidents, this wall has been refurbished, but it is believed it was done in inappropriate ways. A lot of cracks appeared after a few months of finishing the last maintenance works. Thus, the KG's

**Figure 123: The footpath between the KG entrance and classrooms, A high wall surrounded the (EL) KG, which is a visual barrier (Figure 132)**

administration is looking forward to rebuilding it as soon as possible. As in all PS traditional houses (type one) it is easy to notice the limited number of openings and their small size, which was necessary to reduce their installation and maintenance costs, and heating costs in winter, to facilitate the defence of these houses, and to increase the privacy factor (Figure 115).

One of the main features in this building is its wide walls, which consist of two thick stone layers. The gap between these two layers has been filled with rocks, lime and earth. These integrates have been mixed with water and oil. These walls are between 80cm and 140cm wide (Figure 117). The second feature is the ‘Aqid’ style (Figure 118-122 and 136-138) that can be seen in KG classrooms. The ‘Aqid’ style is a traditional element in PS houses, especially in those that were built before the 1940s. This structure and thick walls keeps these kinds of traditional houses cool in summer and warm in winter. Today nobody uses this style in modern building because of the high cost of these methods. Moreover, the widespread use of cement instead of lime may lead to the disappearance of this form of unique construction in PS.

#### 6.4.2.4. Materials

According to Omar Hamdan (Hamdan, 1996) and Diala Khasawneh (Khasawneh, 2004), the raw materials that have been used in PS buildings are varied and they have played an important role in architecture since ancient times. They have proved their durability and resistance to climate change and elements over the ages, as well as their responsiveness to the needs and desires of the residents in all categories, depending on their availabilities. The availability of these raw materials in the local environment leads to technical personnel and skilled workers capable of dealing with these materials professionally.

These architectural materials in PS society have an impact on the architectural compatibility of buildings and harmony with the local environment, climate factors and social factors. They meet PS people’s needs in the simplest and cheapest way with the highest possible quality (Abuhannoud E. , 2006).

**Building materials** (Hamdan, 1996) (Sholy, 2004):

White stone is available in the local environment and the ordinary people, landlords themselves and their extended family, used to cooperate together to collect these stones from the same town/village, whereas the richer people used to employ people to do this. The white stone that is used in this building is considered hard and has a desirable colour.

(EL) KG was originally built from traditional materials, which consist mainly from the white stone. This type of lime stone was been used in building the whole structure. The stone in this building has been taken from the same aria, which is lies 1.15km from the construction site. Water and oil were mixed with earth, ash and lime to be used in many places in these buildings such as roofs, plastered walls or to fill small gaps between stones.

Olive oil is one of the traditional materials in all PS traditional houses, so it can be seen in all types of PS houses more or less depending on the purpose of the building and wealth of its owner. Although olive oil is considered an expensive material to be used in structures, the abundance of olive trees and the oil harvest in all categories of farmers, who were in that time (the majority of PS people), enabled them to use it in abundance at the time. In addition, olive oil is the main crop for most families in the West Bank (especially in this region), which makes it affordable and easy to obtain. The importance of mixing olive oil is to raise the insulation of the building's 'roofs and walls' (Amiry S. , 2003). It is believed that olive oil increases the durability of construction and makes the mixture last for 'hundreds of years' (Sholy, 2004). It should be pointed out that the abundance of olive trees in the mountains of this region explains not only the wide use of olive oil in the building structures in this region but also the wide production of lime, which needs free or cheap sources of raw material (lime) and the necessary sufficient of fuel (wood) for the incineration process.

In this building, wood was used in the moulding process '*Aqid'*. The wood panels was been taken from the stems of trees available in the closest forest, such as 'Alhurush' forest that lies

1.7km[32]. In addition, wood are used in the doors and windows, and the production of furniture.

The ash, lime, earth, water and oil mixture has been used in smoothing roofs, domes, and terraces, whereas earth and lime were used for plastering the internal walls. In addition, lime powder was mixed with water for internal painting works, which gives inner walls and ceilings a pure white colour (deepening with the quality of the lime).

Today, the majority of converted KGs are originally type one and two PS traditional houses. However, as a result of growing families, those who originally inhabited these traditional buildings found it necessary to attach rooms in different eras. Moreover, type one has only one to three rooms, which is not enough for a KG, and building new attachments such as lavatory spaces or usable storage space in a KG is required. These two vital factors lead to finding converted buildings for KGs with a variety of styles and building materials, depending on their age. This explains the overlapping of more than one style of building and the use of a variety of materials, which can be seen in this case study.

#### 6.4.2.5. Characteristic

- (EL) KG was been visited by researcher on 21 June 2011 and in December 2011
- Fully licensed KG
- Licensed to serve up to 60 children (received 69 in 2010/2011 and 47 2011/2012)
- Three teachers (including the landlord) and one for cleaning service
- KG building consists of a group of three PS traditional houses (type one), which are collected as a KG. Each one of the traditional houses originally had only one or two rooms.
- ‘Aqid’ style
- The building is owned by the KG administration (except for one classroom that has been rented)

[32] The traditional road, whereas the new road that has been used widely since 1950s lies 2.91km

- The building has been refurbished and one classroom was added (rented) in 2010
- $15,000 has been granted to the KG by Qatar to renew the building; it was a part of the scheme to support childhood in PS
- Pupil's life-cycle at (EL) KG

<table>
<tr><th rowspan="2">Time</th><th colspan="6">7≤8</th><th colspan="6">8≤9</th><th colspan="6">9≤10</th><th colspan="6">10≤11</th><th colspan="6">11≤12</th><th colspan="4">12≤13</th></tr>
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<tr><td>22 Dec 2011 25+16 children</td><td colspan="3">Open the facility to receive children</td><td colspan="4">Morning assembly</td><td colspan="3">Teaching Quran</td><td colspan="6">Breakfast and rest inside the class (TV)</td><td colspan="3">Singing</td><td colspan="4">Mathematics</td><td colspan="4">Play outside sand games</td><td colspan="3">Painting</td><td colspan="4">Start leaving for home</td></tr>
<tr><td>26 Dec 2011 25+17 children</td><td colspan="3">Open the facility to receive children</td><td colspan="4">Morning assembly</td><td colspan="3">Reading</td><td colspan="6">Writing (exam)</td><td colspan="3">Homework</td><td colspan="6">Play outside and Breakfast</td><td colspan="3">Mathematics</td><td colspan="2">Dancing and Singing</td><td colspan="4">Start leaving for home</td></tr>
<tr><td>27 Dec 2011 27+20 children</td><td colspan="3">Open the facility to receive children</td><td colspan="4">Morning assembly</td><td colspan="3">Reading (Arabic)</td><td colspan="6">Teaching Quran</td><td colspan="3">Writing</td><td colspan="6">Breakfast</td><td colspan="5">Playing outside</td><td colspan="4">Clay</td></tr>
</table>

**Table 18: Pupil's life-cycle during the experiment days (22, 26 and 27 December 2011) at (EL) KG and for all classrooms**[33]

The pupils' life-cycle table will be linked to the quality of space. In other words, the sort of classroom activities will be linked to: room temperature, humidity level,, the $CO_2$ rate and the amount of lighting inside these classrooms. This relationship will be monitored and recorded.

[33] The same schedule (3 days) is repeated throughout the week and for the whole KG year

### 6.4.3. The general external view of (EL) KG

Figure 124: The (EL) KG. Photo by Google Earth 2011.

Figure 125: The front view of (EL) KG

Figure 126: Inside view of the main entrance. The stairs lead to the second floor (a private house)

Figure 127: The main way to classrooms

#### 6.4.3.1. Location

The location was one of the main reasons for choosing this building to be converted to a KG. It is located in the boundary areas between the town's commercial centre and the ancient archaeological area, the old town. In addition, it is very close to modern populations (Figure 124). These active and crowded areas seem good sources for potential 'customers'. On the other hand, the KG is located directly on the main road without a pathway or any kind of barrier that can prevent children from rushing directly towards the street (Figure 125). This situation may expose pupils to the risks of the road, such as automobile accidents.

#### 6.4.3.2. (EL) KG's Layout

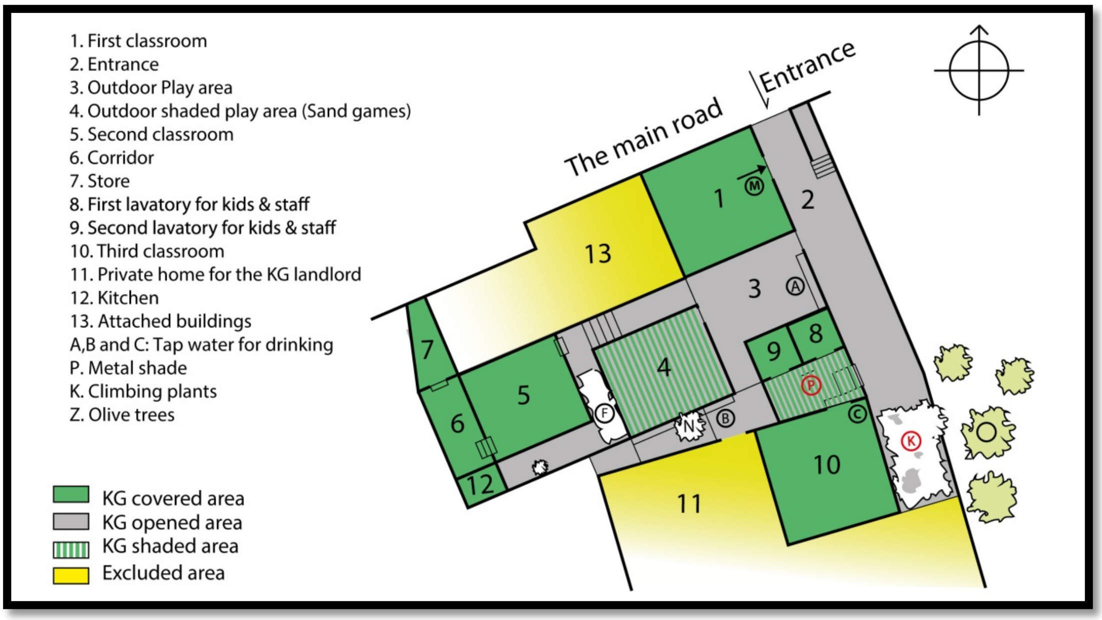


Figure 128: The layout of (EL) KG

This KG has a beautiful sand game area that is shaded by steel sheets (Figure 129). They have used a thick layer of sea sand, which was clean and soft, to cover the ground (Figure 130). The majority of toys that are installed in the sand area are age-appropriate for young children, because they are safe for children to use with no sharp angles and hazardous materials. The sand area was colourful, spacious and easy to access by children and be monitored by staff (Figure 131).

Figure 129: Steel sheets for shading sand area

Figure 130: Shaded area for children to play sand games

#### 6.4.3.3. Analysing the (EL) KG layout

**Central design**

The KG plan shows a KG design centred on the outdoor play area (sand games), which has been surrounded by the classrooms (Figure 131). The sand games area is located in the centre point, where all pupils meet and play.

The majority of outdoor play actives occur in this area, which according to the KG director has become one of the favourite zones at the KG (MOHE 2012). The sand games area is easy to reach from two classes, but not class number 3 (Figure 131). Classroom number 3 needs to relocate its door to the south side. This will enable KG staff to more effectively monitor young children as well as more successfully control the main entrance. This design has resulted from converting

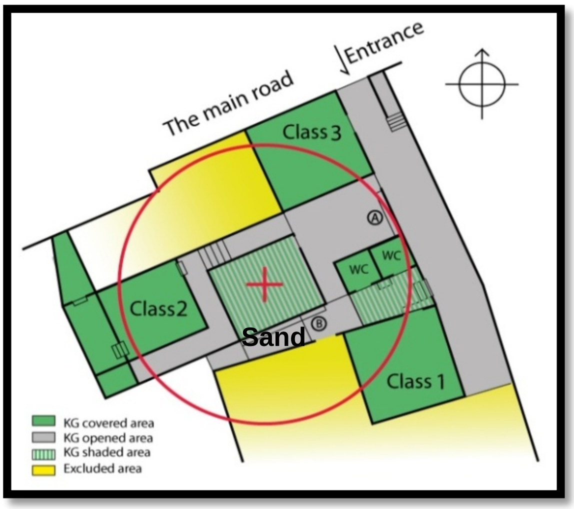


Figure 131: The relationship between the classes and the main gathering point and play activities

three traditional houses from type one into a KG facility. Each one of these classrooms was originally built as a PS traditional house. Therefore, it is easy to notice the PS features in the building such as domes, thick stone walls and the 'Aqid' style. Despite spending $15,000 on refurbishing and developing this KG, the building still keeps its traditional pattern and style (Figure 115, 136 and 139).

**Visual barriers**

As a result of targeting old houses from type one to be converted to KGs, the plan shows that some problems have shifted to the (EL) facility. For instance, the lack of eye contact between inside the classrooms and the outside environment becomes an issue in this facility. The building has been surrounded by many attached buildings in the south, west and the north-west. Moreover, the high wall (approximately 2m high) in the east is considered a barrier, which has left only the north side open (Figure 132: D).

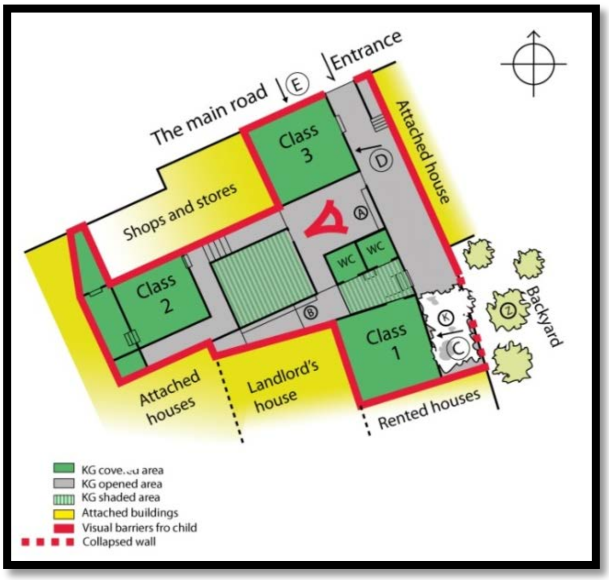


Figure 132: Visual barriers. No eye-contact for young children with their external environment.

It is not useful in this issue because this side of the building has very high windows that cannot allow children to view the road (Figure 143). The same situation occurs for windows on the east side that face the wall (Figure 132: C and D). In addition, the climbing plants in this area obstruct vision and the sun light (Figure 127: K).

### Function

The plan shows that the KG has no ability to receive disabled people (wheelchair users), although the KG director/landlord suffers from a physical disability (70% of her body)[34]. The KG has multi-level storeys (Figure 133) with inappropriate stairs and threshold scales for ordinary adults and children alike. This does not make the life of the KG director easier and also turns the KG daily activities into a real challenge, which she has to face every day.


**Figure 133: Multi-level storeys**

Although the KG director has about 30 years of experience in the early teaching field, spent with her physical disability, she could not take advantage of the received fund to solve this essential obstruction.

Removing these barriers by installing new ramps, or even by matching the storeys' levels as much as possible, would not only help to resolve the director's problem but also support all potential students and their parents who may have permanent or temporary physical disabilities, especially wheelchair users.

[34] According to the official KG landlord's medical report that was submitted to MOHE in 2010

**Plants in the outdoor play area**

The KG has two trees: a grapevine and an orange tree, which provide shade for the outdoor area. However, the grapes could be dangerous because children may pick the fallen grapes and try to chew and swallow these fruits in the back yard, which may cause suffocation in young children (Figure 134)[35]. Thus, the choking hazard should be taken into account.

Figure 134: Grape in the play area, a choking hazard

Figure 135: A tree in the play area

The orange tree looks fine, because it has big fruits, which do not usually fall down until maturity. Moreover, the KG has cut all sharp thorns on branches which are reachable by children, leaving the orange tree with smooth branches (Figure 135). In addition, there are climbing plants in this area, which provide shade to the outdoor area but also obstruct vision and natural light entering the main classroom.

[35] The Center for Disease Control and Prevention (CDC) reports that in 2001, 17,537 children 14 years and younger were treated in U.S. emergency departments for choking episodes. Nearly 60% of these cases were caused by food while more than 80% of these involved preschool children. In addition, according to the Department of Health in the New York State, choking is the fourth leading cause of accidental death in children under the age of 5.

### 6.4.4. The general internal view of (EL) KG

Figure 136: The main classroom, class number 1

**Analysing the interior spaces of (EL) KG**

The interior area has been refurbished recently (Figure 136). Some works were required, such as: plastering walls and ceiling, painting works, some carpentry work such as fixing doors and installing new cupboards and shelves, polishing floor tiles, installing a fire extinguisher and a first-aid kit, and buying new furniture and educational toys (Figure 139). According to the KG director, the fresh look has had a great impact on children as well as staff. The KG has become more colourful, beautiful, and interesting. And, most importantly, it has become more playful and fun for all children.

Figure 137: The main class

### a) Daylight

The first impression about the quality of light in this KG was not positive. On the first visit, which was on a sunny day, it was almost impossible to see or recognise anyone or even anything inside the main classroom after a few seconds of passing the main door, because of the high contrast of light between outside and inside (Figure 137).

**Figure 138: The traditional ceiling**

In addition, the low amount of daylight which could access the room seems not enough for visual tasks or daily activities even when using some artificial light (Figure 138). Therefore, the eyes of newcomers have to wait for a few minutes before adapting to the new environment. It seems that the supporting lighting system (Figure 138) was not enough to address this issue, because lighting equipment did not cover the room's needs in terms of the amount, capacity and distribution; this space is required to reach the minimum standards (more research will be done in this study to examine this specific problem, Pages 285-291).

### b) Qaws Elferash 'storage books'

The designer took advantage of 'Qaws Elferash', which is a storage space in the thick interior walls of PS traditional houses, for storing educational toys, stories and some educational tools (Figure 136 and 139). Moreover, they retained the main features of the PS traditional buildings such as 'Aqid' domes, and openings such as doors and metal windows (Figure 142 and 143). However, this KG is still suffering from some problems. For instance, high humidity has left its negative impact on the previous maintenance works. The paint has been affected badly as a result

**Figure 139: '*Qaws Elferash*' for storing toys and books. Universal tiles have been fitted above the traditional stone tiles, class No.2**

of the emission of moisture from the thick walls that were built from earth and lime (Figure 172) (more research will be done in this study to examine this specific problem). (For more information about 'Qaws Elferash', please see the PS traditional buildings: Flexibility, Page 64)

### c) KG flooring

KG floors were covered by natural stones, such as in classroom number 3 (Figure 140), or by a traditional old mixture of lime and earth, which has been covered later by installing universal tiles above them (Figure 136). Although these kinds of floor materials are easy to clean and keep the KG cooler during the summer, they are too cold in the winter and have a hard surface, which is harsh if children's bodies and heads hit the surface.

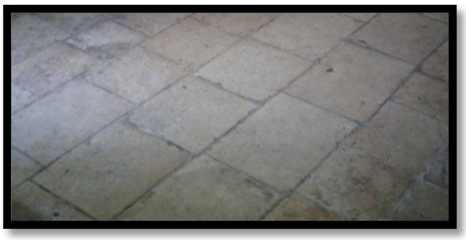

**Figure 140: Natural stone floors in classroom No. 3**

### d) The relationship between inside/outside and children's feelings

The children in these classes cannot keep contact with the outside environment for three reasons. First, children do not have eye contact because the KG has been surrounded by high concrete walls (Figure 123). The second reason is that the KG itself is surrounded by attached houses on two sides, whereas a high wall is located on the third (Figure 132). Finally, the most important point, which made the children feel as if they are in a prison far away from their homes, is that the majority of class windows have been installed in high positions, which deprives the child of communicating with the surroundings (Figure 141 and 143).

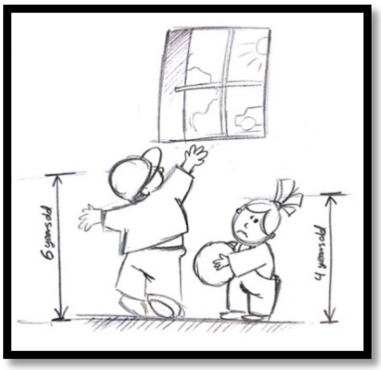

**Figure 141: The view in class No. 2**

Figure 142: The view in class No. 2. Even where the only wide window has been installed there is a high wall blocking the view. Note: this window was installed at 120cm height (Figures 32 and 34).

Figure 143: High windows, Classroom No. 3

e) Water outlets

In this KG there are plenty of installed water outlets (1 for each 8.57 children), which are easily accessible from KG rooms or from the outdoor play area (Figure 128). However, at the moment, there are only three usable water outlets; all other outlets are broken or closed, making them out of service (Figure 144). This reduces the ratio to 20 children per useable outlet; this rate does not include the KG staff, who are using the same outlet. It is not clear if this was the KG way of reducing water wastage or water consumption, thus reducing the water bills overall.

It may be, as the KG director claims, because of young children who used to destroy these outlets with their teeth; thus the KG had to spend a lot of money on replacing and installing the damaged taps before they stop doing so. Or it may be both,, as the KG used this issue as an excuse to start saving money on bills. Regardless of the causes, it is believed that this issue is still the KG's duty and it its responsibility to find and

Figure 144: Damaged water outlets

install appropriate methods that guarantee enough 'durable' water outlets that are suitable for children's use, and it is the KG's responsibility to provide all children and their staff with drinking water.

### f) WC kits scale and cleaning chemical store

There was a lavatory for every 23 children in 2011/2012 and around one for every 34 children in 2010/2011. Although this KG has been redesigned recently, some problems still exist. For instance, the lavatory kits do not meet the child's scale. The basin is still huge and installed in such a high position that it does not allow children to use it easily (Figure 145). In addition, classroom number 3 has a very high threshold, which is considered high even for staff (Figure 146) and the number of WCs was not fit for PS regulations or UK regulations (Appendix 5).

A sharp saw, kerosene bottle and some cleaning products (chemical base) are stored inside the children's lavatories (Figure 147). In the KG lavatories block there is a shelf for storing some strong cleaning chemicals such as Clorox bleach (chlorite), which is a compound of sodium hypochlorite. This kind of cleaning product is very strong and could be very dangerous if someone breathed it directly, especially in closed areas such as a KG lavatory cabinet. Moreover, some people are sensitive to detergents and cleaning products.

It should be pointed out that, although these cleaning chemicals were stored in high positions that would not be easily reached by children, children's curiosity may lead a child to throw

**Figure 145: Sinks at inappropriate level for child's use**

**Figure 146: High threshold, class 3**

**Figure 147: Cleaning chemicals, insecticide and sharp tools (saw) are stored on a shelf the children's WC**

something on it or move it with a branch that could be taken from the KG back yard. This can put them in a dangerous situation for their safety and health and also reflects the poor safety procedures at PS KGs. It is believed that new terms and conditions of licensing KG facilities should prevent these practices, by forcing KGs to store such materials in safe places far away from children's eyes.

### 6.4.5. The quality of space

#### 6.4.5.1. Environmental quality

**A) Light and lighting**

First: Natural light

According to Richard Wurtman (Wurtman, 1982): "… light is the most important environmental input, after food, in controlling body function". Sunlight plays a vital role in KGs. Designers should depend on natural light in their schemes as much as possible, keeping in mind that light changes with the time of the day, the seasons, and their impact of light on the place. The most effective way to ensure that pupils have the maximum share of natural light is by providing KG facilities with outdoor play areas that are accessible and useable for the majority of the year (Olds A. , 2000). However, it should be pointed out that sharp contrast of light and shade should be avoided inside the building. It should be noted that everything that seems too dark or too bright can scare children or make them feel uncomfortable.

Second: Interior light

Although designers should really deal with natural light as the main resource for KGs, they cannot ignore electrical 'lighting support systems'. They should combine both types in a way that looks as if they are an integrated part of the architecture.

There is no doubt that a successful lighting design is one that focuses on the type of activities which are going to occur. Designers should be careful with the type of lighting used and the amount of light in each space, both of which enable the users of the space to focus on their tasks without visual difficulties and in a comfortable environment (Olds A. , 2000).

Therefore, a variety of lighting installations is required. There are many kinds of lighting equipment that are suitable for each kind of task and activity such as lighting for reading, playing sport, and in an emergency. Lighting and its effect on surface colours can create pleasant and interesting places for the users (Orlowski, et al., 1997, p. 9).

By depending on natural light during daylight hours, the use of electrical lights should be limited and it should be considered as a support system of daylight when necessary. This happens when the light level is less than 150 lux in common areas and if the light level is less than 300 lux in specific task areas inside KGs, such as reading corners. Moreover, a maintained luminance at floor level in the 100 lux range is required for stairs and corridors, whereas it should be at least 200 lux in entrance halls and waiting rooms (Table 19) (Bruin-Hordijk & Groot, 2010).

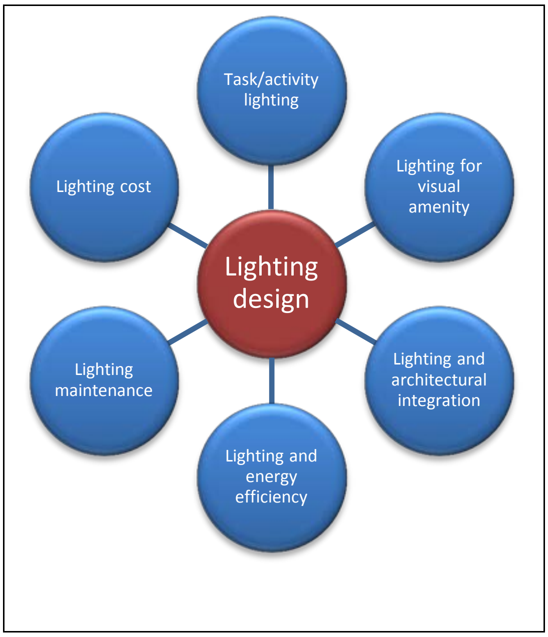


**Figure 148: Design framework (Orlowski, et al., 1997, p. 8)**

It is important to use an electronic lighting system efficiently. In order to achieve this, automatic switches and lighting control through lighting sensors and movement can be a useful way to save energy.

| Lighting Levels | | | |
|---|---|---|---|
| Place | Activity | Area | Minimum (lux) |
| Schools | Casual seeing | Corridors, toilets and stores (general lighting) | 100 |
| | | Stairs | 150 |
| | Continuously occupied | Entrance halls and dining rooms (school canteens) | 200 |
| | Visual tasks moderately easy | Classrooms, tutorial rooms and computer practice rooms (reading/writing lighting) | 300 |
| | Visual tasks moderately difficult | Kitchen, art room | 500 |
| | Visual tasks difficult | Technical drawing room | 750 |

**Table 19: Examples about the types of tasks that occur in schools/places and the minimum amount of light required (CIBSE, 2002) (CIBSE, 2003) (Bruin-Hordijk & Groot, 2010)**

However, on average, the chosen luminaries should give an average initial circuit light efficacy of 65 lumen/circuit watt for the fixed lighting devices inside the KG buildings (Orlowski, et al., 1997, p. 9). Designers should keep in mind that electronic light equipment also needs maintenance after some time of use. Hence, devices should be installed in places where staff can replace and fix them easily. Capital cost and running cost should be considered to guarantee efficiency. Moreover, it is important to ensure that both costs meet the budget (Figure 148).

Nevertheless, it should be noticed that direct sunlight could be a discomfort if children's seats are located in direct sunlight, which could be harmful to children's eyes (Winchip, 2011).

This problem is usually easily solved by intelligent design, which could minimise the glare factor, too. It could be achieved in various ways such as using external blinds that can reduce the solar heat gain. However, interior blinds could also be considered a source of noise when windows are opened. Furthermore, interior blinds are usually difficult to fix and they could have a short lifetime if abused by children.

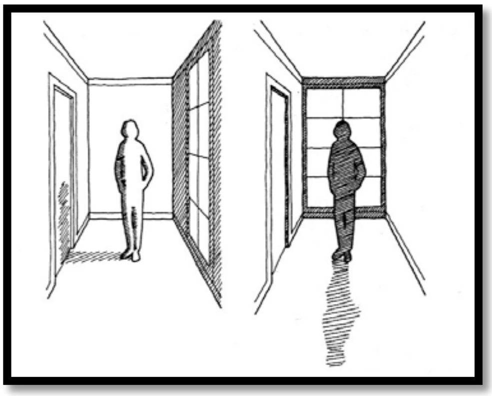

**Figure 149: Light and shadow direction (Wood, 1999)**

Moreover, designers should be careful about the silhouetting issue, which should be avoided in circulation and meeting areas. In order to achieve this, lighting from the side could give good modelling and definition to subjects (Figure 149).

**B) Acoustics**

Designers should be concerned about outside noise pollution and inside echo sounds, which may have a negative effect on children's ability to hear clearly without interruption. Moreover, designers should work on dividing the KG spaces into quiet and noisy areas which are related to room types. Secondly, they should use insulated materials in walls as well as floors to reduce noise and the echo sound factor (Orlowski, et al., 1997, p. 1), whereas outside, planting trees may be a useful method to decrease the traffic noise level and any neighbouring activities. External noises in the backyard of KGs should be kept under 60 decibels (dB), which can allow children's speech to be heard from a short distance.

Classrooms with low acoustic absorption and long reverberation times can not only create an uncomfortable atmosphere, but also lead to hearing problems for all room users by letting them suffer from a high ambient noise level when many children speak at the same time. This may lead to people raising their voices to be heard, which will compound the problem (Orlowski, et al., 1997, pp. 2-5). Thus, noise control is one of the main KG demands, which could be achieved in the classroom in various ways. It may be achieved by using double-glazed windows, carpets or foam floors, curtains, or insulated ceilings. These methods could keep the noise level under 40 dB inside KGs.

Music rooms may be excluded from this range of frequency because the kind of activity in these rooms requires an increase in the bass frequencies up to 50% (Table 20).

| Type of room<br><br>(Primary schools) | Approximate size | | Recommended unoccupied mid-frequency Reverberation Time (Seconds) |
|---|---|---|---|
| | Area ($m^2$) | Height (m) | |
| Classroom or class-base | 30 – 65 | 2.4 - 3.0 | 0.5 – 0.8 |
| Library | 12 – 70 | 2.4 – 3.0 | 0.5 – 0.8 |
| Music & drama studio/AV room | 30 – 80 | 2.4 – 4.0 | 0.8 – 1.2 |
| Hall (assembly/PE/movement) | 80 – 200 | 3.7 – 6.0 | 0.8 – 1.2 |
| Dining rooms | 80 – 200 | 2.4 – 3.2 | 0.5 – 0.8 |
| Hall (music/drama/PE/AVA/assembly) | 80 – 200 | 3.7 – 6.0 | 0.8 – 1.4 |
| Swimming pool | 65 – 120 | 3.7 – 6.0 | <2.0 |
| Kitchens | 65 – 120 | 2.7 – 4.0 | 1.5 |

**Table 20: Recommended reverberation times for unoccupied spaces (Orlowski, et al., 1997, p. 5) (CIBSE, 1994)**

However, this factor will be ignored in this study for the following reasons. First, because of the small size of PS KG classrooms, children’s bodies themselves are enough to absorb sounds. Moreover, children in PS KGs do not sleep during the KG hours (KGh) as they are limited usually to between 5 and 5½ hours. According to the principal of the KG section at MOHE, the majority of KGs close their doors by 12:30pm and the last KG in Nablus Province closes and is vacated by 2:00pm.

**C) Classroom climate: Indoor temperature**

According to Julie Crotty (2002) classroom climate is defined as the type of environment that is created for students by the KG staff. Teachers are interested in creating a comfortable classroom climate for their pupils for a positive learning environment. Crotty believes that having an environment where children feel safe, encouraged, and intellectually motivated will lead pupils to achieve their potential.

Based on a WHO report (WHO, 1987), a positive classroom climate allows children to reach their basic physical and mental health needs. On the other hand, a negative classroom climate can be considered an environment where students feel uncomfortable, whether physically, emotionally, or academically.

It is believed that the physical needs of children such as food, clothing, shelter, and safety must be met before children can be expected to start learning. Therefore, classroom climate is especially important to pupils as well as teachers. Before the year starts, the physical environment of the classroom must be tested. The learning environment should welcome all new arrivals to discover the new environment that will soon be considered their second home. Their comfort is the key to interacting with their teachers as well as with their new colleagues, which is important to encourage them to participate in new activities within the classroom environment.

- **Heating and thermal performance**

Designers are still thinking about the best methods to control temperature and climate. This can be realised by gathering near to central heating, retreating behind thick walls or covering their bodies with heavy clothes in the winter, or by building fountains, shading and domes or using cool colours in the summer seasons. The ultimate quality is considered to have been achieved when people feel pleasant and comfortable. In winter seasons, each room used for indoor activities in KGs should be heated during work hours until it reaches the appropriate temperature for each area. Designers should keep in mind the kind of activity that rooms contain and the type of clothing likely to be worn, in order to create a comfortable environment (Table 21).

| **Area** | **The minimum temperature**[36] |
|---|---|
| Area where there is the normal level of physical activity associated with teaching, private study or examinations | 18°C |
| Area where there is a lower than normal level of physical activity because of sickness or physical disability including sick rooms and isolation rooms, but not other sleeping rooms | 21°C |
| Area where there is a higher than normal level of physical activity such as gym | 18°C (for children only) and 15°C for adults) [37] |
| Non-teaching areas | 16°C |

**Table 21: The minimum air temperature inside the KGs in the winter (NUT, 2011)**

[36] When the external air temperature is -1°C (NUT, 2011)

[37] Based on the WHO report, the comfortable indoor temperature degree is between 18 °C and 24 °C and should not exceed 3°C below the recommendation degree at sitting level (0.6m) and standing level (1.2m) (WHO, 1987)

**D) Ventilation**

First: The concentration of carbon dioxide ($CO_2$)

Carbon dioxide (chemical formula $CO_2$) is a kind of natural gas that can be found mainly in air. The amount of $CO_2$ in a given air sample is commonly expressed as parts per million (ppm). The outdoor air in most locations contains about 380ppm $CO_2$. Higher outdoor $CO_2$ concentrations can be found near vehicle traffic areas, industry and sources of combustion.

According to the American Society of Heating, Refrigerating, and Air-Conditioning Engineers ASHRAE Standard 62 (ASHRAE, 2002), the maximum concentrations of $CO_2$ in KGs and nursery schools should be below 1,000ppm, whereas the recommended amount should be below 800ppm.

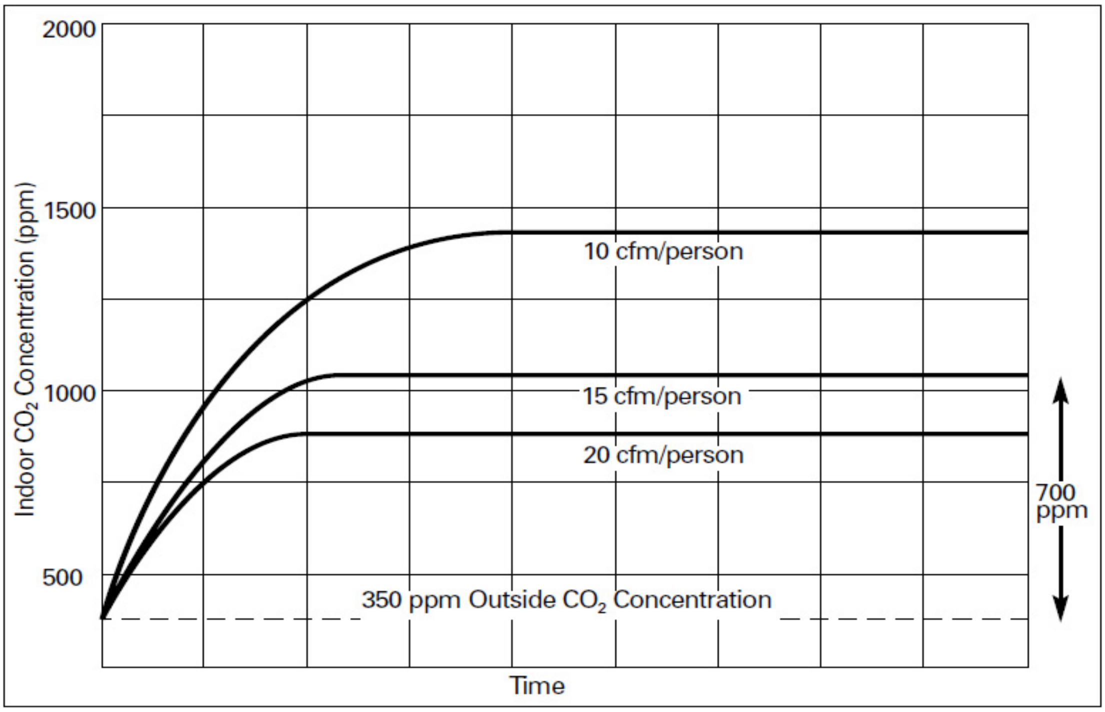


**Figure 150: Equilibrium of $CO_2$ Concentration at Various Ventilation Rates (ASHRAE, 2002)**

The side-effects of high concentration of $CO_2$ start to appear in adult's bodies when it reaches approximately 3,000ppm, but there is no serious direct health threat until 5,000ppm[38], which normally causes dizziness, confusion and dyspnoea. In addition, according to the Canadian Centre for Occupational Health and Safety (CCOHS) report, the maximum level of $CO_2$ for adults is 20,000ppm.

According to Susan A. Rice (Rice, 2003), low-level $CO_2$ exposure (<3,000ppm)[39] can produce relatively benign short-term effects in healthy, young adults. One effect, alterations in bone metabolism and related blood calcium concentrations, however, may have potentially longer-lasting adverse effects in both healthy and sensitive populations (Table 22) (Appendix 6).

| $CO_2$ (PPM) | $CO_2$ Effects |
|---|---|
| 1,000 | Respiratory rate (RR) ↑ 37% |
| 1,600 | V. ↑ ~100% |
| 2,000 | RR ↑ ~50%; brain blood flow ↑ |
| 3,000 | Exercise tolerance ↓ in workers when breathing against inspiratory and expiratory resistance |
| 5,000 | RR↑ ~200%; RR ↑ ~100%, dizziness, HA, confusion and dyspnea |
| 7,200 | RR ↑ ~200%, HA, dizziness, confusion and dyspnea |
| 8,000 – 10,000 | Unbearable dyspnoea, followed by vomiting and disorientation |
| 10,000 | Unbearable dyspnoea, followed by vomiting, disorientation, hypertension and loss of consciousness |

**Table 22: Commonly Cited Effects of $CO_2$ (Rice, 2003)**

Researchers are looking for links between elevated $CO_2$ concentrations and reduced productivity and achievement, whereas doctors have indicated the impacts of $CO_2$ on humans, which are:

1. Headache
2. Exhaustion
3. Shortness of breath
4. Nausea
5. Dizziness

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38 Exposure to fewer than eight hours
39 In the presence of normal oxygen

Second: The concentration of carbon monoxide (CO)

According to Peter Mikulka (Mikulka, O'Donnell, Heinig, & Theodore, 2006), the interior ventilation of buildings and homes is important for the prevention of indoor air pollution, which occurs as a result of rising steam and fumes resulting from the process of cooking inside houses. In addition, using fuels such as timbers or kerosene inside closed homes for cooking or heating leads to an increase in both the level of $CO_2$ and the level of carbon monoxide (CO) in the interior air. CO is a colourless, odourless, and poisonous gas.

### A high level of CO poisoning leads to more dangerous symptoms:

- Mental confusion
- Vomiting
- Loss of muscular coordination
- Loss of consciousness
- Ultimately, death

Breathing this invisible gas not only affects the performance of residents in such a closed place and makes them feel sick, but it may kill them. Therefore, it is called 'The silent killer' because the people it hurts cannot see it, smell it or taste it (EPA, October 1996).

| **PPM CO** | **Time** | **Symptoms** |
|---|---|---|
| 25 | KGh | Maximum exposure in the KG facilities in KGh. |
| 35 | 8h | Maximum exposure allowed by OSHA in the workplace over an 8-hour period. |
| 200 | 2-3h | Mild headache, fatigue, nausea and dizziness. |
| 400 | 1-2h | Serious headache – other symptoms intensify. Life-threatening after 3 hours |
| 800 | 45m | Dizziness, nausea and convulsions. Unconscious within 2 hours. Death within 2–3 hours. |
| 1,600 | 20m | Headache, dizziness and nausea. Death within 1 hour. |
| 3,200 | 5-10m | Headache, dizziness and nausea. Death within 1 hour. |
| 6,400 | 1-2m | Headache, dizziness and nausea. Death within 25-30 minutes. |
| 12,800 | 1-3m | Death |

**Table 23: Symptoms associated with a given concentration of CO over time (OSHA)**

However, this factor will not be examined in the next case study because there are no cooking and frying processes in these KGs. In addition, nowadays, none of them are using fuels such as timbers or kerosene inside their buildings for cooking or heating that would lead to an increase in the level of CO. Moreover, there are no machines inside these facilities that could produce CO gas. All previous factors reduce the importance of measuring this type of gas at the moment in this study.

Third: Relative humidity

Anthony V. Arundel suggests that the relative humidity in indoor environments should be between 40%RH and 60%RH, because a high level of humidity in closed areas leads to mildew growth and fungi problems (Arundel, Sterling, Biggin, & Sterling, 1986) (Baughman & Arens, 1996). A damp building usually shows obvious mildew growth and a mildew smell. Some types of mildew have negative health effects on humans in indoor environments as well as causing damage to buildings. Recently, there have been reports of severe disease as a consequence of indoor mould exposure, mainly due to Stachybotrys chartarum. In addition, there is a direct relationship between fungal pollution and human disease (Kuhn & Ghannoum, 2003) (Hendry & Cole, 1993) (Berglund, et al., 1991).

These reports show that moulds and fungi are causing serious diseases for humans in an indoor environment. Thus, having a well-ventilated building can reduce the humidity and CO in indoor environments, which are the primary catalyst for the following pathogens: infection, allergy and toxicity. Fresh air plays a significant role in the physical and mental performance of humans. Examples of the diseases that can be caused by moulds and fungi are shown in these reports:

1. Asthma (Bush & Prochnau, 2004)
2. Allergic rhinitis (Andersson, Downs, & Mitakakis, 2003)
3. Hypersensitivity pneumonitis (Hogan, Patterson, & Pore, 1996)
4. Allergic fungal sinusitis (Ponikau, et al., 1999)
5. Allergic bronchopulmonary aspergillosis (Riscili & Wood, 2009).

### The symptoms of these conditions are:

1. Difficult breathing
2. Headache
3. Tiredness
4. Lack of concentration.

Ref Orlowski points out that, in an indoor KG environment, it is required to provide three litres of fresh air per second per person as a minimum standard in the winter season,[40] whereas the typical ventilation rate is between four and six litres of fresh air per second per person (Orlowski, et al., 1997, pp. 16, 30). In addition, Anthony V. Arundel believes that the majority of adverse health effects caused by relative humidity would be minimised by maintaining indoor levels between 40% and 60% (Figure 151), which can be addressed by good ventilation (Arundel, Sterling, Biggin, & Sterling, 1986). However, a WHO report shows that the optimum level of indoor relative humidity in the comfort zone of $18^{O}C$ to $20^{O}C$ is between 40%RH and 50%RH (WHO, 1987, p. 4).

[40] Assuming an external temperature of $-1^{o}C$

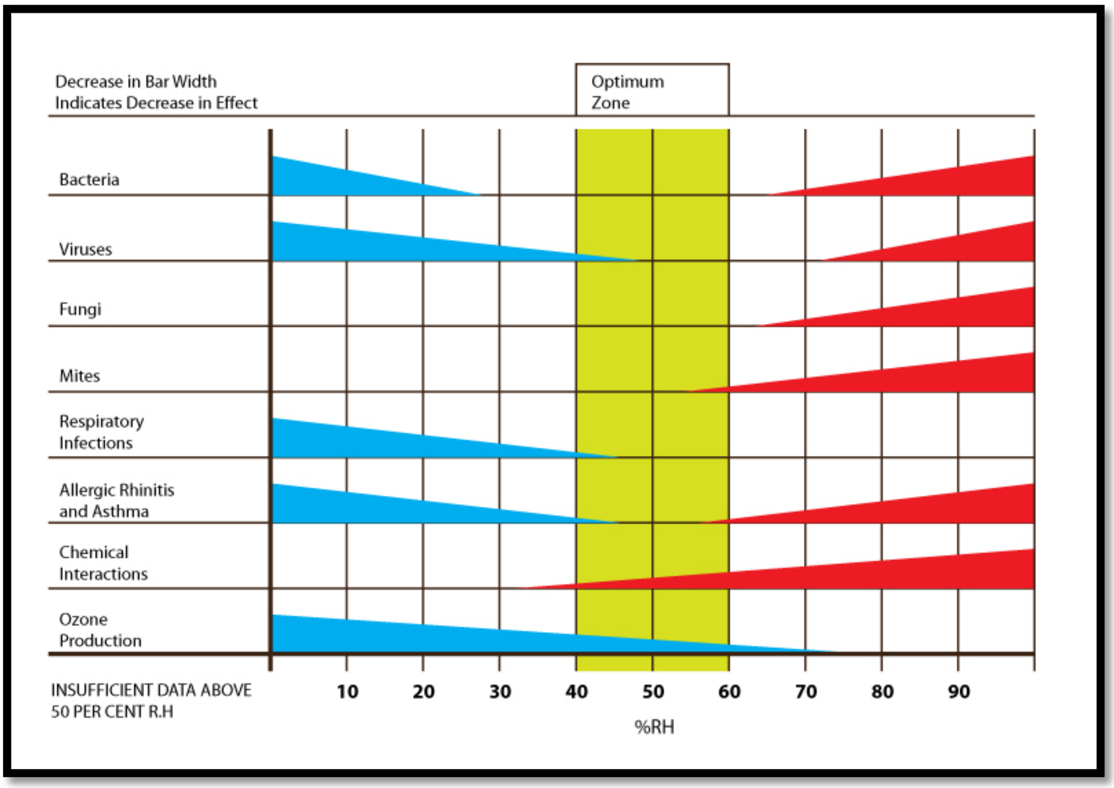


**Figure 151: Optimum relative humidity range for minimising adverse health effects (Arundel, Sterling, Biggin, & Sterling, 1986, p. 358).**

**E) The relation between inside and outside**

First: Relation to nature

KGs should be designed and built in harmony with nature. Nature means: earth, air, sky (light) and water. This concept has been supported by many cultures such as the Chinese science of “Feng Shui”[41] and the Romans, who centred architectural design around nature. Thus, it is not a modern concept, although it may have a new view (Rossbach & Yun, 1998) (Collins, 1998).

In brief, the land of the KG and the KG building itself should be compatible with the environment. The KG should not be in conflict with it, but should reflect it. Therefore, KGs should be very well integrated with both nature and the site. This may happen by using the location through reference to history and culture or environmental items such as materials and shapes. Yet each KG building should have a unique particular identity.

KGs could be linked to the surrounding environment by using its elements. Thus, using natural materials is strongly recommended. Children learn from the environment and they also use it to improve their skills and senses. They have a different view of the environment than adults. The relationship between children and places is stronger than for adults; young children remember places better than they remember people (Olds A. R., 2000, p. 21). They are deeply affected by details that adults are often unaware of. Therefore, the quality of these spaces is not only important as a safety issue but also for improving children’s senses.

Second: View

A strong relationship should be created between the inside and the outside of the KG buildings. This may occur by destroying the feeling of separation between both of them, and also by expanding the children’s view to beyond the walls of the playrooms and KG buildings. One way to create this situation is by increasing transparency. This could be achieved by

[41] Feng Shui: literally translates as wind-water (Collins, 1998). The Chinese art of determining the most propitious design and placement of a grave, building, room, etc., so that the maximum harmony is achieved between the flow of chi of the environment and that of the user, believed to bring good fortune (Collins, 2005).

manipulating windows, doors and walls. Furthermore, KGs should create links between both sides, such as decks, balconies, deep roof arcades and porches (Figure 152).

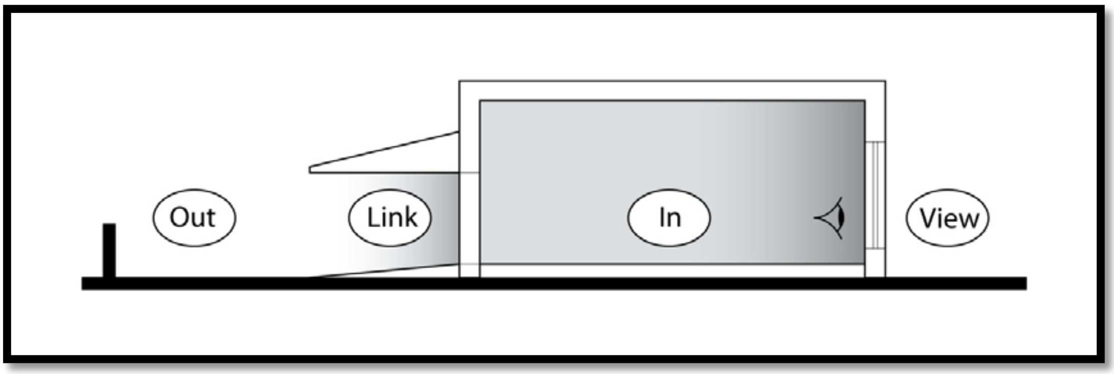


**Figure 152: The relationship between inside and outside.**

Briefly, the KG must rely on natural light as much as possible – instead of artificial light – to meet minimum lighting standards, which are 150lux for general tasks and 300lux for visual tasks. Although the amount of light reaching the desired areas is the main factor in measuring the quality of light, there are other factors that can play a vital role in this issue as well, such as glare light, the colour of the light, and its effect on the surface (reflection).

The second factor that determines the quality of space is acoustic quality. Classrooms should have high acoustic absorption and short reverberation times to create a comfortable atmosphere. Thus, KGs should apply all possible methods to keep the noise level under 40dB inside their facilities. In addition, the recommended unoccupied mid-frequency reverberation time should not exceed 0.5-0.8 seconds.

Regarding the indoor temperature in KG facilities, the responsibility of the KG is to maintain the classroom temperature between +18$^{O}$C and +23$^{O}$C, when the outdoor temperature is -1$^{O}$C.

For achieving good ventilation inside the KG buildings there are three variables: the concentration of carbon; the relative humidity in the air; and the internal temperature. The concentration of $CO_2$ should not exceed the maximum limits (1,000ppm) and should be kept below the recommended level (800ppm). In addition, the maximum exposure in the KG facilities is 25ppm/KGh. Furthermore, the relative humidity should be between 40% and 60% inside classrooms. It should be pointed out that this study will focus on four factors only, which are: the amount of light, the concentration of $CO_2$, the level of the indoor temperature, and the humidity. The reason for ignoring the other factors will be clarified later in this study.

The limits of all previous factors that play a vital role in determining the quality of space should be monitored to ensure achieving a safe, healthy and comfortable learning environment inside KGs. Therefore, all these figures will be used as minimum standards for future measurements. These standards can determine and demonstrate whether or not a PS KG reaches the desired quality via the current building regulations.

#### 6.4.5.2. Introduction about future case studies

In 2011, this study was been granted all necessary permits and official approvals from the head office of MOHE in PS and from the MOHE office in the study area (Nablus Province) to access KG facilities and to install the below meters (Table 24), which are essential for the next field study. In addition, informed consents have been freely given by the participants (KG landlords/KG directors)[42].

In addition, the field study has been designed to meet the University's Code of Practice on Research Ethics. The names of participants (KGs) in the field research will be changed in order to keep their identity unknown, which is based on the wishes of the participants and the goal of achieving the requirements of research ethics. Moreover, the accurate maps showing the particular location of the participants will be removed later for the same reason.

[42] Original documents are available upon request

| Measuring | Model | Accuracy |
|---|---|---|
| Lighting | The CEM DT-8820 is a 4-in-1 digital Multifunction Environment Meter | ±5%lux |
| Temperature and humidity | Tinytag Ultra 2, TGU-4500, Data Logger | ±3%RH<br>0.3-0.9$^{O}$C |
| Carbon dioxide, temperature and humidity | Extech Sd800 Measurement Data Logger | ±40ppm<br>0.8$^{O}$C<br>±4%RH |

**Table 24: The meters that have been used in the field study 2011/2012**

This study will focus on the quality of space by studying and analysing the lighting amount and distribution, the concentration of $CO_2$ in air, the humidity rate, the indoor temperature, and the relationship between inside/outside in KG facilities. The aim of studying the quality of space in the PS KGs is to show whether or not the current PS licensing regulations can guarantee the minimum quality of learning environment inside their early educational buildings, which is the main aim of the establishment of these regulations. Poor quality space has a direct negative impact on children's health and safety. In addition, it is considered one of the main hindrances of achieving the educational aims of KGs.

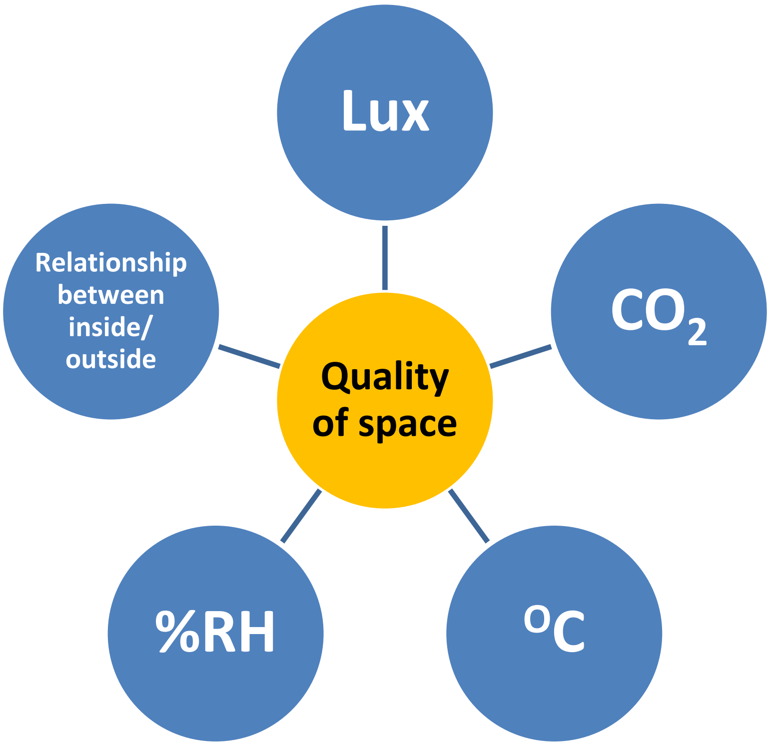


**Figure 153: Factors affecting the quality of space**

### 6.4.6. Methodology of data collection

**a) Methodology of measuring the amount of light**

In this experiment the interior spaces of classrooms (floorings) have been divided into a grid to outline the measurement points (Figure 154). Then the measurement has been taken four times, twice on a sunny day and twice on a clear night. Each one of them was on a children's table elevation (approximately 40 cm) and on their eye elevation, too (approximately 100 cm) (Figure 155).

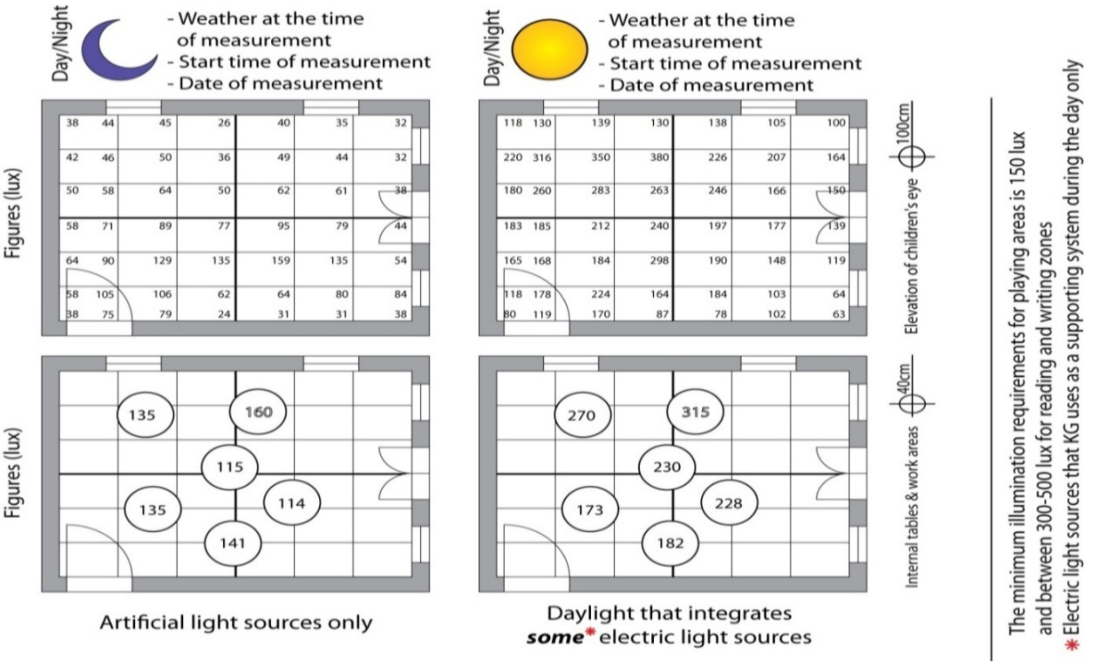


**Figure 154: Example of the grid that is used in divided the KG surfaces related to light amount during day and night**

The aim of measuring lux from the children's table elevation is to identify the quality of light on specific spots that are related to the work areas for children's activities such as painting, reading and writing (visual tasks), whereas the aim of taking a measurement at their eye level is to identify the quality of light (daylight, artificial light or both) that is related to normal children's activity, general tasks such as daily eye contact with their colleagues (Figure 154).

In addition, because some KGs depended on a supporting lighting system during daylight hours, especially in the winter season or on cloudy days, to fill any gaps that may occur in this period, the experiment will work on measuring the maximum amount of light that the KG received in such situations. Therefore, the natural light that enters these spaces will be measured with some integrated artificial light, on which the KG depended on normal days.

The KGs were asked to do what they normally do for daily activities without changing their schedule, habits or routine. For instance, they should not change their response on cloudy days in turning on 30% of the lighting support system instead of 100% or 50%, which they did in such cases to save energy and reduce electric bills. In addition, they should keep windows or curtains closed if they did that in KGh (kindergarten hours), even on cloudy days.

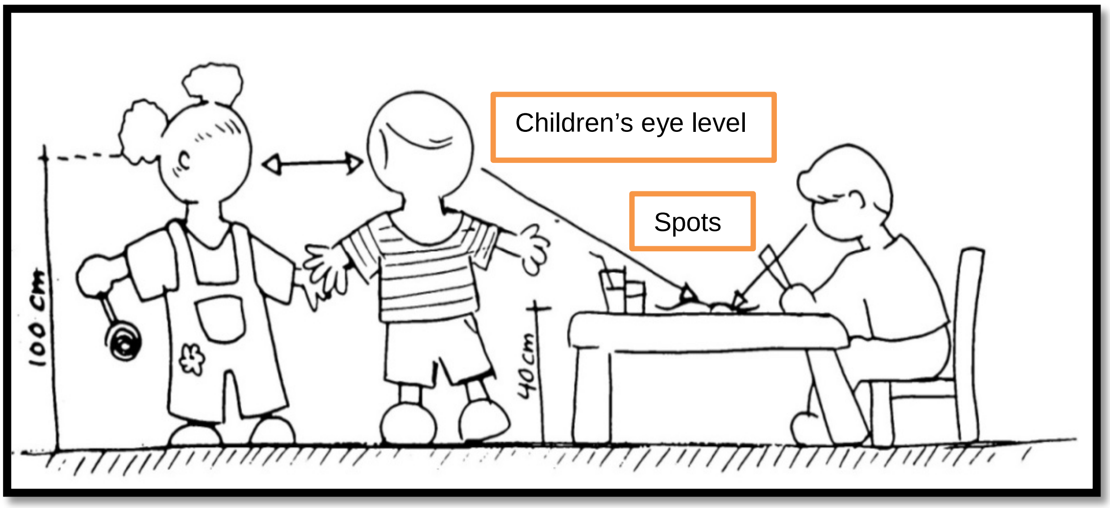


**Figure 155: Children's eye elevation (minimum 150 lux), spots and activities areas (minimum 300 lux)**

The minimum lighting strands for nursery schools, where children are mainly supposed to play and have fun and are not required to learn reading, writing and maths, is between 100 and 200 lux. However, in PS it is believed that all KGs in the study area require these kinds of learning activities at this stage, although the current MOHE regulations of licensing KG facilities forbid this attitude. This makes the PS KGs very similar to elementary schools. This study will not discuss the causes of this phenomenon and its results on teaching progress and children's development, but must point out its impact on the current needs of KG facilities and children, which have changed and shifted to become similar to the needs of the elementary stage. Therefore, at this moment, it is believed that the PS KGs should be dealt with as elementary schools with regard to lighting requirements and the standards that should be followed in such educational facilities. In other words, it is believed that 100–200 lux, which is required for nursery schools, or 150–250 for KGs, is not suitable in the PS case. Thus, it is recommended to follow the minimum lighting requirements of elementary schools, which are between 300 and 500 lux (United Kingdom Parliament, 1999, p. 7); these are more suitable for the reading, writing, accounting and drawing activities that are practised daily within PS KG programmes (Table 19). The study suggests that 150–200 lux is enough for general 'social task' activities, whereas 300–500 lux is recommended in practical areas with specific activities such as reading and writing (visual tasks).

At least two people worked together on the measurement process; one for taking the measurement on the required level/surface, and another to record the outputs and for note making at the same time. The aim of using at least two people was to reduce the time required for this operation.

Time plays a significant role in this operation, especially during daylight hours, because of the changing solar angle. The position of the sun changes during the day, which leads to a change in the amount of light that may enter the building, such as through windows or skylights (Figure 156). In addition, this change has an impact on the distribution of lighting inside these rooms. Therefore, the measurement processes were done as fast as possible to reduce the impact of this factor.[43]

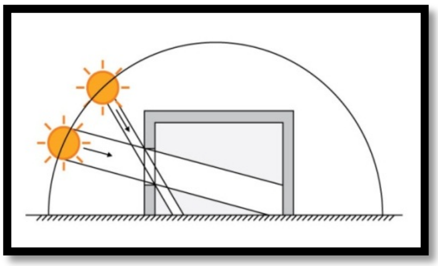

**Figure 156: The impact of time of measurement on the amount and distribution of daylight in rooms**

The measurement was taken at 12:00 noon and completed before 1:40pm. This period was considered to have the highest amount of light during the day. The measurement was done

[43] The measurement process takes between 12 and 16 minutes for each room, with an average size of 20–24m$^2$

while the places were vacated, such as during breakfast hours, outdoor play hours or after KGh.

It should be pointed out that the meter used in measuring the light was a 4-in-1 digital Multifunction Environment Meter, which has a measurement accuracy of ±5%lux (Table 24).

**b) Methodology of measuring the outdoor temperature and humidity**

The data logger has been installed in a Stevenson Screen 'instrument shelter' to measure the outdoor temperature and humidity. The main aim of using a Stevenson Screen is to protect the meter against direct heat radiation from outside sources, while still allowing air to circulate freely around it. The size of the protection screen measures 76cm H X 61cm W X 59cm D (Figure 157). Moreover, the box has been placed 125cm off the ground on four legs, which will prevent ambient ground temperature from affecting the reading. The device has been installed in a place within the outdoor play area, where it does not get direct sunlight but is not in complete shade, since both of those locations can cause inaccurate temperature readouts. In addition, the data logger has been kept away from things like concrete, metal claddings and outdoor vents.

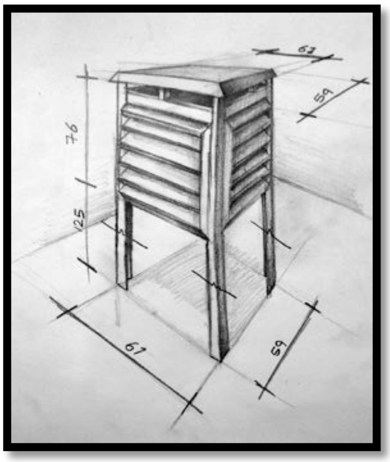


**Figure 157: Stevenson Screen, (dimensions in cm)**

Furthermore, it has been installed away from children's hands and eyes. The outcomes have been taken by Celsius degree ($^{O}$C) and Relative Humidity (%RH). It should be pointed out that the device was installed for 12 hours before the start of KG, and it has been left 6 hours after the end of KGh, to be collected at the end of the experiment days. The weather has been monitored to record climatic changes during the study period, whether it was sunny, cloudy, partly cloudy, clear or rainy. This will be vital later to explain rapid changes in temperature or humidity level.

**c) Methodology of measuring the indoor temperature and humidity levels**

The meters in this experiment have been installed on the inner walls of classroom 'teaching areas' and at children's elevation (50cm above floor level), because the Education (School Premises) Regulations 1999 point out that the minimum standards for temperatures should be measured at this level (United Kingdom Parliament, 1999). Therefore, the meters in this experiment have been installed on the inner walls of classroom 'teaching areas' and at children's elevation (50cm). However, the devices have been hidden by coloured papers to avoid being touched by children (Figure 158). The data loggers have been installed away from things like heating systems, direct sun, vents, water outlets and sinks. The meters were fitted 12 hours before the start of KGh and were left until the end of the experiment. Moreover, by the end of the experiment, the devices had been left for at least 6 hours after the end of KGh and after vacation of the whole building before the meters were collected.

The outcomes have been taken by Celsius degree ($^{O}C$) and Relative Humidity (%RH). It should be pointed out that the meters, which have been used in this experiment to measure the temperature and humidity levels, were Tinytag Ultra 2 (TGU-4500) (Table 24). This kind of data logger has a measurement accuracy of 0.3-0.9°C and ±3%RH. The KGs were asked to do what they normally do for daily activities without changing the way that they respond to variables, especially for weather changes. For instance:

- they should not change their methods in warming rooms
- they should not change their ways and habits for turning off their heating systems in all conditions
- they should not change their habits in closing the classrooms' doors or windows while giving the lesson, but keep to the same routine

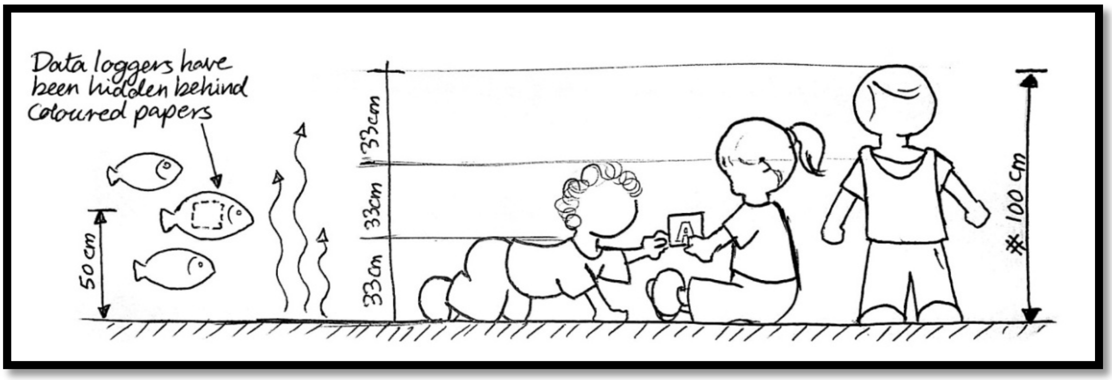


**Figure 158: To ensure that children are warmed at their level, approximately 33cm – 100cm above the floor**

#### d) Methodology of measuring $CO_2$ concentration

The $CO_2$ concentration in the main classrooms could be measured by an EXTECH Sd800, which is a data logger with an accuracy of ±40ppm. The meters in this experiment have been installed on the inner walls of classrooms and at children's elevation (50cm). The meters were programmed to collect data every 60 seconds and then they were fitted in the targeted facility (12 hours before the start of the KG day). At the end of the experiment, which lasted approximately 90 hours for each KG, all devices were been collected again (after approximately 6 hours of the end of KGh). All KGs have been required to keep to their schedule, daily activities, routine and especially their habits in response to changing weather.

#### e) Methodology of recording daily activity (pupils' life-cycle at KG)

Each KG already has a specific schedule to follow for the whole week. These schedules determine the kind of activities that teachers should focus on and the time that should be taken. Moreover, all KGs in this case study have attendance records for their children. These records have been collected from KGs with the consent of MOHE.

### 6.4.7. Methodology of studying data

**a) Lighting**

The amount of light will be linked to the minimum lighting requirements in KG facilities and its distribution within the internal spaces' 'teaching areas'. Then, the amount of lighting will be linked to the kind of activities that occur in these spaces: 'visual tasks or general tasks'.

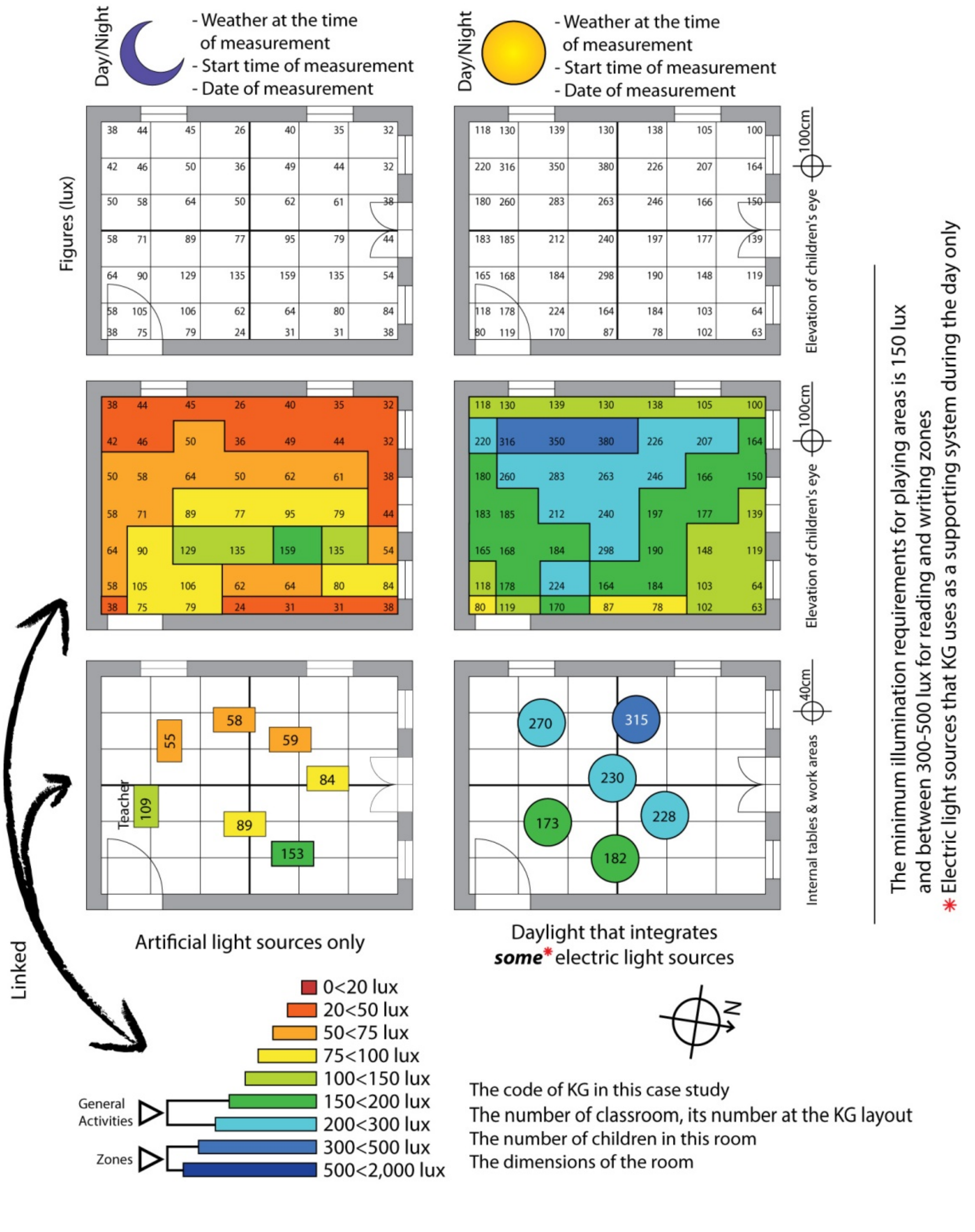


**Figure 159: Example about linking the current amount of lighting during day and night to the minimum of lighting requirements in KG classrooms**

The aim of linking the amount of lighting to the minimum lighting requirements is to enable the study to highlight the amount of shortfall or over-lighting, whereas the distribution of lighting will outline the places/zones that need to be addressed, and their sizes.

In addition, the amount of lighting and its distribution will be linked to the kind of activity and the time that is taken in achieving these tasks, whether they were visual tasks or general tasks.

The ratio of the time of daily visual tasks to the size of well-lit places for such tasks will outline this gap and its amount. Moreover, it will highlight the place and the appropriate amount of light that each room needs to meet the minimum requirements.

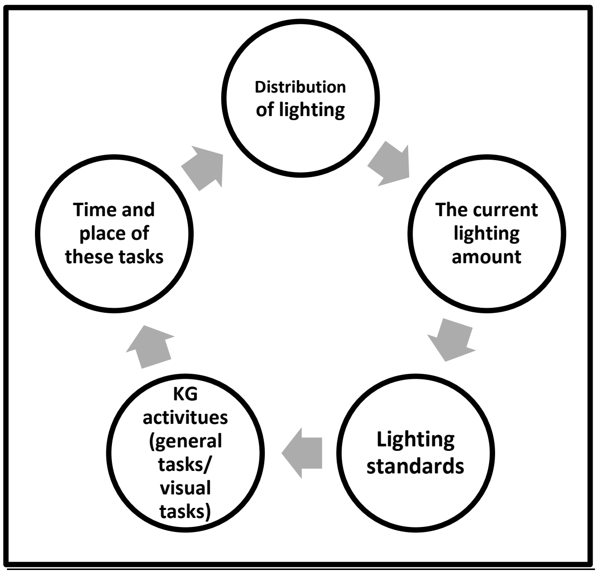


**Figure 160: The ratio of the time of daily visual tasks to the size of well-lit places**

It should be pointed out that linking all the previous outposts (Figure 160) will lead to knowledge about whether the current PS regulations in licensing KG facilities are able to reach the minimum quality of learning spaces that have been established or not.

The relationship between the KG daily tasks and the time taken within KGh will be shown by pie charts (Figure 161). These pie charts will show the percentage of time spent in each classroom for KGh. Furthermore, the intermediate visual tasks and general tasks will be shown for all KG classrooms.

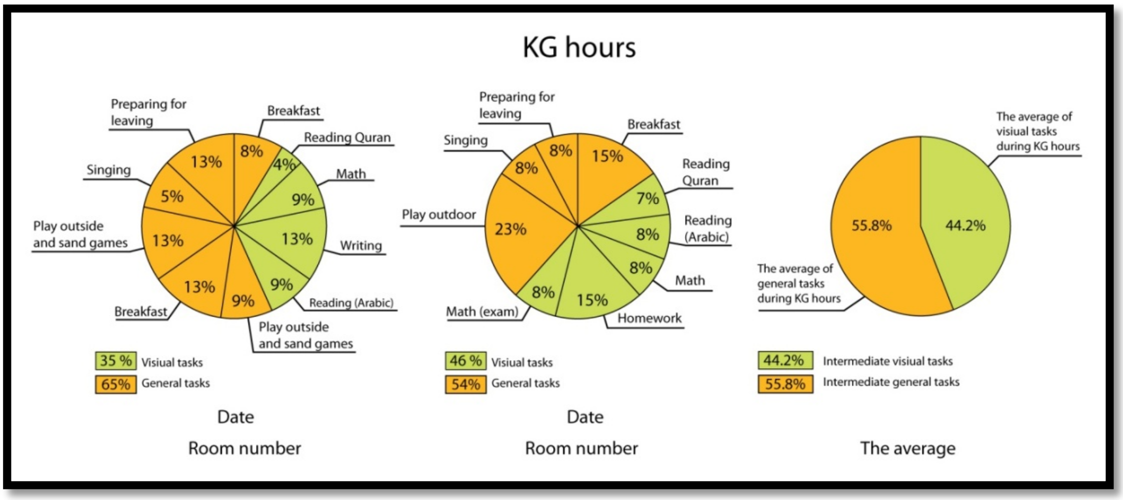


Figure 161: Example of the ratio of visual tasks to general tasks in KG activities

**b) Outdoor temperature**

The outdoor temperature will be linked to the indoor temperature, humidity and $CO_2$ level. By linking the outdoor temperature to the indoor temperature, this may show the quality of heating systems that KGs use to warm their classrooms. In addition, this will show the quality of insulation materials and the effectiveness of traditional structures in keeping these classrooms warm when the temperature drops. This will occur by measuring the difference between both temperatures during a specific period; wherever the temperature difference between internal and external was large, this indicates something about the quality of building insulation, the effectiveness of the heating system in this place, or both.

Linking the outdoor temperature and weather (clear or rainy) may point to the quality of ventilation system or methods that are used in these educational facilities. In addition, this will show the effect of KG design/pattern/materials on these important factors, which are humidity levels and the concentration of $CO_2$ in indoor air. It is believed that the outdoor temperature has a direct and indirect impact on the majority of variables in this study.

**c) Indoor temperature**

The first step will be to link the indoor temperature to the legal temperature requirements within the KG facilities. This will occur by outlining the minimum (+18$^{O}$C)[44] and maximum acceptable degree of internal spaces (approx. +24 $^{O}$C)[45], which are related to KG activities that occur in these spaces (NUT, 2011) (WHO & UNEP, 1985).

The study will use charts to show these limits and to show when, where, and for how long these limits have been exceeded. Then, the whole situation, which includes possible problems, difficulties, their causes and impacts, will be clarified by linking the previous information from the charts with pupils’ life-cycles, KGh, the outdoor temperature, KG practices, building structure, building materials, pattern and heating system or methods.

**d) Indoor humidity**

The indoor humidity will be linked to humidity standards. Therefore, charts will show the minimum (40%RH) and maximum (60%RH) acceptable and comfortable levels of humidity for these facilities (Arundel, Sterling, Biggin, & Sterling, 1986). The charts will show the humidity changes during KGh and for at least three working days.

Then, the indoor humidity will be linked to outdoor temperature and weather changes. Moreover, the study will try to link any appearance of humidity impact on the building, such as moulds on the inner walls or corners, peeling paint and rust.

**e) Concentration of $CO_2$**

The concentration of $CO_2$ in indoor air will be linked to the maximum standards. The recommended concentration of $CO_2$ in KG is below 800ppm for an occupied building, which is important to be considered well ventilated, while the maximum concentration of $CO_2$ should not exceed 1,000ppm in such places (ASHRAE, 2002). Therefore, these limitations will be outlined in graphs that show the changes in $CO_2$ levels during KGh. These graphs will show when, for how long and by how much the $CO_2$ level may exceed the above standards. Then,

[44] Air temperature inside the KGs in winter season, when the external air temperature is -1$^{o}$C
[45] Air temperature inside the KGs in summer season (recommended)

by linking these figures with outdoor temperatures, children's activities inside these rooms, the number of occupants, and the weather conditions, the study can clarify the reasons and causes of any unacceptable levels that can constitute a health risk to children and to their educational attainment.

As mentioned before in this study, the high concentration of $CO_2$ relates to the health and comfort of all building occupants. The study will discover whether or not MOHE can ensure the minimum standard of $CO_2$ levels (ventilation) in their educational building through the current regulations, which aim to guarantee the quality of learning environment in these early educational facilities.

## 6.4.8. Data details (results): The first case (EL) KG

### 6.4.8.1. The lighting quality: The amount of light

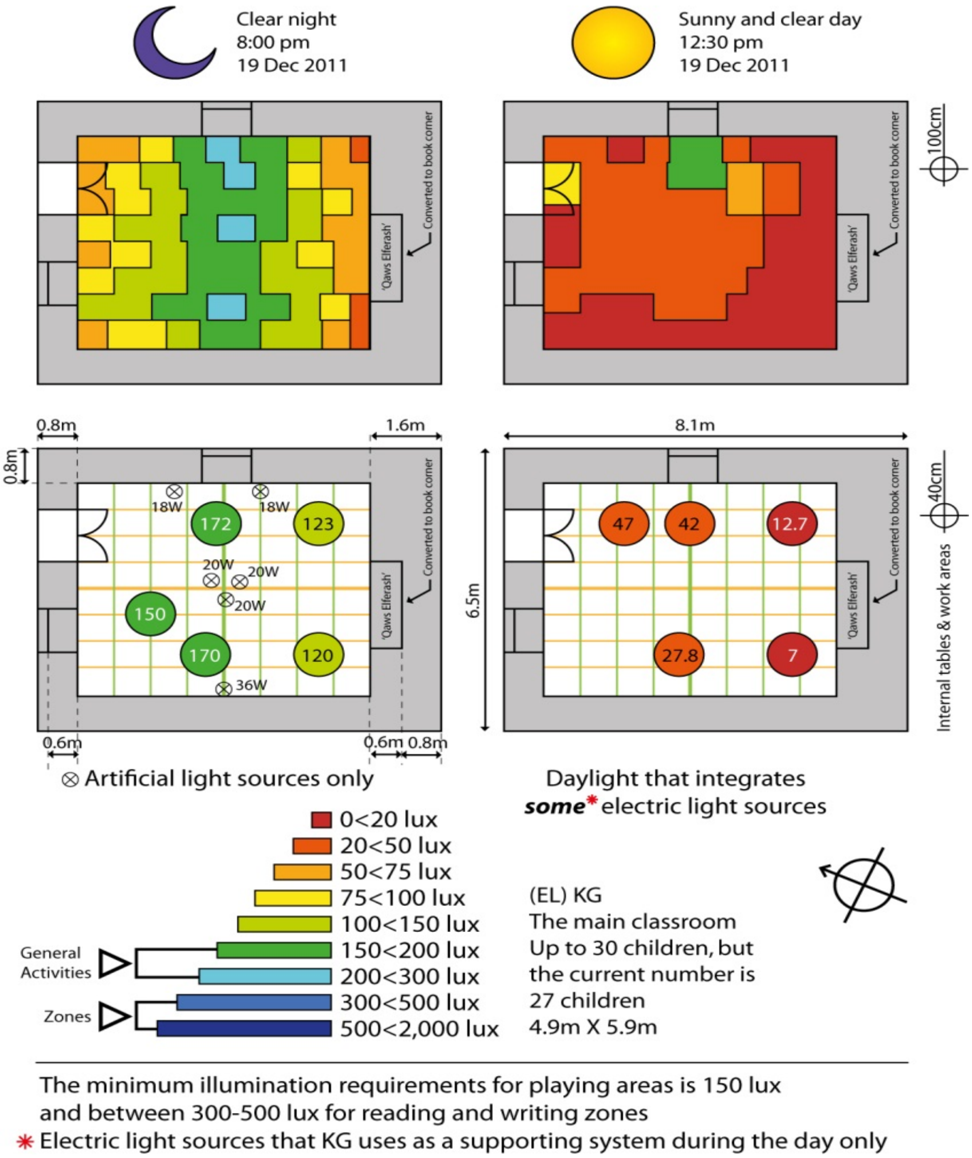


**Figure 162: The amount and distribution of light entering the main classroom of (EL) KG during a sunny day and a clear night. Room No. 10 (Figure 128) in the KG layout.**

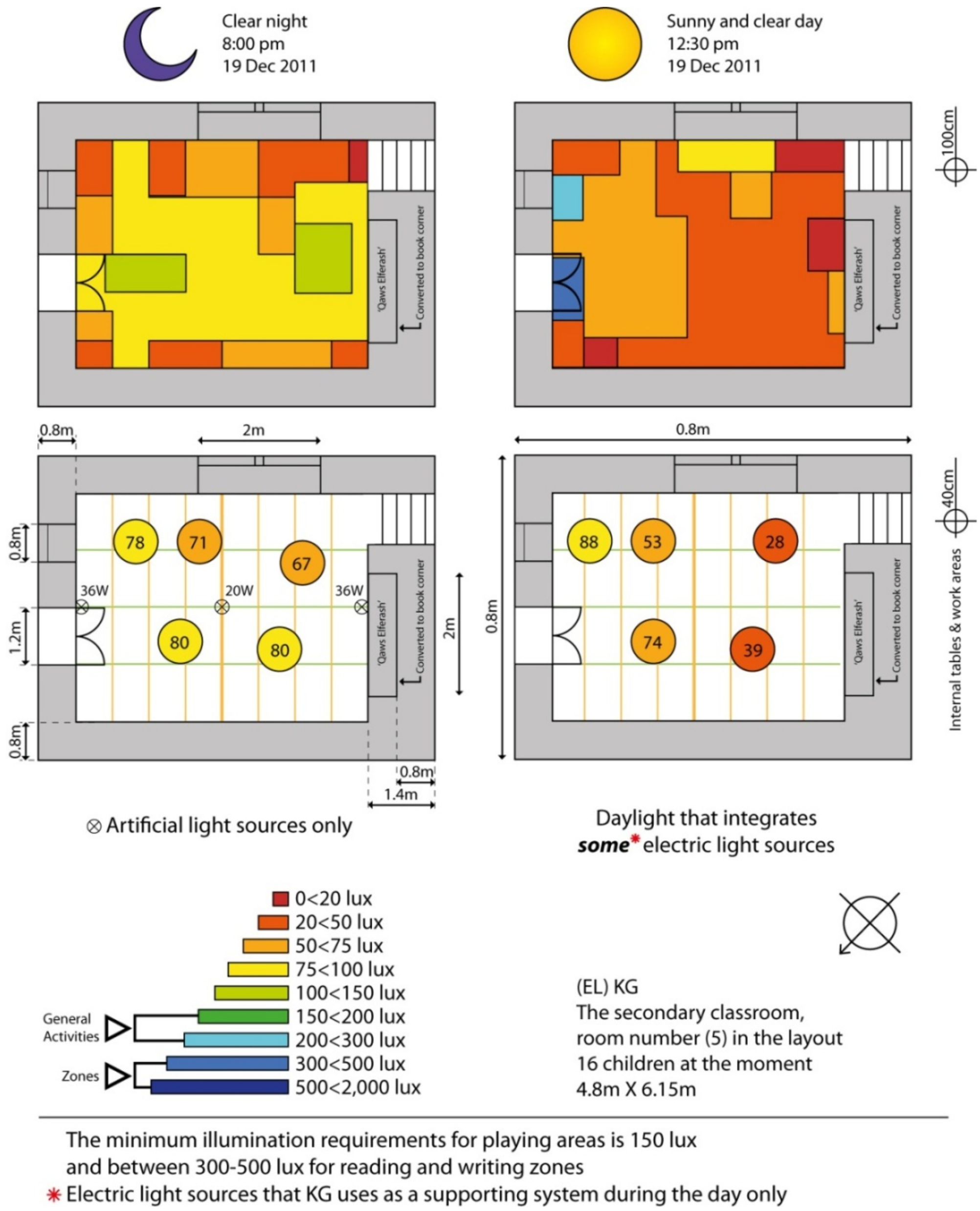


**Figure 163: The amount and distribution of light entering the secondary classroom of (EL) KG during a sunny day and a clear night, for more details see Appendix 7.**

Regarding classroom 2 (Figure 128: Room 1), it has been closed since Sept 2011 as a result of the low number of enrolment pupils, which has decreased from around 69 to 47 per semester (2011/2012). This classroom is used as a store, and is therefore excluded from the study.

In the previous experiment, the lux meter shows that the internal spaces of (EL) KG could not meet the international requirements of lighting quality, whether in day or night (Figure 164). The maximum covering that could be considered suitable for children's eye contact (80–100cm above the ground) during a sunny day was only 5.313% of the interior space in the main classroom and 0% in the secondary classroom. In addition, it was 0% in children's zones and activity areas such as reading, writing and painting activities inside both classrooms (40cm above ground level) (Table 25).

Although this KG does not open their doors during the night, the quality of artificial light systems was measured because they had been installed mainly to support any possible shortage of daylight during KGh. Therefore, by measuring the quality of the artificial light system at night (fully-loaded) the maximum support that the current system may forward during the KGh during the day, during most darkness conditions and in the winter seasons, can be discovered. Furthermore, the combination of an artificial light system and daylight is considered the best result that KG facilities can show in this issue.

Daylight (using windows, skylights, or light shelves) is often used as the main source of light during daytime in buildings. In this case, as a result of many factors such as the limited size and amount of classroom windows (for more details, please see Page 242), the internal spaces suffer from very poor lighting conditions, even when integrated with artificial light sources (lighting support systems). According to the KG landlord, these systems have been installed by non-specialists. Thus, they are not suitable in terms of their amount, ability, capacity, or distribution in the classrooms.

| | Percentage meeting the requirements of lighting (minimum of 100%), (EL) KG | | | | | |
|---|---|---|---|---|---|---|
| Time | Night (artificial light) | | | Day (daylight + some lighting support systems) | | |
| Type of tasks occur within the space | Visual tasks +40cm | General tasks +100cm | General tasks +40cm | Visual tasks +40cm | General tasks +100cm | General tasks +40cm |
| Min. Standards lux | >300 | >150 | >150 | >300 | >150 | >150 |
| The main classroom | 0% | 28.125% | 60% | 0% | 5.313% | 0% |
| The secondary classroom | 0% | 9.375% | 0% | 0% | 0% | 0% |

**Table 25: The amount of light inside the (EL) KG building during day and night, 19 December 2011**

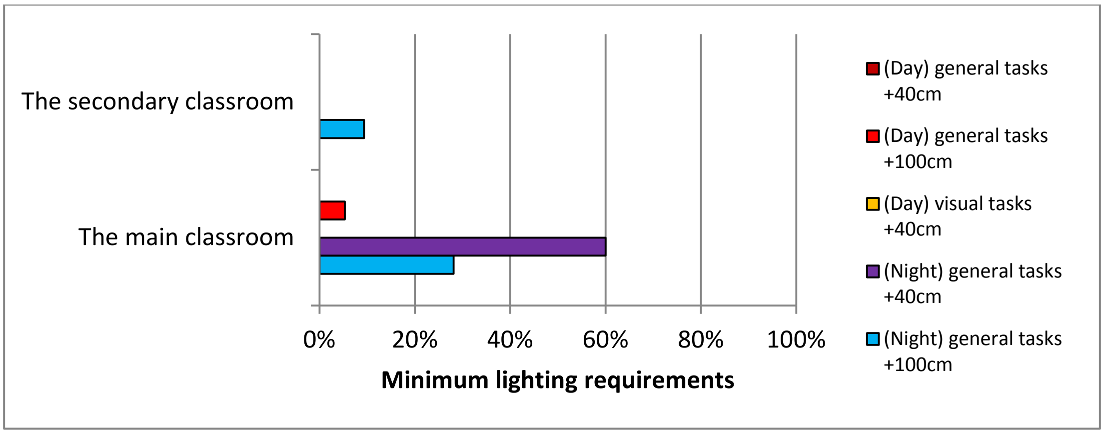


**Figure 164: The percentage of achieving the minimum lighting requirements inside the (EL) KG building during day and night, 19 December 2011**

During a sunny day (12:30 pm on 19 December 2011), and depending on the daylight and the daylight supporting system the KG uses to support the natural light, unfortunately, the main classroom could reach 0% of light requirements in the day, whether in spots (children's zones) or in the internal play areas. However, when using the full capacity of lighting supporting systems at night, the experiment shows that only approximately 28% of internal spaces of the main classroom are suitable for communication activities and play, whereas 0%

of spots are suitable for specific activities such as reading, writing, painting or playing games that required visual tasks. It is considered a serious problem because, although all MOHE regulations forbid certain types of curricula, for instance homework and teaching maths, at this age, this kind of KG – as with the vast majority of PS KGs – has many learning activities that require a high amount of light, ideally not less than 300 lux. Table 18 (Pupil's life-cycle at (EL) KG) shows that the KG programme has at least two kinds of reading activities (Reading Quran and Reading Arabic), mathematics, and painting. In addition, children are learning writing which requires a specific amount of light in these learning area 'zones'.

The pie charts (Figure 165) indicate that approximately 49% of (EL) KG's daily activities can be considered visual tasks needing special lighting requirements (between 300 and 500 lux). In addition, when it is focusing on the kind of activities that occur inside the classroom only (i.e. excluding playing outside) this intermediate visual task will be increased to around 57%. However, Table 25 shows that the percentage of appropriate spots for visual tasks is 0%, whether day or night. Moreover, the appropriate spaces for general tasks are 5.313% of the main classroom flooring during the KGh, whereas it is 0% in the secondary classroom for the same period.

**The type and the percentage of activities during (EL) KGh**

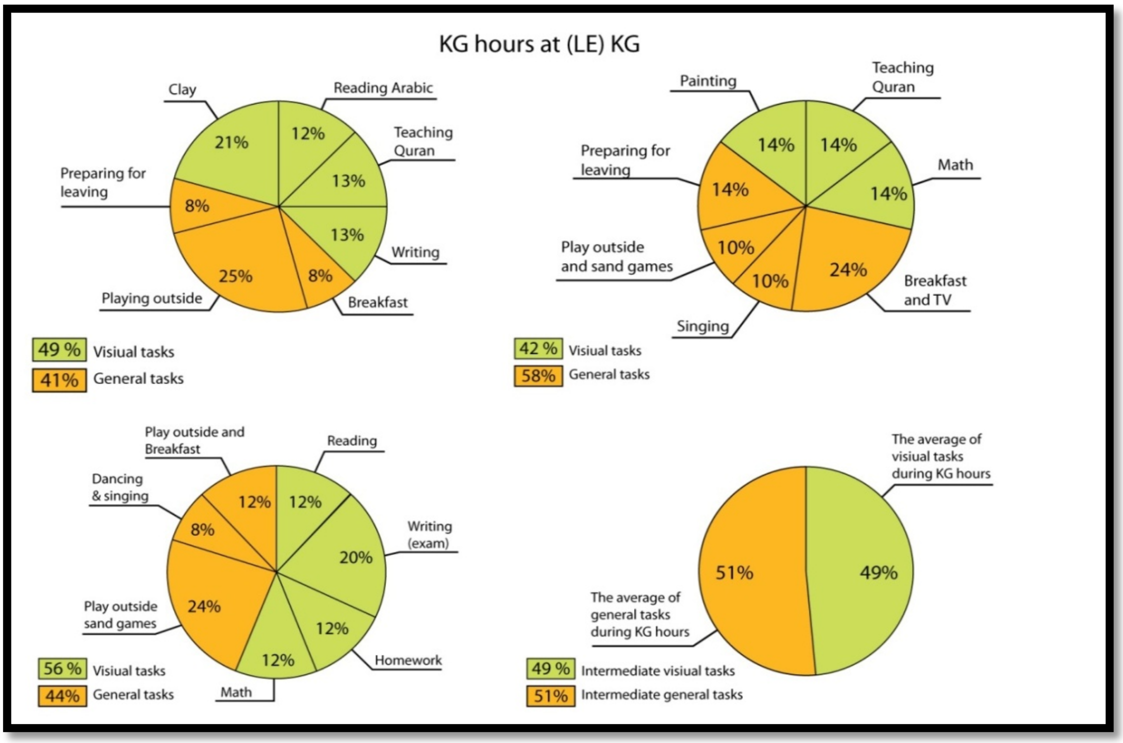


**Figure 165: the percentage of visual and general tasks during KGh at (EL) KG. These are linked to (Table 4) when the same program has been followed for the all classrooms**

Although these figures could be slightly increased at night (28.125% and 9.375% respectively) when KG administration uses the full capacity of the lighting system (Table 25), (EL) KG closes their facility at 12:30 pm and vacates all children and staff before 2:00pm. In addition, (EL) KG did not turn on the whole lighting system, either on a sunny day or a cloudy day, because they always try to save energy and reduce the electric bills, which are already high (according to the LE KG landlord).

The previous findings point out that there is today a significant difference between the daily needs of (EL) KG and the existing learning environment, which minimum quality MOHE is duty-bound to ensure by its current regulations and supervision of these educational facilities. Unfortunately, the study field shows that, in this case, the current licensing regulations could not achieve the minimum of this quality with regards to the lighting quality.

Based on the above findings, this experiment shows serious lighting problems in this KG, although it has a full licence that has been recently renewed after finishing all maintenance works. Such difficulties are predictable as a result of converting a PS traditional house (type one)[46] into a KG building. However, the real surprise was the size of this problem that the above figures show.

#### 6.4.8.2. Carbon dioxide ($CO_2$) rate of (EL) KG

$CO_2$ is toxic; in higher concentrations (1%) it will make some people feel drowsy, whereas the concentrations of 7% to 10% cause dizziness, headache, visual and hearing dysfunction, and unconsciousness within a few minutes to an hour that may lead to death. A rate of $CO_2$ between 385 and 800 ppm is considered to be well-ventilated, whereas 1,000 ppm is the maximum level of $CO_2$ allowed in indoor buildings (ASHRAE, 2002). For more information about the causes and impact of $CO_2$ on children's health and progress, return to the previous report, which covers the background of the quality of space in KG buildings (Page 264).

The experiment shows that (EL) KG has exceeded this limit, reaching a peak of (1,670 ppm) in the middle of a warm and sunny day (Figure 166). The main classroom in this KG could exceed the standard on such a sunny day as a result of closing the main door and almost the all windows of class 1 for only one hour and 34 minutes because of the cold weather in the morning ($7^{O}$C at 7am) before they opened it at breakfast time (9:30am, $10^{O}$C) for the remaining KGh. This explains the decrease of the level $CO_2$ during the second period and also keeps it below the standard (800ppm) until the end of the day.

Opening the door (while windows remained closed) could accidently address the problem by renewing the bad air of the classroom with fresh air that flows through the door. The good ventilation led to the rapidly decreasing $CO_2$ level. The graph (Figure 166) indicates this method, which was the result of improved weather and high temperatures in the afternoon, accorded (inadvertently) the fastest and most successful solution to this problem.

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[46] (Type one) is a sort of PS traditional house that is built from stone, earth and lime and has an 'Aqid' pattern. It has a simple structure that consists of 1–3 rooms with limited openings such as windows.

It should be pointed out that the amount of $CO_2$ in the classroom air is expected to reach much higher levels on rainy or very cold days[47] when they have to close the classroom door as well as all windows to keep heat in while children play inside the classroom for the entire day.

It can be seen what could occur as a result of putting 27 pupils for 1h 34min in such an enclosed space with bad ventilation, when the $CO_2$ level has increased rapidly to approximately 410% during this time to reach the peak at 1,670 ppm when it exceeded +67% of the maximum standard limit. It can be imagined what might result if the (EL) KG had to keep the pupils in for a much longer time and for all KGh (at least for 4½hrs) on cold and rainy days.

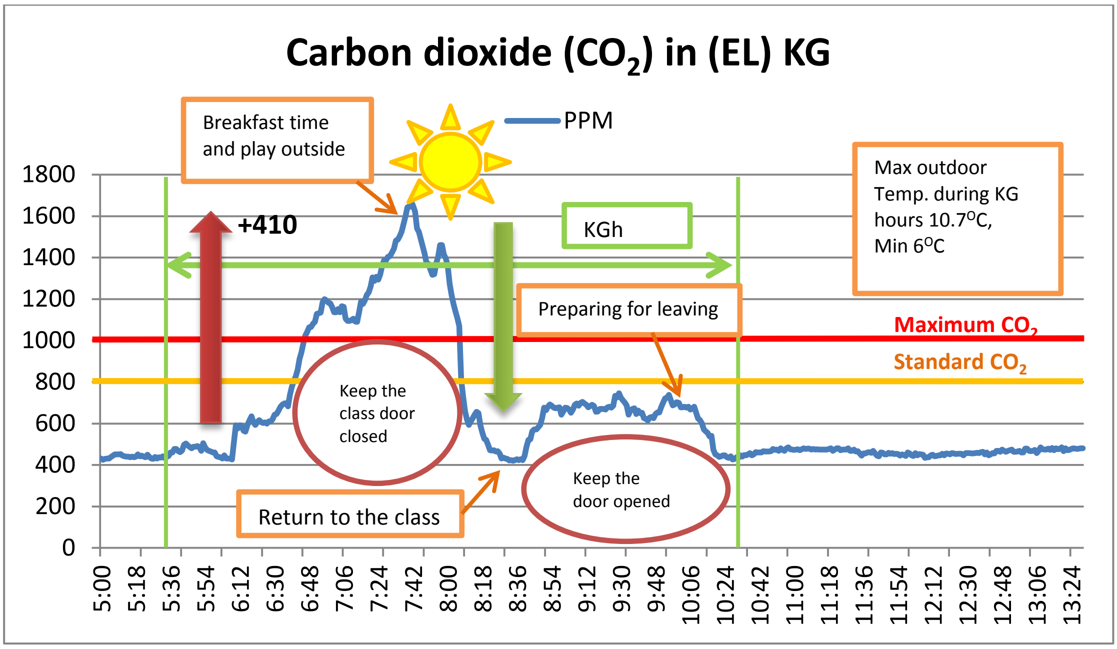


**Figure 166: Time (GMT +2:00) in Jerusalem 27 December 2011 (sunny day), this chart is linked to Table 18.**

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[47] Temperature falls below the freezing point in winter (-3°C) but parents used to stop sending their children to KGs when it is snowing or when temperatures approaching zero degrees

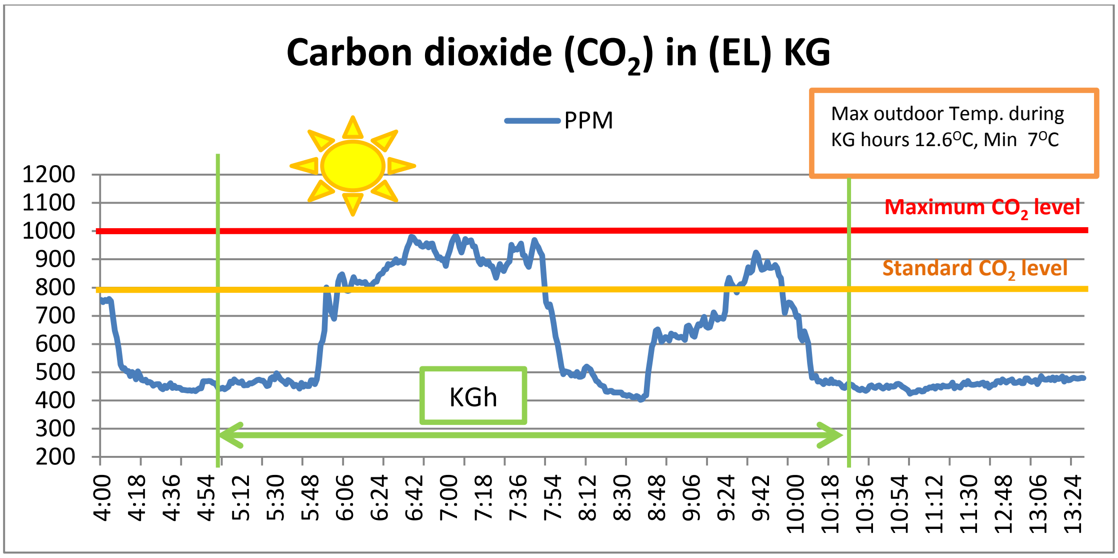



**Figure 167: The concentration of $CO_2$ inside the main classroom of (EL) KG on 26 December 2011. Time (GMT +2:00) in Jerusalem (while the main door of the classroom was left opened during the entire KGh).**

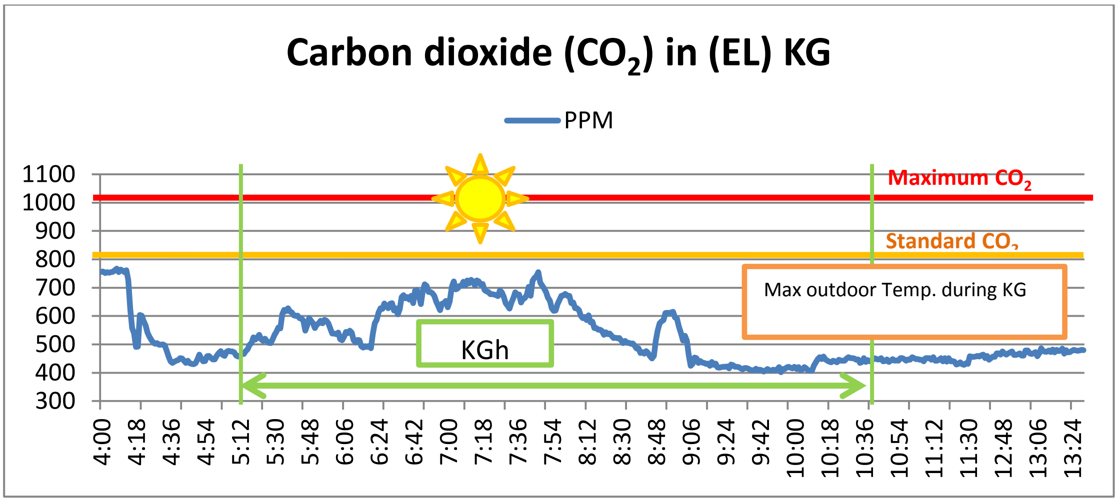



**Figure 168: The concentration of $CO_2$ inside the main classroom of (EL) KG on 22 December 2011. Time (GMT +2:00) in Jerusalem, (while the main door of the classroom was left opened)**

Figure 167 and 168 show that the concentration of $CO_2$ was below maximum standards during the entire KGh on 22 and 26 December 2011. Increasing the maximum outdoor temperature between 2$^{O}$C and 4$^{O}$C and the minimum outdoor temperature from 1$^{O}$C to 2$^{O}$C has left its impact on the indoor temperature and the $CO_2$ as well, since it allowed the KG to keep the windows and the main door of the classroom open for a longer time. This act allowed much fresh air to enter the room, which improved the ventilation inside this classroom. This explains the gap between the recorded figures on 22 and 26 December, and 27 December 2011 (Figure 166). It should be pointed out that, overall, the $CO_2$ during the experiment days was the best of three case studies (EM) and (MY) KG, which have been done in similar conditions.

#### 6.4.8.3. The outdoor temperature and humidity rate of (EL) KG

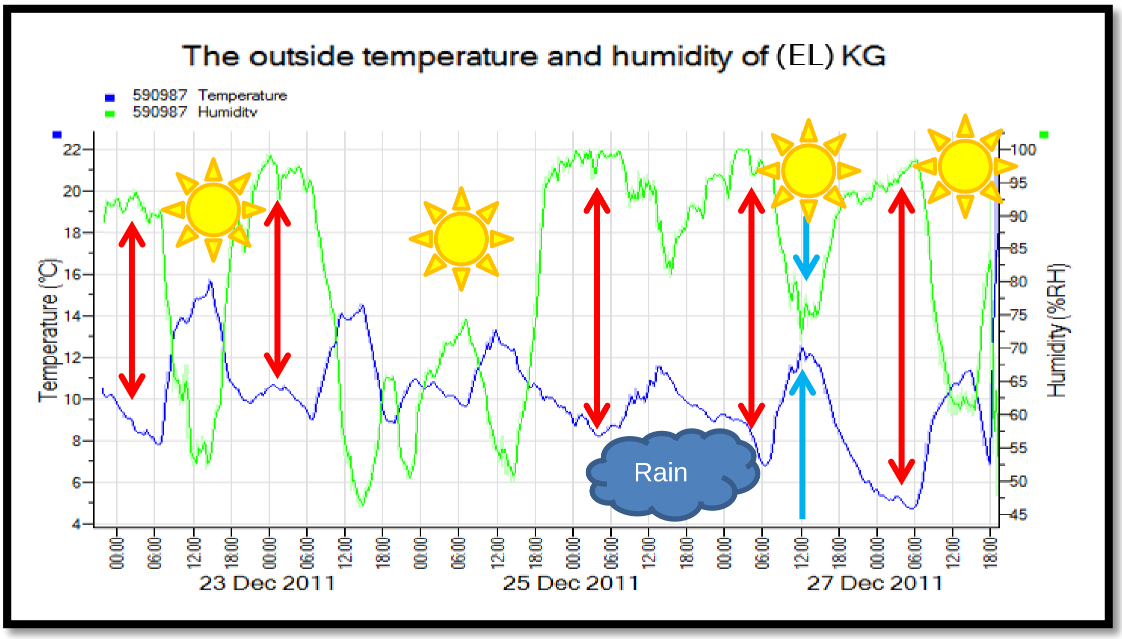



**Figure 169: The above chart shows both temperature and humidity rate during the experiment days 22, 26 and 27 December 2011**

The Stevenson Screen had been placed in the KG outside play area. The weather was sunny and clear on 22 December 2011 but it became rainy and partly cloudy between 26 and 27 December 2011. This explains the decrease of the outside temperature and the rapidly increasing humidity rate, which reached about 100% during the KG working hours on 26 December (7:15 am). The maximum temperature within the experiment days was 15.74 $^{O}$C, whereas the minimum outside temperature was 4.7 $^{O}$C at 6:00am on 27 December 2011 (Figure 169). It is noted that the relationship between the heat and humidity here is an inverse relationship. In other words, when there is an increase in the humidity, there is a decrease in temperature at the same time, and vice versa.

Moreover, the KG building has been built of high insulation materials such as earth and lime, which impacts on the difference between the internal and external temperature. This difference reached between 2.3$^{O}$C and 8$^{O}$C on 23 December 2011 (Figure 169 and 171). This indicates that the thick insulation walls and ceilings are active, although with the complete absence of effective heating systems. The advantage of the PS traditional walls is to keep heat/cold inside the room for as long as possible, but the lack of heating methods reduces the efficiency of insulation walls.

It should be pointed out that the (EL) KG keeps the windows of classrooms closed (as the majority of PS KGs in this study), and it is noticed that they have never been opened during KGh in the (EL) KG building, although the weather was sunny and warm at least at noon (between 16$^{O}$C and 10$^{O}$C).

#### 6.4.8.4. The internal temperature and humidity levels at (EL) KG

It should be pointed out that all teachers as well as children have to wear their coats and heavy clothes inside the classroom as a result of a lack of heating system, and to reduce bills. This act may make up the difference of heat, which makes the recorded temperature more acceptable. However, there are two issues. First, what is the amount of protection provided by children's clothing, and are they able to make up the difference between the temperatures, which reaches between approx. 4.2$^{O}$C to 8.5$^{O}$C below the minimum standard temperature during KGh (Figure 169 and 171-172)? This point remains an open question. Secondly, this heavy clothing (several layers), in addition to the coats, has

**Figure 170: Similar heater that is used in some PS KG buildings**

a major role in blocking the movement of the child, thereby hindering the activities that require running and playing or composition, for example.

The KG has only one electric heater (Figure 170), which is used in emergency only. Moreover, in this case this device will be used only by the KG landlord when the temperature drops, which is not efficient in reducing the temperature in such a big classroom (28.91m$^2$). One electric device cannot help solve the temperature problem in the other two classrooms.

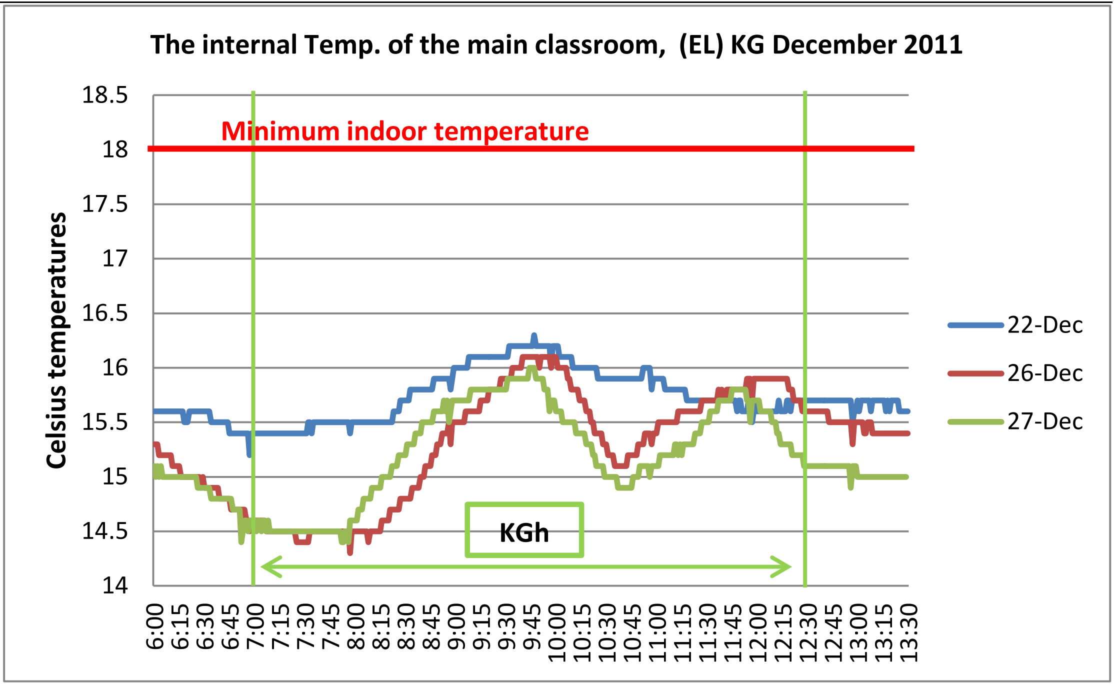



**Figure 171: The chart shows the internal temperature of (EL) KG (the main classroom) during the length of time children are likely to be there, between 07:00 and 12:30**

The above graph (Figure 171) shows that the average temperature of the main classroom as well as all (EL) KG classrooms is lower than the minimum standard, which is 18$^{O}$C (NUT, 2011).

Although officially there is no prescribed maximum temperature for educational establishments or any other workplace, the Workplace (Health, Safety and Welfare) Regulations 1992 require all staff to take all reasonable steps to ensure that a ‘comfortable’ temperature is maintained. Furthermore, the Association of Teachers and Lecturers (ATL) in the UK (NUT, 2011) and the World Health Organization (WHO & UNEP, 1985) believe that, in temperate climates, the ideal indoor temperature is between 18°C and 24°C.

**The difference between inside/outside temperature in the main classroom of (EL) KG**

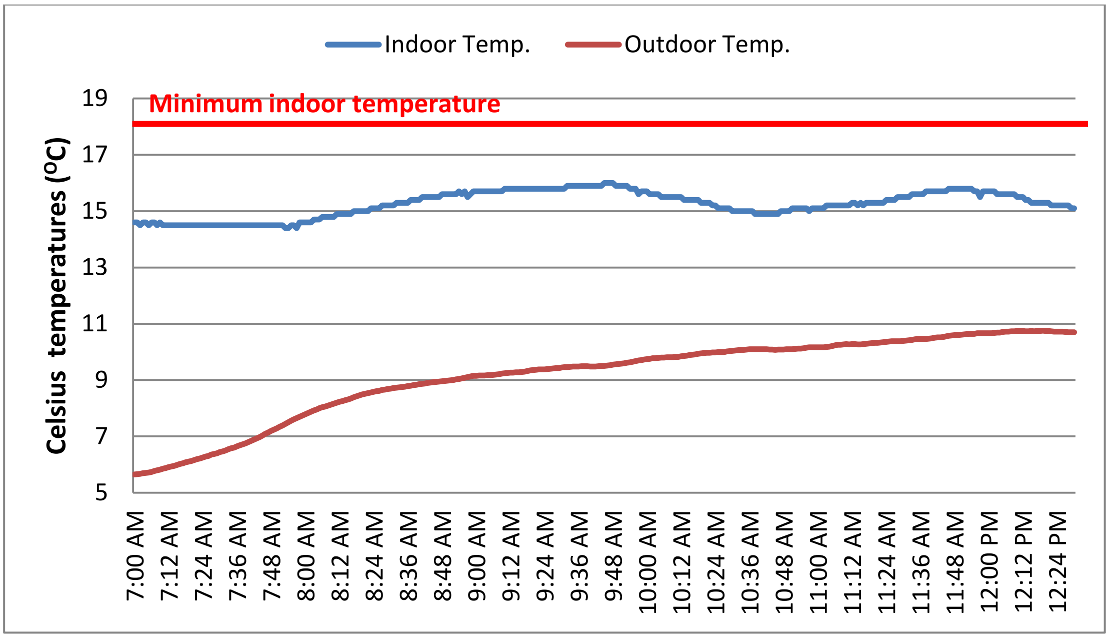



**Figure 172: The chart shows the difference between the indoor and outdoor temperature without using any kind of heating methods during KGh in (EL) KG (27 December 2011)**

The chart shows the quality of temperature insulation in PS traditional houses that have been converted to KG facilities. These results will be compared with modern buildings that have been converted to KGs.

Figure 172 shows that although the outdoor temperature has changed from 5.7$^{O}$C to 10.8$^{O}$C with an average temperature of 9.2$^{O}$C during the (EL) KGh, the internal temperature of theclassroom was more stable: around 15.2$^{O}$C[48]. Moreover, the humidity was stable in this type of building during all KGh (Figure 172).

[48] Minimum 14.4$^{O}$C, maximum 16$^{O}$C during KG hours, 27 Dec 2011

Regarding the indoor temperature, 15$^{O}$C is lower than the KG temperature standard, which should not be below 18$^{O}$C[49] when the external air temperature is -1$^{O}$C (United Kingdom Parliament, 1999). It should be noted that in this case the minimum indoor temperature was exceeded when the average outdoor air temperature was only 9.2 $^{O}$C during the KGh.

Figure 173 shows the same problem in terms of internal temperature, which was below standard during KGh. The recorded temperatures were between: 15$^{O}$C and 15.5$^{O}$C on 22 December; 14.3$^{O}$C and 14.7$^{O}$C on 26 December; and 13.8$^{O}$C and 13.9$^{O}$C on 27 December 2011.

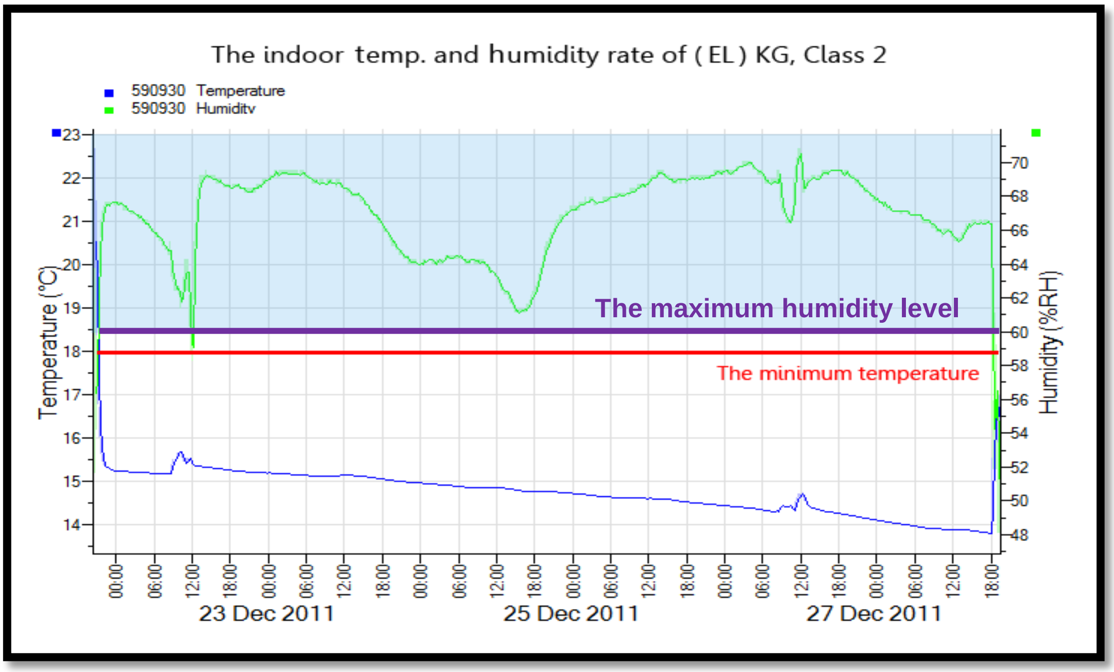



**Figure 173: The internal temperature and humidity rate of the second classroom, between 22 and 27 December 2011**

[49] The minimum standards of 18$^{O}$C for children and 16 $^{O}$C for adults in high activity places such as the gym (United Kingdom Parliament, 1999)

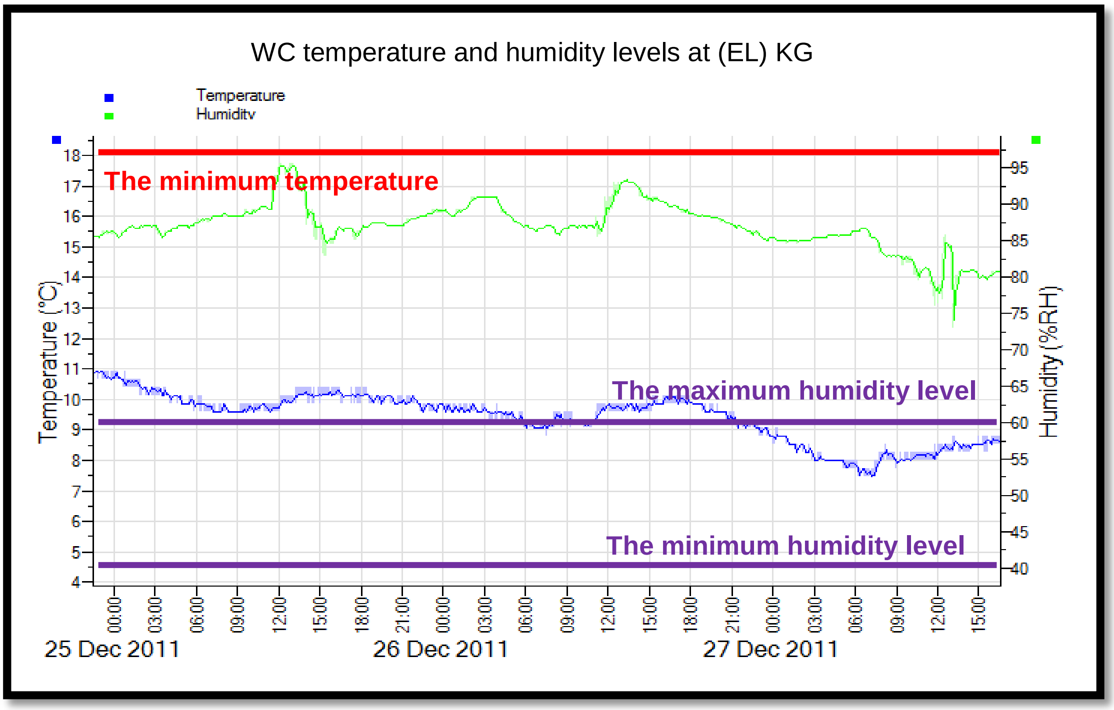



**Figure 174: The internal temperature and humidity rate of the water closets of (EL) KG**

The previous chart (Figure 174) shows that (EL) KG lavatories are too cold, 7.6$^{O}$C to 10.2$^{O}$C below the minimum standard of non-teaching areas (16$^{O}$C) during KGh. This presents another problem that must be addressed as soon as possible, since the health of pupils is at risk (WHO & UNEP, 1985) (WHO, 1987).

### 6.4.8.5. Humidity

Humidity control is a vital factor in improving indoor air quality. High indoor humidity levels create the perfect breeding ground for unwanted mould, bacteria and fungus (Figure 178), which are the main causes of allergies, especially among young children.

The graph (Figure 173-174 and 178) shows that the air in the KG building is too humid. It reached 11 degrees above the recommended limit, which creates an uncomfortable environment. The acceptable humidity levels for indoor KG classrooms are between 40% and 60% (ASHRAE, 2002).

Moreover, the high humidity level during long periods has a negative impact on the building structure (W.H.Ransom, 1987, pp. 45, 83), such as:

- It causes structural degradation of buildings
- It makes timber wall cupboards, carpet, and even children's books rot
- It causes damage to the wall plaster and paint (Figure 175)
- It deteriorates electric installations
- It causes iron rust (Figure 177)

**Figure 175: High humidity in the building**

**Figure 176: Mould on the KG lavatory ceiling**

**Figure 177: Iron rust**

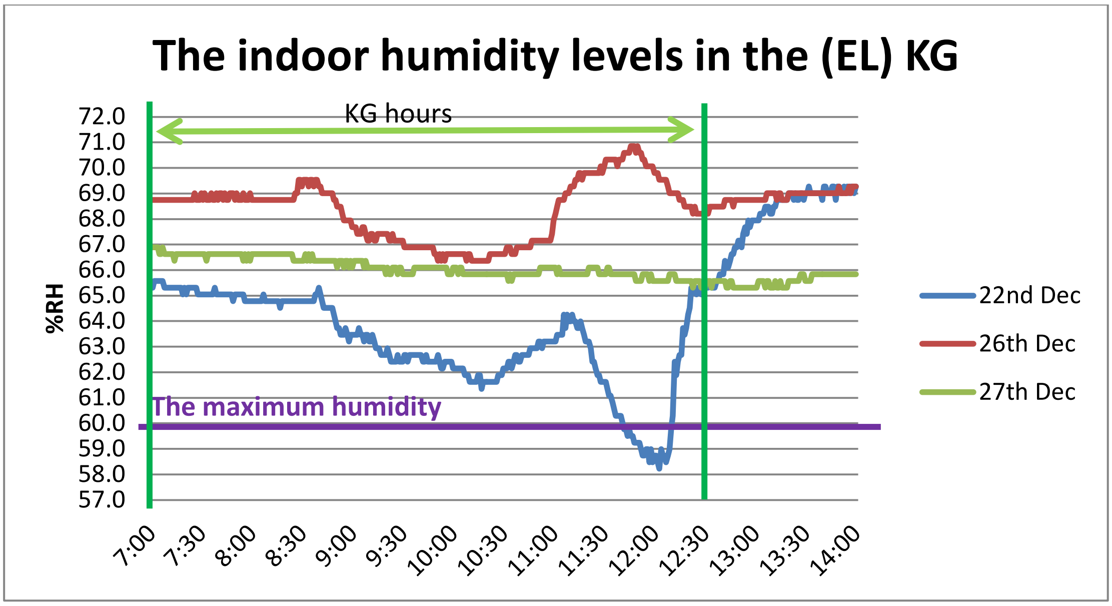



**Figure 178: Humidity levels inside the (EL) KG classrooms, between 22 and 27 December 2011**

The chart below shows one of the advantages of converting a PS traditional building to a KG facility. The KG building in this case not only has a more stable temperature than the modern buildings (Figure 172) but also has more stable humidity (Figure 179). It seems that the PS traditional building was less affected by outdoor humidity, even when it reached approximately 97%RH.

It is believed that this occurs as a result of the building structure (thick walls), the nature of the materials (stones, oil, lime and earth) and design.

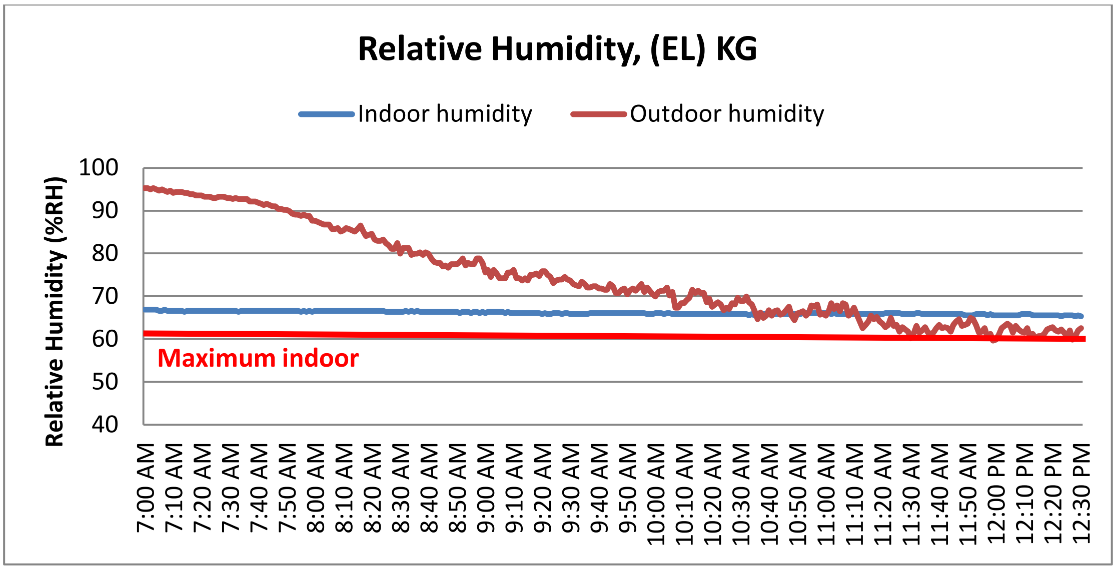



**Figure 179: The difference between indoor/outdoor humidity levels in (EL) KG**

Figure 308 shows that the average indoor temperature and indoor humidity exceeded the recommended limit (+18$^{O}$C/60%RH) during the KGh. In addition, 3/7 of the KG activities were done under poor air quality conditions because of the high concentration of $CO_2$ levels, where the average level of $CO_2$ reached 1,475.4ppm. It should be noted that the average indoor temperature was more stable and less affected by the external changes, even with the absence of heating systems at this KG. This could refer to the thickness of PS traditional walls and the materials used in its structure. The difference between the outdoor and indoor temperatures will be measured to identify the impact of PS traditional methods in building on the change of weather, especially with the absence of heating systems in all facilities in this study. This section will be covered at the end of the three case studies.

#### 6.4.8.6. Extra problems related to the (EL) KG management

Although it has been refurbished recently by using the Qatar Grant of $15,000, (EL) KG still shows the following problems:

- Unprotected and uncovered water pumps, which are easily accessible by children, increasing the hazards of electric shocks. The moving parts of the water pumps could be very dangerous to children’s fingers if they try to touch them (Figure 180).
- Overloaded sockets and uncovered wires could lead to fire hazards or electric shocks (Figure 181).
- Installed inappropriate metal doors and stairs have sharp corners and edges. In addition, the metal doors have parts that could easily trap or pinch children’s fingers (Figure 182).
- Uncovered hot water pipes not only increase the rate of wasted heat and increase the heating bills, but also could be harmful if children touch or play with them.
- No fire alarm system has been installed in the KG.
- Use of kerosene heaters and gas burners (until 2010), which not only increase the level of $CO_2$ rapidly in closed and limited areas but also increase the level of CO. The high level of these two kinds of gas could be very dangerous for health, especially when compounded with poor ventilation spaces.
- A manhole is located in the play area, which is an explicit violation of the PS regulations (Figure 145).
- The inappropriate kitchen does not have necessary appliances or cupboards, and the tap water was out of service
- A general lack of maintenance works.

In conclusion, it can be noted that the majority of the above problems are related to management issues, which has led to a lack of safety procedures in KG facilities and a lack of proper maintenance works for the building.

**Figure 180: Uncovered pumpers**

**Figure 181: Overloaded plug sockets**

**Figure 182: Metal door that is unsafe for children to use**

**6.4.8.7. Summary**

The results of the (EL) KG case study and analysis of its outcomes show that the current PS regulations could not guarantee, in this case, the quality of learning environment that is related to quality of space. During KGh, the main classroom could achieve 0% minimum temperature and humidity standards for the entire day, when the average outdoor temperature was approximately 8.92$^{O}$C on a sunny day (December 2011). In addition, for 52.94% of the time (90/170min) on 27 December 2011, which children spent inside the main classroom for KG activities, children were suffering from a high concentration of $CO_2$. It should be pointed out that all previous figures could easily be worse during February, when the outdoor temperature reaches freezing point in this region.

**A) Unapplied regulations**

The (EL) KG bypasses the current PS regulations (2010) at many points, by ignoring the items below, which are:

| Item No. | General regulations | |
|---|---|---|
| 4. | Each activity must not exceed 30 minutes (Table 18) | X |
| 5. | There is no homework (Table 18) | X |
| 6. | There are no exams or marks, but there is feedback for assessment (Table 18) | X |
| | **A) Indoor** | |
| 4. | The building should be well-lit (Table 25), have good ventilation and appropriate lavatories that meet the engineering and health requirements (Figure 166) | X |
| 5. | The KG building should be detached and have its own entrance (Page 239) (Figure 128) | X |
| 8. | One lavatory for each 20 children, or less (in this case study each lavatory was originally built to serve more than 30 pupils plus to their teachers) (Page 256) | X |
| 10. | There should be proper water outlets for drinking that are fit for a child's scale (the majority of them were out of service, Jun/Dec 2011) | X |
| 11. | There should be proper water outlets for drinking (Figure 144) | X |
| | B) Outdoor | |
| 5. | It is prohibited to install a manhole in the outdoor play area (Figure 145) | X |
| 6. | Part of the outdoor area should be used for planting flowers (NOT available) | X |
| | The KG furniture and equipment | |
| 4. | A cupboard without handles for each child to store her/his personal belongings; in addition, each cupboard must have a hanger for their coats (NOT available) | X |
| 6. | Part of the multi-activity room should be covered by carpet (BUT this was added later, Dec 2011) | X |
| 7. | Administration office and library should be furnished (there is no administration office, but there is a story corner) | X |

contd.…/

| | | |
|---|---|---|
| | The KG furniture and equipment | |
| 8. | The KG building should have a proper kitchen (the field studies in Jun/Dec 2011 show that there is an absence of necessary appliances, cupboards and the tap water was out of service in the (EL) KG) | X |
| | The outdoor toys in KGs | |
| 3. | Should be kept at least 3m between one game and another (the outdoor toys) | X |
| 4. | Three-wheel bicycle, small trolleys for children's use (NOT available) and other suitable toys | X |
| 6. | Gardening tools that are appropriate for children (NOT available) | X |
| | Methods of protection and safety in KGs | |
| 4. | KGs should be free of obstacles such as stairs (Figure 133) | X |
| 5. | KG gates and walls should be safe and secured (Figure 126 and 182) | X |
| 7. | If the KG wall is too low, the KG should have a fence for protection (Figure 123) | X |
| 8. | Safe electric sockets should be installed at a high position (Figure 181) | X |
| 9. | All sorts of stairs should have a handrail, regardless of the number of these stairs (NOT available) | X |
| 10. | The main entrances must have barriers in front of them for protection (Figure 125)[50] | X |

**Table 26: Table shows the missing items that (EL) KG could not meet in terms of the current PS regulations, 2011**

All previous results, added to very poor lighting conditions inside the (EL) KG building, will not only create an uncomfortable environment, but also an unhealthy and unsafe environment for all occupants, especially the young children. Therefore, it seems that MOHE cannot reach its aims for a healthy and safe learning environment using current KG building regulations (MOHE, 2012).

[50] For more information return to page 246

**B) Advantages and disadvantages of the (EL) KG**

a. Advantages

1. Has a unique architectural character that reflects the PS culture in its colours, lines and design
2. Protects and preserves a PS traditional building from demolition and collapse through reconstruction and reuse as a KG which serves the local community
3. Brings greater harmony with the local environment by using sustainable materials
4. Its location is close to both the town centre and congested urban areas
5. The precious outdoor spaces, comparison with the modern houses
6. The maintenance of traditional houses to be used as KGs is much cheaper than building new KG facilities.

b. Disadvantages

1. The opportunity for a relationship between the indoor spaces and the outdoor spaces is missed
2. The opportunity for a relationship between the outdoor spaces and the outdoor environment is missed
3. Inappropriate for chair wheel users
4. No heating systems
5. No fire alarm system
6. Very poor lighting quality during KGh
7. High humidity and $CO_2$ levels during KGh
8. Low indoor temperature as a result of the absence of any heating system
9. Shares its entrance with other occupants
10. Not easy to modify the structure and redistribute its interior spaces because of the width of its walls and the methods of building, because in PS traditional buildings walls hold the entire load

11. Does not have ‘legal free spaces’[51], which are supposed to be located between the KG building lines and other neighbour buildings. In other word, it does not have an unoccupied open space on the ground level that separates buildings
12. Does not respect children’s scales[52]

[51] The minimum open spaces between buildings in this area is 4m
[52] Related to the lavatories kit, stairs dimensions, openings mechanism and their height installations, door safety requirements for children’s use

## 6.5. THE SECOND CASE STUDY: (EM) KG

### 6.5.1. The importance of the KG as a case study

The field research shows that a lot of current KG buildings were originally built in the period between the 1940s and 1970s. These buildings are still in good condition and they are easy to maintain even if they were vacant for many years because of the nature of materials that have been used in their structures. On the other hand, the PS traditional buildings ‘Aqid’ style, which were been built before the 1940s, are expensive to maintain if they have been vacated or neglected for many years for two reasons: firstly because of the nature of the materials, which require yearly maintenance, and the secondly because the expertise needed for reconstruction is no longer available. In addition, as a result of the Israeli occupation of the West Bank in 1967 a lot of Palestinians were killed, displaced or escaped from war[53]. This situation provided many homes of the type which were built before the war, which can be purchased, rented, or reused for a very low price.

Most investors in the field of kindergarten buildings had gone toward these specific types of buildings for many reasons, such as: these houses were built on the outskirts of cities or villages, which later became in the heart of new neighbourhoods, where other alternative modern buildings in such region are expensive to rent or purchase; these buildings have traditional patterns, the majority of them not only were built as detached buildings but also have spacious back yards, which are required for such schemes.

### 6.5.2. KG background

#### 6.5.2.1. History of the building

According to the landlords of (EM) KG, the original house was built in the early 1950s. The date of the building is very important because the building was established in the middle periods between the traditional house period ‘old school’ and the modern period ‘new school’. Therefore, this building is influenced by both stages.

[53] Arab-Israeli Wars: conflicts in 1948, 1956, 1967, 1973, and 1982

The house was inhabited by ordinary people, who wanted to keep construction costs to a minimum. This left its impact on the room sizes, building pattern, and materials used in construction.

#### 6.5.2.2. Space syntax

There is an absence of the ‘Aqid’ style but, as a result of the influence of ‘old school’ building, the traditional white stones are used for cladding the outer walls and it follows the same sample pattern of distribution of the spaces of PS traditional houses (Type one). Furthermore, it can be noted that the lavatory in this house is not attached directly to the main building but is separated, following the pattern of traditional buildings in PS (Figure 189) (Appendix 4).

#### 6.5.2.3. Structure

The building is considered a simple building that consists of three classrooms. The roof is flat and the ceiling height is lower than in the average PS traditional house (4.5m–6m). The thickness of the external walls is around 30cm, and only 15cm for the internal walls, which is in contrast to PS traditional walls (60cm–180cm). The building is fenced by a high concrete wall (200cm–225cm) for more protection and to increase privacy. On the other hand, this simple house keeps some traditional features, such as windows that are installed in a high position (Figure 197), openings which are small and limited, and service areas such as toilets and kitchen which are located in the far corner of the back yard in order to be as far as possible from the eyes of curious people and passers-by from the main road (Figure 189). This system has been followed too in the shaded area (outdoor rest area).

#### 6.5.2.4. Materials

According to Shokry Arraff (1985) and Omar Hamdan (1996), after the 1940s, building methods and building materials developed rapidly in this region. In this case study, the original house was built in this era when ordinary people were shifting towards the use of ‘modern materials’ such as concrete and cement blocks instead of ‘traditional materials’ such as lime, earth and oil.

The widespread use of new materials such as cement, which became available at a reasonable price in the local market, encouraged local people to start using it little by little in their homes. It should be pointed out that despite this development, local people, at this stage, were still trusting in their traditional patterns with some changes.

These changes occurred because the new materials had a great impact on building methods, which had a clear impact on the PS traditional patterns. For instance there is no need for thick walls, because of the strength of cement that became commonly used.

**6.5.2.5. Characteristic**

- It was visited on 19 June 2011 and December 2011
- Fully licensed KG
- Licensed to receive up to 40 children (However, it had 42 in 2010/2011 and 47 in 2011/2012)
- Three teachers (including the landlord) and one for cleaning service
- Construction area $60m^2$
- Land space $234m^2$
- The building is rented
- The building is a PS traditional building (type one). However, with the passage of time, the original owner has added a room for expansion. Then, it was converted to become a KG
- Has health insurance for all children (staff not included)
- Has twice annual health check for all children at KG
- KG’s public holidays are typical for the school system, which are set by the MOHE
- KG days are usually between 4 September and 12 June

- Tuition fees in 2010/2011 were 70 NIS[54] monthly per child ($20.50), as for all PS KGs in this study.
- The schools have to pay an annual income tax: 12 NIS for each child per year plus 10 NIS each month. Therefore, for a KG that has 42 pupils they are supposed to pay 3,864 NIS if they have worked for eight months ($1,335)
- Pupil's life-cycle at (EM) KG

| Time | 6:30≤8 | | | | | | 8≤9 | | | | | | 9≤10 | | | | | | 10≤11 | | | | | | 11≤12 | | | | | | 12≤13 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 06:30 | 07:10 | 07:20 | 07:30 | 07:40 | 07:50 | 08:00 | 08:10 | 08:20 | 08:30 | 08:40 | 08:50 | 09:00 | 09:10 | 09:20 | 09:30 | 09:40 | 09:50 | 10:00 | 10:10 | 10:20 | 10:30 | 10:40 | 10:50 | 11:00 | 11:10 | 11:20 | 11:30 | 11:40 | 11:50 | 12:00 | 12:10 | 12:20 | 12:30 |
| 28 Dec 2011 | Open the facility to receive children | | | | | | Reading Arabic | | Chatting | | Singing | | Breakfast & play outdoor | | | | | | Writing | | | | Watching TV | | Math | | | Outdoor games | | | Preparing the first group for leaving | | | |
| 29 Dec 2011 | Open the facility to receive children | | | | | | Teaching Quran | | | | Breakfast & play outdoor | | | | | | Reading (Arabic) | | Writing | | | | Painting | | | | | Exam | | | Preparing the first group for leaving | | | |
| 2 Jan 2012 | Open the facility to receive children | | | | | | Reading Arabic | | | | Math | | | Telling a story | | | Breakfast & play indoor | | | | | | Clay | | | | Singing | | Homework | | Preparing the first group for leaving | | | |

**Table 27: Pupil's life-cycle during the experiment days (28, 29 Dec 2011 and 2 Jan 2012) at (EM) KG and for all classrooms**

[54] NIS is an abbreviation for the New Israeli Shekel, which is the currency of the State of Israel and it was equal to 0.178 British pounds in July 2011.

## 6.5.3. The general external view of (EM) KG

## Analysing the external view

### 6.5.3.1. Location

The (EM) KG is not located in a crowded area. The majority of houses in this area were built between the 1940s and 1970s, with a separate garden. In addition, buildings in this quiet area are never more than three storeys high. The (EM) KG has the same features. It consists of one ground floor only, which is located on the main road. It is noted that there is a lack of a sidewalk and barriers that would prevent students from running directly onto the street, exposing themselves to the high risk of accidents (Figure 184 and 187). Unfortunately, this situation has been seen and repeated in many PS KGs. Moreover, as in other KGs, this KG does not contain any car parking or zones for dropping off/picking up students by their parents' vehicles.

**Figure 183: The location of (EM) KG. Photo by Google Earth**

**Figure 184: The outside view shows the main entrance and some drawings, which contains the name of the KG and welcoming words**

### 6.5.3.2. Entrance

In the KG entrance, coloured tyres have been used as an interior fence (Figure 185 and 186). The outdoor play area has been divided into zones depending on their flooring. The first one has been covered by a thin layer of sand, where some toys were installed (Figure 185 and 190-191). The other zone has been covered by a layer of concrete to be used as a play area or as pathways (Figure 185-186). The KG has a front terrace, which is partly shaded by a grape tree (Figure 188 and 189: 3). In addition, it has another terrace on the north side that has been shaded by a group of grape trees (Figure 186 and 189: 14). This area was originally used as a rest area for the landlord's family members in the hot summer days, when the temperature rises inside the home at noon, in order to take advantage of lovely summer breezes.

**Figure 185: The picture shows the external footpath in the KG play area and the sand game area**

**Figure 186: Outdoor footpath in the play area**

**Figure 187: The main road on front of (EM) KG**

**Figure 188: Tracing on front of the main door of classes**

#### 6.5.3.3. (EM) KG's Layout

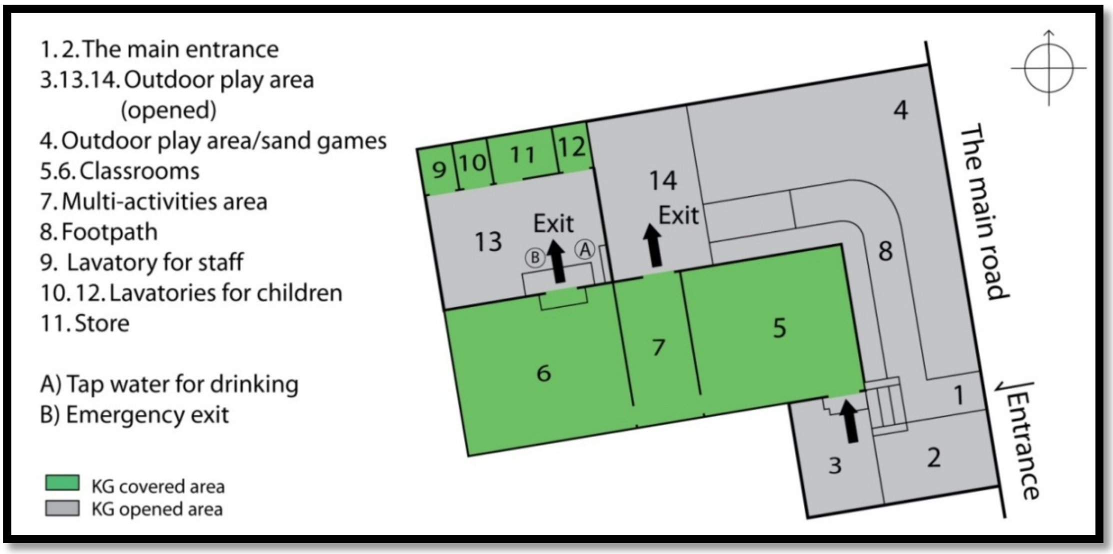



Figure 189: (EM) KG layout

#### 6.5.3.4. Outdoor play areas

Although the KG building and outdoor play areas were clean and tidy, the KG entrance and the main gate have not received the same care (Figure 187).

Figure 190: Double swing in the outdoor play area, which is shaded by two trees

The KG has outdoor playground equipment and toys such as swings (Figure 190). However, some of these toys are unsafe, and others are seriously dangerous (Figure 191).

This conclusion has been reached not only by recording the unrounded and sharp corners of these toys and the unsmoothed wooden surface and edges that create small splinters

(Figure 230), but also by the number of serious injuries – even broken legs – that such toys' moving parts have caused (Figure 191) [55]. These games are made in local blacksmith shops, which suffer from the lack of necessary equipment and expertise to design and build this kind of toy.

In addition, they have used poor materials. All these factors not only lead to producing 'toys' that cannot help prevent safety and security incidents from occurring, but also to producing a colourful deadly trap that targets young children in an educational facility. This, unfortunately, occurs under the blessing of the Ministry of Education by granting such KG facilities full licences.

**Figure 191: Dangerous outdoor toys in (EM) KG**

It should be pointed out that, although some KGs that use such toys have acknowledged they are dangerous for their children after seeing their negative impact, they keep using the same toys after simply making some modifications. Regardless of these ineffective changes, a KG director (summer field research 2009) clarified that the real reason for keeping this 'toy' in her facility despite the number of injuries, which occurred in a short period, is due to: first, the high cost of replacing such an expensive toy, especially the imported ones; and second, because of its popularity among young children, especially the newcomers.

[55] In the research study, it was been reported that an identical toy caused three serious injuries, which necessitated a transfer to the clinic for immediate treatment, while two cases of fractures in three years were recorded between 2006 and 2009. In addition, similar toys with much poorer conditions have been reported in PS KGs in Nablus Province, Summer 2010.

The high wall that surrounds the (EM) KG buildings is considered a visual barrier. The height of this wall is between 200cm and 225cm, which blocks eye contact between the outside and outdoor spaces and the indoor spaces for all building users, especially for young children (Figure 192, 196-198). Therefore, children still feel locked in even while they are playing 'outdoors'.

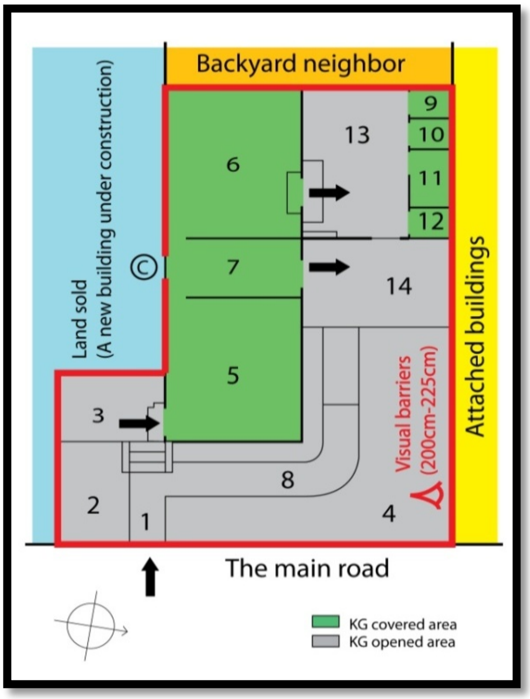



Figure 192: Visual barriers in (EM) KG

#### 6.5.2.5. Function

The plan shows that the KG has multi-levels (Figure 193), which is considered the main obstacle for the building's disabled users, especially for wheelchair users. Those disabled users could be staff, parents or pupils. Whether they are suffering from a permanent or temporary disability as a result of an accident, this is still an important issue to guarantee equal and free access for all people.

However, this problem can easily be addressed at a low cost. This may occur as a result of the following: first, the unique KG design; second, the flat plot that leads to creating a slight difference between the levels of the external surfaces of the building; and finally, because the whole building consists of one ground floor. As a result of all these factors, the maximum height is 80cm and the minimum is 0cm (street level). Therefore, installing some ramps – instead of stairs – could solve this issue. In addition, ramps are safer and easier for ordinary children's use.

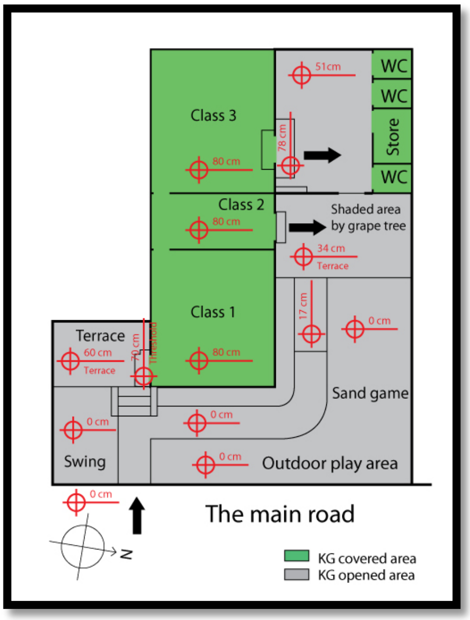



Figure 193: The levels of construction in (EM) KG

## 6.5.4. The general interior view of (EM) KG

### 6.5.4.1. Relationship between building units

The plan shows that all three classes have been located on the same line (Figure 194). In addition, the service areas such as lavatories and kitchen, as in this case, used to be in the far corner of the back yard in order to be as far as possible from the eyes of the curious people and passers-by from the main road. This system has been followed too in the shaded area where the landlord's family members, especially girls and women, used to rest and gather to meet. This shaded area is still being used as an outdoor play area since converting the traditional building into an early educational facility.

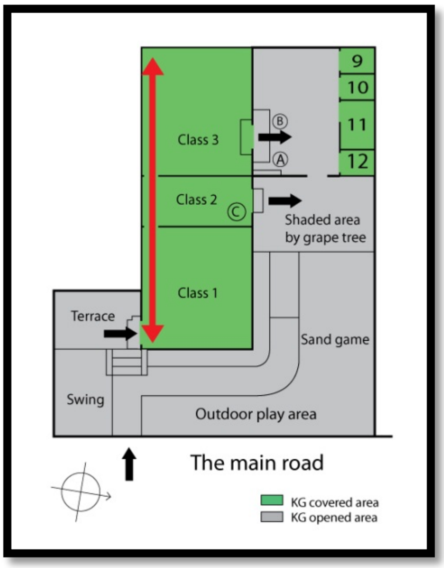



Figure 194: The distribution of classrooms, (EM) KG

According to the KG landlord/director, this style of building has not occurred as a result of a lack of space, because the landlord owned the land on which this building is located. The size of this plot was approximately 2,800 $m^2$, but the present heirs decided to sell the free land (garden) a few years ago. The building was built in the early 1950s and this simple style has been used by ordinary people, who would like to keep the construction costs to the minimum.

### 6.5.4.2. Motion path

This plan shows the flow of movement in this building, which is a connected circular motion (Figure 195). Class No. 2 suffers from three problems:

1. Its limited size (13.75$m^2$) (Figure 200 and 201)
2. Three openings (one door in each side)
3. The movement (tracks) inside this room (Page 323)

The above reasons create many problems related to the form and type of activities that could be practised in this class. It is believed that the room must not be used as a classroom for the previous reasons. Therefore, at the moment, classroom No. 2 is considered an inappropriate classroom (Page 323).

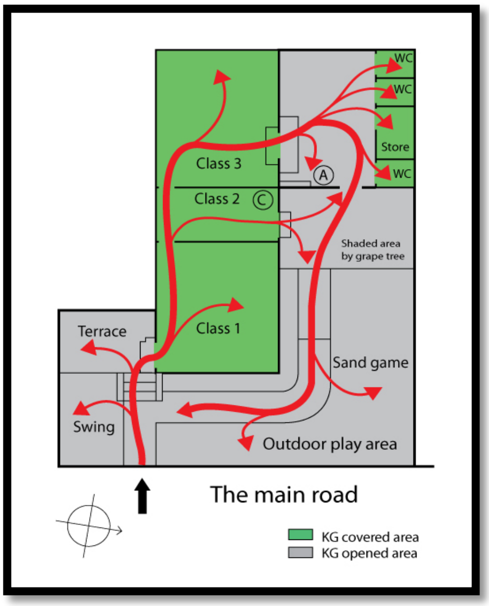



**Figure 195: The figure shows the flow motion of pupils and staff within the (EM) KG facility**

The plan and field inspection of the KG in summer 2011 show the absence of a kitchen, which was there in summer 2009. The kitchen was removed in the last ‘maintenance works’ for the purpose of expanding class No. 3 and also to increase the capacity of the KG.

#### 6.5.4.3. Visual barriers

The second visual barrier in the (EL) KG was the windows, which were installed in a high position (approximately 150cm). This prevents children as well as staff from viewing the surrounding environment. This could have a negative effect on the indoor quality and create an uncomfortable environment (the quality of space will be examined later in this section).

There is only one window that views the outdoor environment from inside the KG (Figure 199 and 196: C). However, this window will be closed by blocks in a few months as a result of selling the north half of the KG plot.

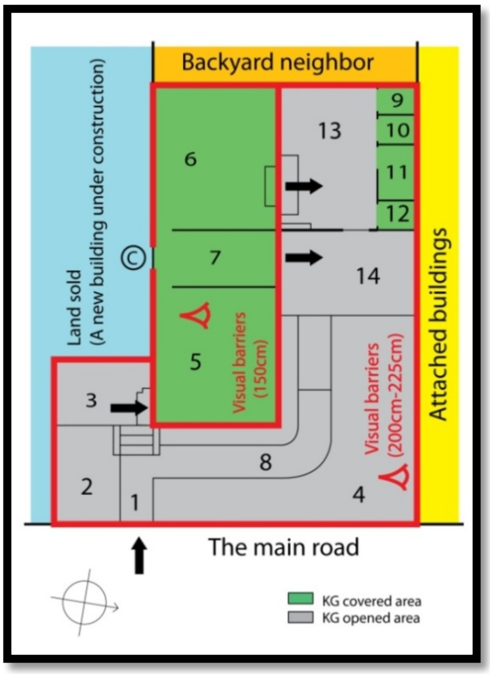



**Figure 196: Two kinds of visual barriers in (EM) KG; high windows (1.5m) and high walls (approx. between 2m and 2.25m)**

The new owner of the land began immediately in building in his share, which will force the (EM) KG to close any window located on the north side (such as window C, Figure 196). This will occur because of the lack of legally defined distance between the edge of the KG building 'roof' and the edge of the land sold. The legal distance between all the building roofs in this area is limited by at least 4 metres from each side, whereas in this case it is zero from the KG side. The KG structure has become located exactly on the edge of the boundaries of the sold land; in other words, because the current KG landlords have sold the entire remaining land up to the edge of the KG building.

**6.5.4.4. Walls**

The lower half of the interior walls has been painted in gloss paint (oil-based) which has a high resistance to stains and is easily cleaned, whereas the upper half has been painted with acrylic paint (water-based) because it is much cheaper (Figure 197). The acrylic paint has another big advantage because of its ability to absorb humidity from the internal air, which reduces the percentage of fungus and bacteria appearing on the wet walls. On the other hand, the oil-based paint will reduce absorbency, which makes the interior walls wet for a longer time. This will lead to the appearance of bacteria and fungus on these wet surfaces if they are not dry within 48 hours.

.

**Figure 197: High windows that cannot enable children to view the outdoors**

In addition, it should be pointed out that there is a concern that the cheap paint should be contained because it contains a proportion of lead, which is harmful to human health; oil paint was made especially for external surfaces, not interior use.

The electric wires are exposed but they have been installed in a high position. Although the roof and walls have been built by modern methods using cement, cement blocks and concrete, there is a traditional pattern in terms of its room distribution. The walls have been covered by illustrations (Figure 198).

#### 7.5.3.5. Windows

The window frames were originally made from wood. These were replaced by steel and aluminium frames when they were damaged. The aluminium frames are the newest ones, whereas the wooden frames are the oldest style (Figure 197-199).

Figure 198: High windows that do not enable children to view and have contact with the outside environment

#### 6.5.4.5. Ceiling

(EM) KG rooms have a high ceiling, approximately 3.6m, which is higher than the current standards of PS modern homes (2.7m for flats and 3m for houses). This may have occurred as an impact of the old building school when the highest point of the PS traditional ceilings was at least 4.5m–5.5m (Hamdan, 1996) (Amiry S. , 2003).

Figure 199: The only window that views the outdoor environment from inside the KG (Figure 80: C)

Figure 200: Photo shows the limited size of class No. 2, which has one window

Hard flooring tiles were installed in all KGs. This type of flooring is too cold in the winter season, especially because children of this age like to play close to the ground and sit directly on the floor (Figure 200).

### Classroom No.2

This room is considered illegal, mainly because it was originally a corridor with a window (Figure 196: C and Figure 200). The size of this classroom is 13.75m$^2$ (5.5mX2.5m), which is occupied by up to 17 children plus their teacher (Figure 211). This 'classroom' has three doors, although it has limited space (Figure 201). In addition, the small classroom is too tall, and its width does not exceed 2.5m.

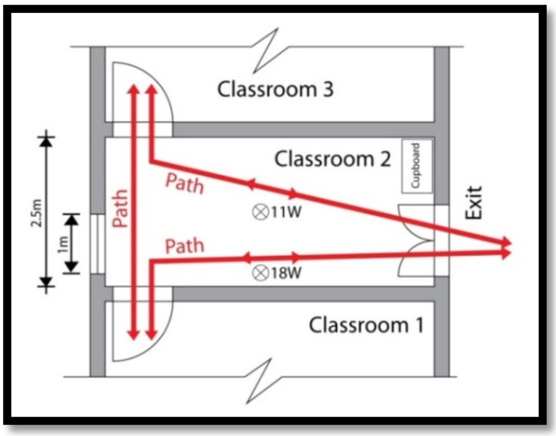



**Figure 201: Paths in classroom No. 2, room No. 7 on the (EM) KG layout**

It is believed that this width is not enough to create a functional classroom, especially as it has three doors, one on each side. This hinders the possibility of the distribution of furniture and children in the form of the functional groups. Thus, this room in its current form is good only for the purpose for which it was erected: as a side entrance/exit or a corridor.

## 6.5.5. Data details: (EM) KG

### 6.5.5.1. The lighting quality: The amount of light

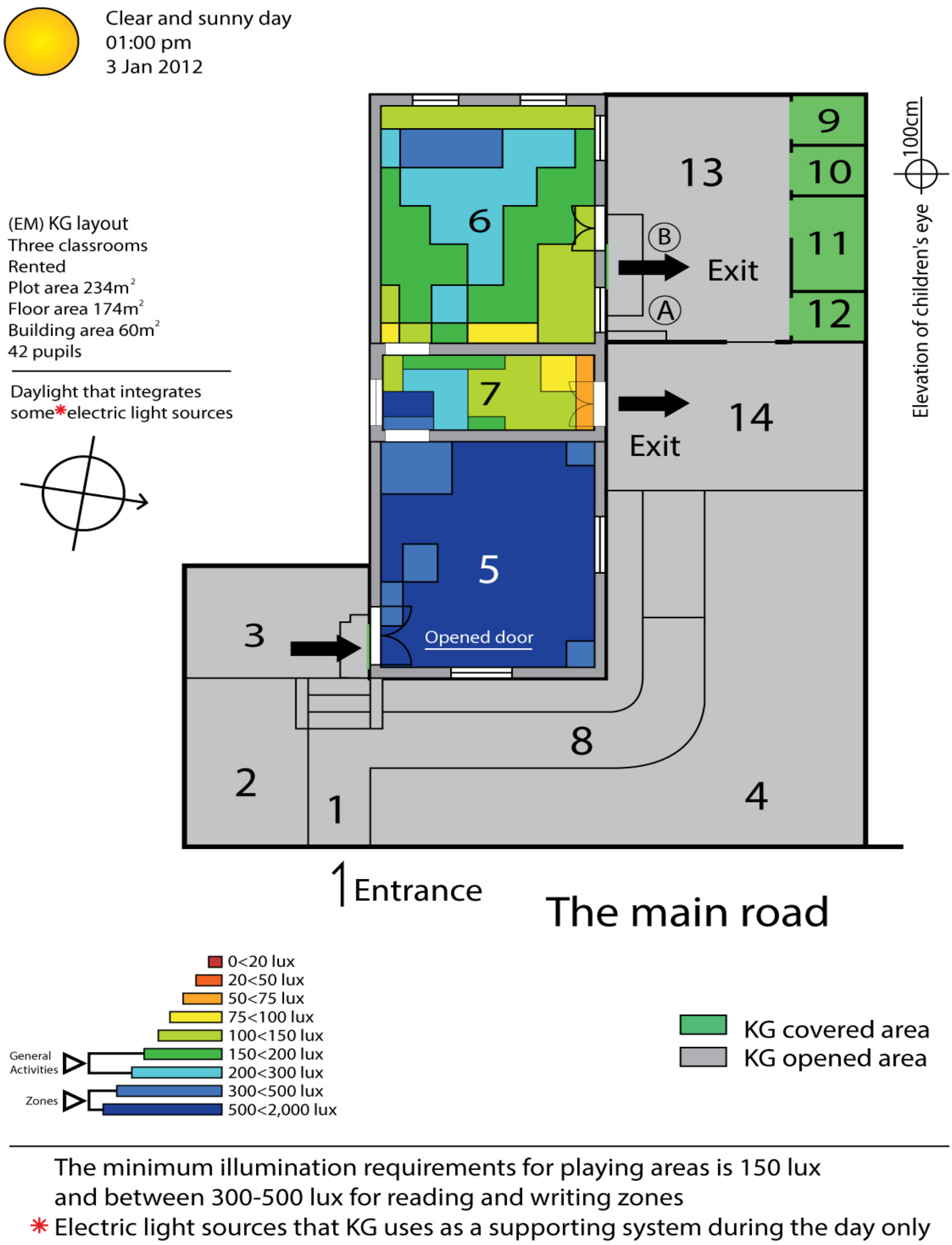



**Figure 202: The amount and distribution of light entering the main classrooms of (EM) KG during a sunny day, 01:00pm on 3 January 2012**

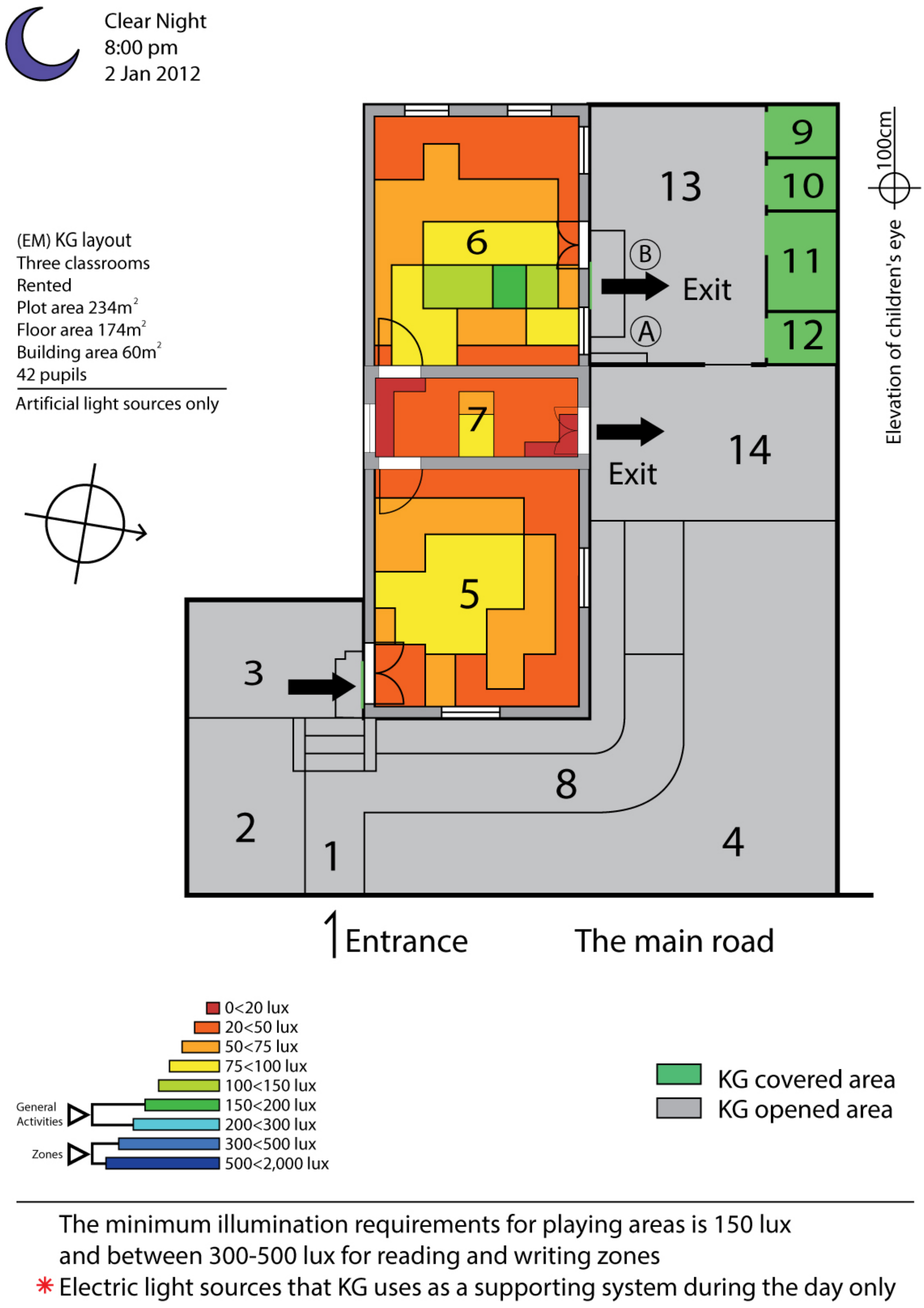



**Figure 203: The amount and distribution of light entering the main classrooms of (EM) KG during a clear night, 08:00pm on 2 January 2012**

**Lighting quality at (EM) KG, Classroom 1/room (NO.5) at the KG layout**

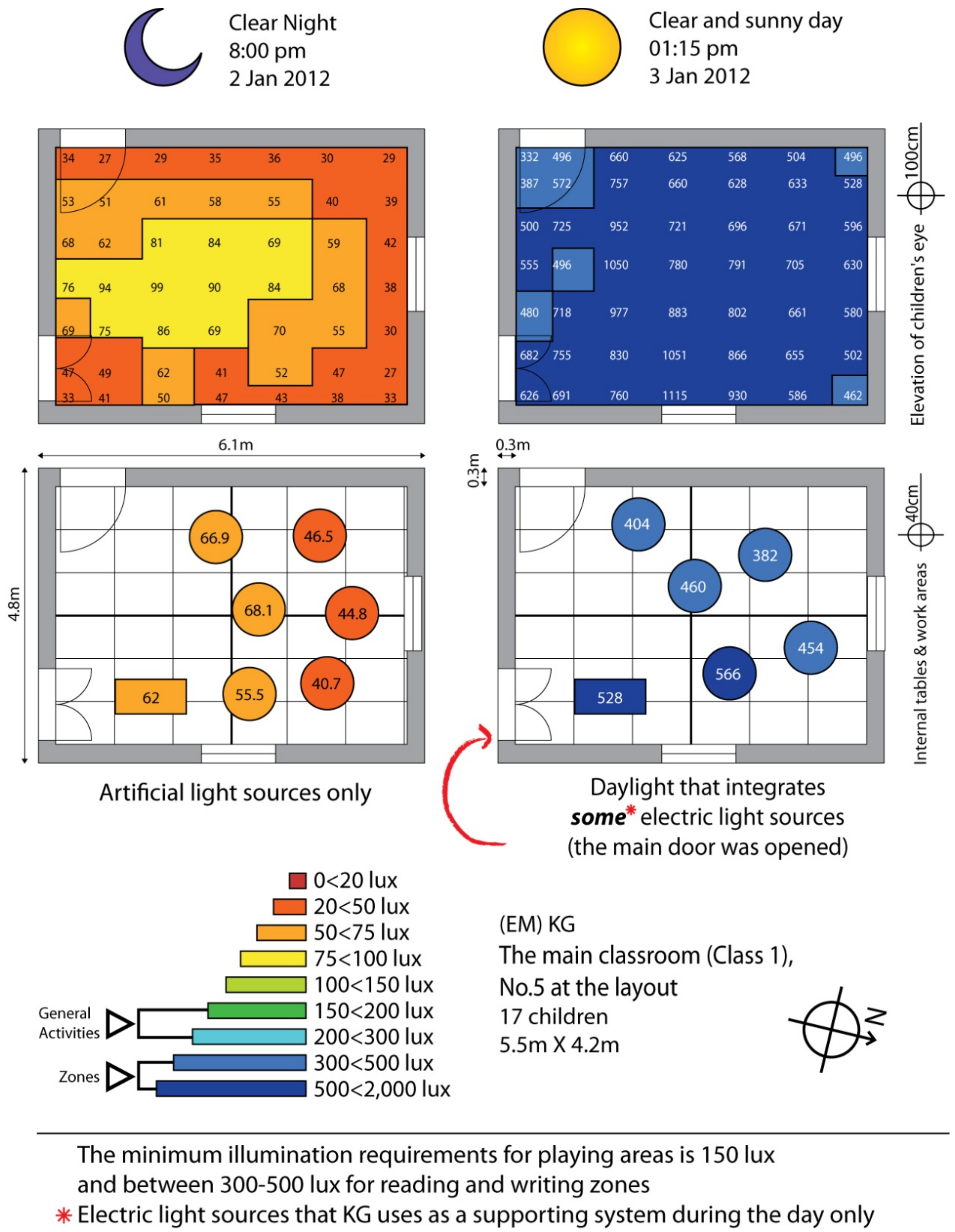



**Figure 204: The amount and distribution of light entering the main classroom (Class 1/ Room 5) at the (EM) KG during a sunny day and a clear night.**

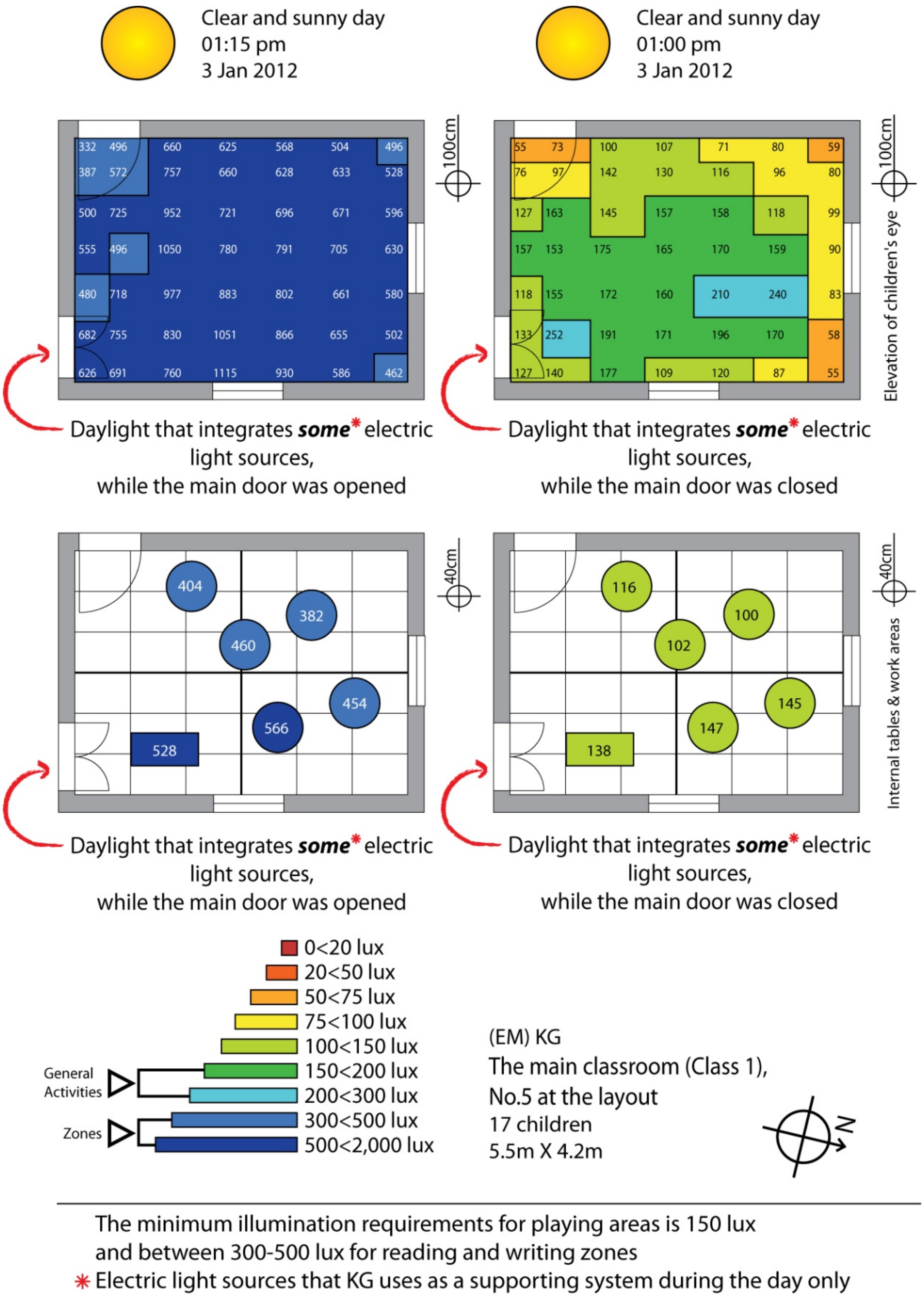
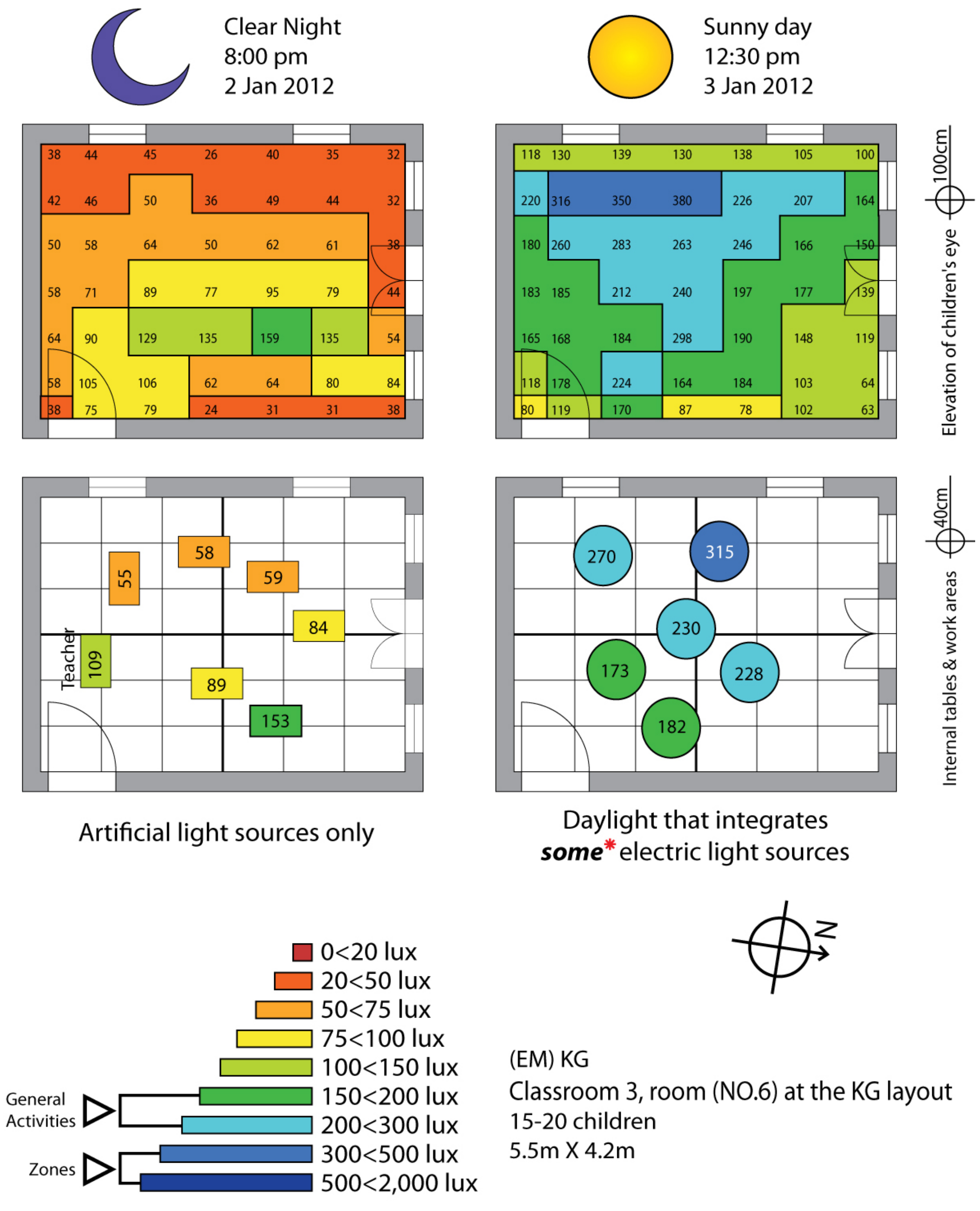



**Figure 205: The impact of opening doors on the amount and the distribution of light inside the main classroom (Class 1/Room 5)**

**Lighting quality at (EM) KG, Classroom 3/room (NO.6) at the KG layout**




The minimum illumination requirements for playing areas is 150 lux and between 300-500 lux for reading and writing zones

* Electric light sources that KG uses as a supporting system during the day only

**Figure 206: The amount and distribution of light entering the secondary classroom (Class 3) at the (EM) KG during a sunny day and a clear night**

**Lighting quality at (EM) KG, Classroom 2/room (NO.7) at the KG layout**

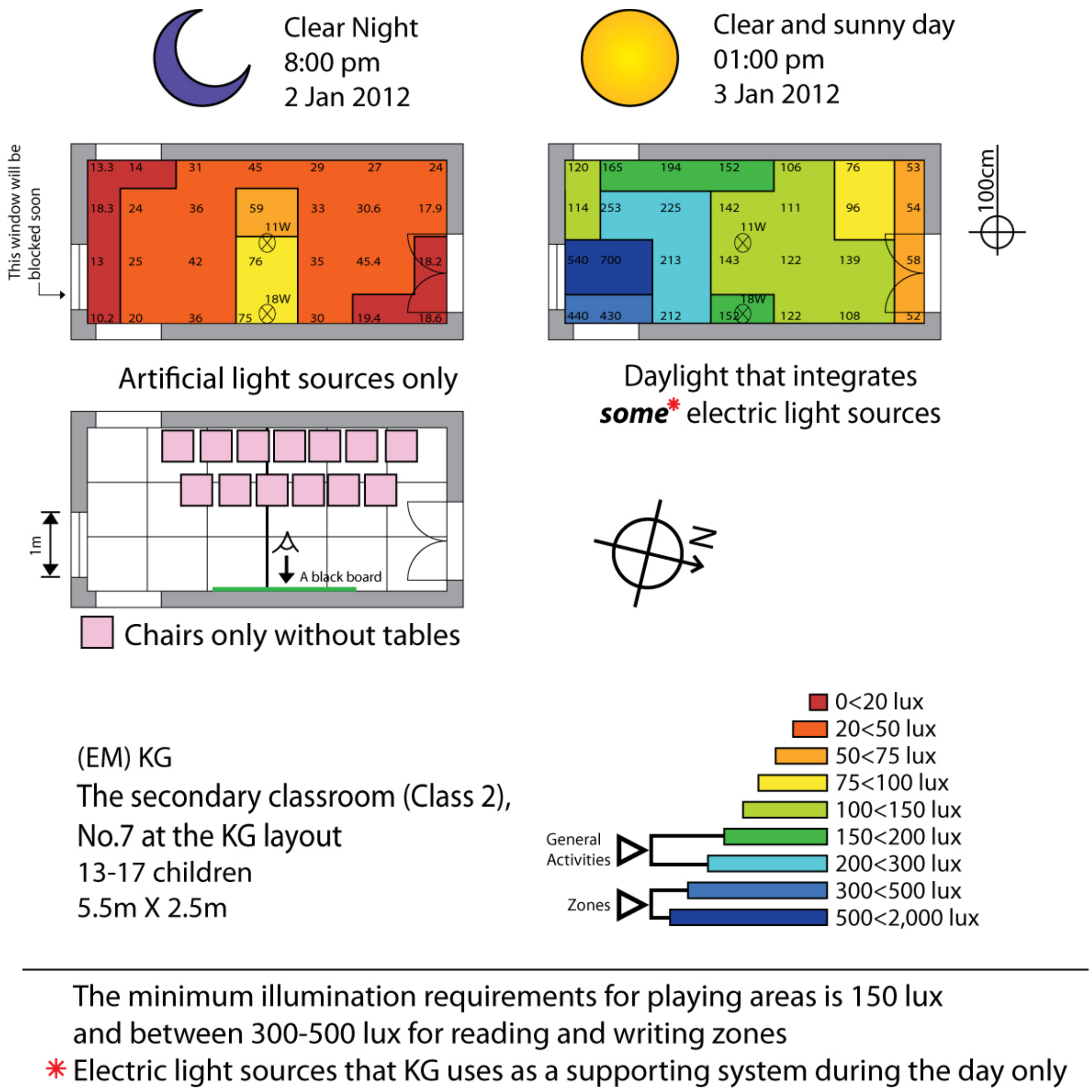



**Figure 207: The amount and distribution of light entering the secondary classroom (Class 2) at the (EM) KG during a sunny day and a clear night**

| | | Analysing the amount and the distribution of light in (EM) KG classrooms | | | | | |
|---|---|---|---|---|---|---|---|
| Time | | Night | | | Day | | |
| Type of tasks occurring within the space | | Visual tasks +40cm | General tasks +100cm | General tasks +40cm | Visual tasks +40cm | General tasks +100cm | General tasks +40cm |
| Min. Standards lux | | >300 | >150 | >150 | >300 | >150 | >150 |
| 1st Classroom | Opened door | 0% | 0% | 0% | 100% | 100% | 100% |
| | Closed door | Not eligible | Not eligible | Not eligible | 0% | 40.81% | 0% |
| 2nd Classroom | | Not eligible[56] | 0% | Not eligible | Not eligible | 42.85% | Not eligible |
| 3rd Classroom | | 0% | 2.04% | 14.28% | 16.66% | 61.22% | 100% |

**Table 28: The percentage of covered spaces that could meet the minimum amount of light for different types of activities (visual tasks and general tasks) within the internal spaces of (EM) KG, December 2011**

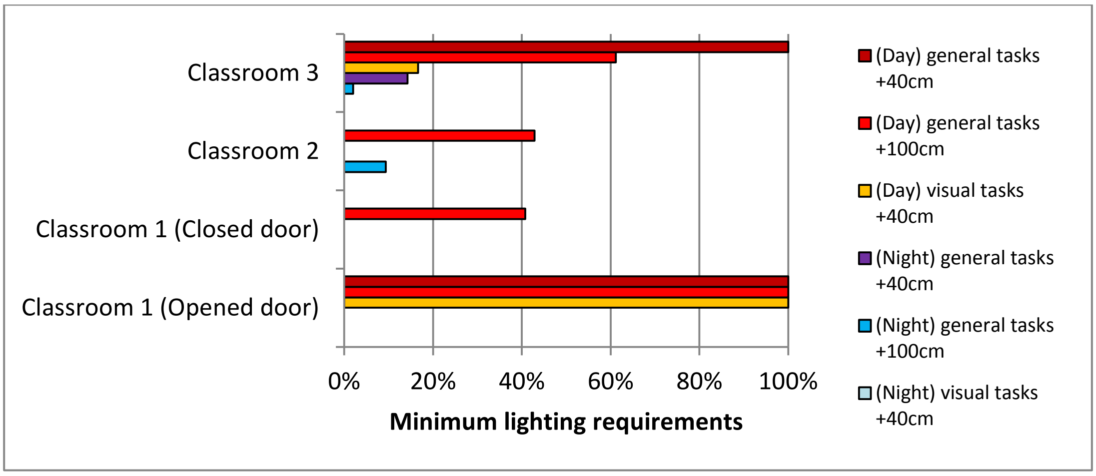



**Figure 208: The percentage of achievements of the minimum lighting required in the (EM) KG, linked to Table 28**

Table 28 shows that the main classroom (class No. 1) met the minimum requirements for the amount of internal light. It reached 100% of the minimum requirements for visual and general tasks during the day and in all interested levels (40cm and 100cm). However, achievement

56 According to (EM) KG there are no visual tasks occurring in classroom No. 2. Thus, there are no tables or working areas in this classroom.

could be reached only while the main door of the classroom, which has direct access to the outdoor environment, was fully open.

Leaving this door open through KGh increases the amount of the light and improves the distribution of the light inside the classroom, which is required for the KG visual and general tasks ‘activities’. This occurs as a result of three factors: the size of the opening, the portrait form of the door, and its location. Increasing the size of the openings in the KG walls via the open door increases the amount of light that enters the room, whereas the portrait form of the door and its location participate in improving the distribution of the light inside the room.

The KG maintains this habit of leaving the main door opened during KGh, as long as the weather allows it. In other words, they have to close it on a rainy, cold or stormy day, which prohibits the KG from the advantages of leaving it open. The disadvantages of closing this metal door can be seen in Table 28. This table shows that although the measurement day was sunny, closing the main door during KGh reduced the amount of light in the main classroom, which is considered the minimum amount for the general tasks, from 100% to 40.81% (+100cm). In addition, it reduced the minimum amount of light required for visual and general tasks from 100% to 0% (Table 28) (Figure 205). It should be pointed out that the current methods and design cannot afford the minimum amount of light in this classroom, which the size and the location of existing windows and supporting lighting system are supposed to deal with.

Moreover, this proves that the proper distribution of openings and their size can alone solve this problem without relying on lighting support systems, which consume energy and cost money to install and run. The current KG must use the upper limit of free energy provided by the sun; this does not require a high  technique and budget to install and run, especially for modern and new facilities built in the future as a KG.

For instance, installing a glass door with an aluminium/fibreglass frame instead of the current solid metal door could have a great impact on improving the amount and the distribution of light inside such a room. Such a door not only can be used in all seasons, but also is more durable (would not rust), and energy efficient because it has a solid foam core and a double pane of insulated tempered glass, which has more insulation (Figure 209).

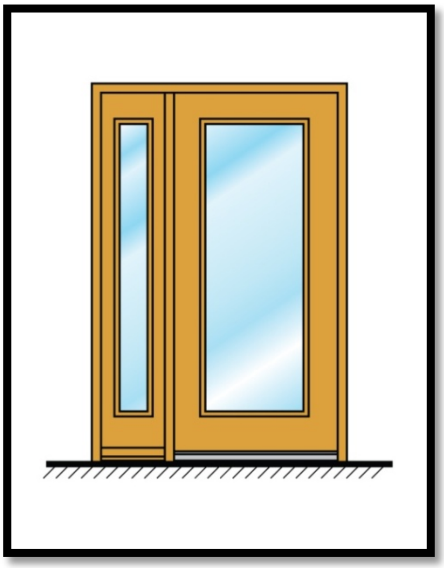


**Figure 209: Fiberglass door with semi-transparent glass**

A cheaper way to achieve the same aim could be by redesigning the current metal door by installing two glass/fibreglass windows in its body.

In (EM) KG, the minimum amount of light suitable for general tasks covered 42.85% of the space in the second classroom during a sunny day (3 June 2012), whereas it covered 0% of the internal spaces at night (2 June 2012) (Table 28).

According to (EM) KG's landlord, no visual activities occur in classroom No.2 as a result of its limited space, which prevents them from installing tables and working areas to support such activities. Therefore, they focus only on general activities in this room, such as developing children's communication skills. This factor leads to excluding studying the amount and the distribution of light that is required for visual tasks, since in this room no such tasks occur on this level because of the complete absence of any tables and working spaces at this height (+40cm). The teacher, who would be responsible for this class, can depend on only a blackboard fitted on the wall for clarification (Figure 211 and 2011).

Regarding classroom No. 3, the experiment shows that 16.66% of its working areas and zones (table tops) could reach the minimum required amount of light for visual tasks, whereas

61.22% of its internal spaces are suitable for general tasks during the KGh. However, depending on artificial light alone, these numbers have fallen to reach 0% and 2.04% at night for visual tasks (+40cm) and general tasks (+100cm) respectively. Moreover, only 14.28% of the working area could be used for general tasks at that level during the night or with the complete absence of daylight in the winter during the normal KGh (Table 28).

This important point indicates the limited participation that the current supporting system can provide, and also its limited role in filling the shortage which may occur in the amount of daylight as a result of the current building design or as result of the weather.

The type and the percentage of activities during (EM) KGh

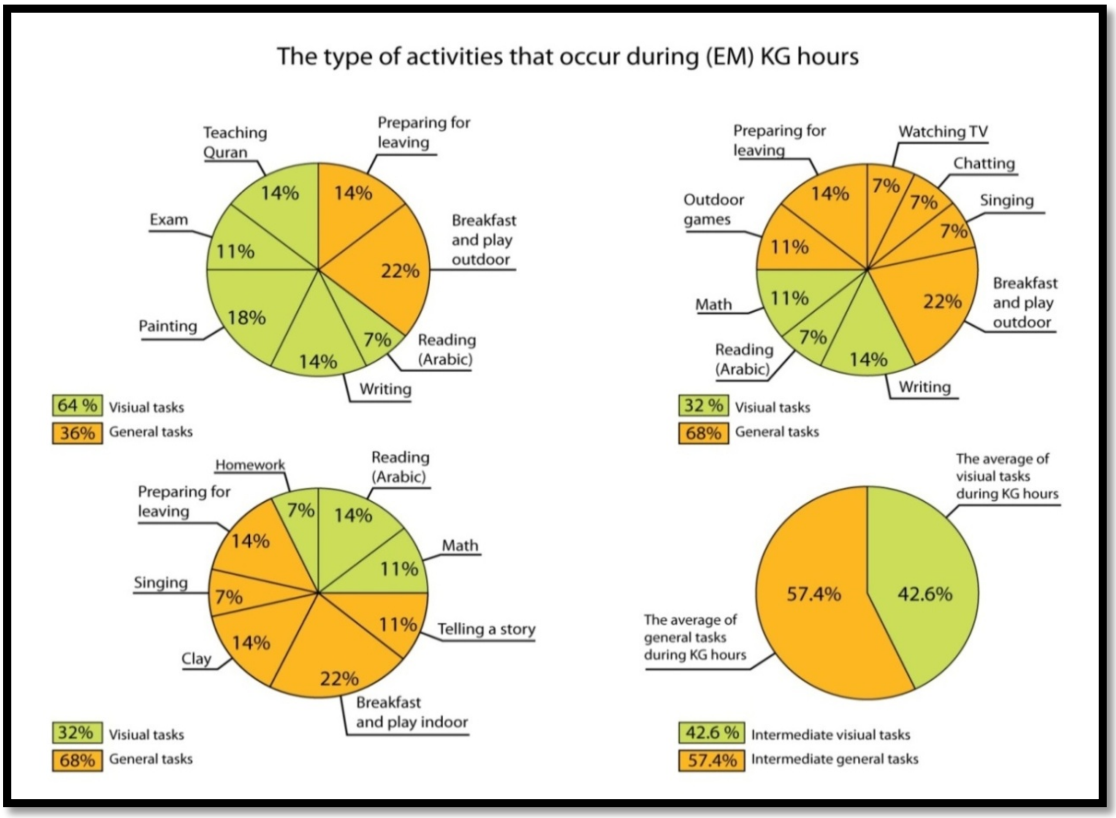



**Figure 210: the percentage of visual and general tasks during KGh at (EM) KG. These are linked to Table 27. The same program has been followed for the all classrooms.**

The pie charts in page 333 (Figure 210) show the types of activities (visual or general tasks), which occurred in KGh in (EM) KG in the period between 28 December 2011 and 2 Jan 2012. It points out that 57.4% of activities could be considered general tasks, whereas 42.6% of the activities were visual tasks. Each kind of task had special requirements for the amount of light. When these figures are compared with the provided spaces that received the minimum required amount of light, a gap appears (Table 28).

For instance, when the main door of classroom No. 1 was closed (Figure 204 and 205), which is supposed to be the 'normal' situation in all KGs, the percentage of suitable space for visual tasks was zero and the percentage of these activities is equal to 42.6% of KGh (Table 28). In addition, while the percentage of appropriate spaces for general tasks covered 40.81% of classroom No. 1, the percentage of this kind of activity occupied 57.4% of KGh. Furthermore, the same situation occurred in classroom No. 2 (Figure 211), when the percentage of its appropriate spaces for general tasks was only 42.85%.

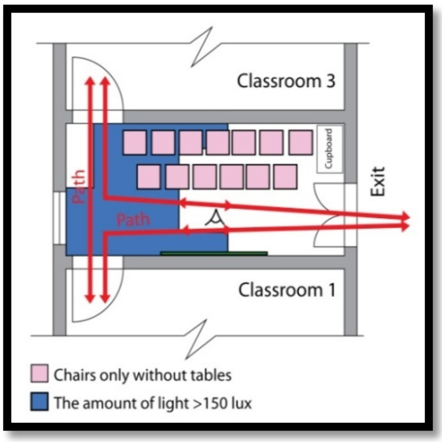



**Figure 211: The ineffectiveness of provided light in classroom No.2 because of the paths, furniture and light distribution inside this room**

The only exception was in what the (EM) KG called 'classroom No. 2', which does not have working areas and required visual tasks because of its space limit. 61.22% of the classroom space receives the minimum amount of light for general tasks, while the percentage of this kind of activity was 57.4%.

However, it should be pointed out that there is a problem in the distribution of light in this room as a result of it having been located on non-interest areas (Figure 211).

From the previous results (Table 28) linked to pupil's life-cycle at (EM) KG (Table 27) and the type of activities that occur in these rooms (Figure 210), the following points can be concluded:

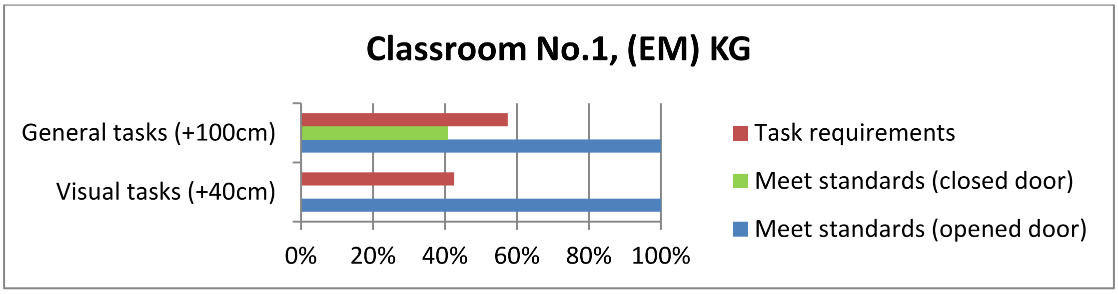



**Figure 212: A comparison between the needs of classroom No. 1 (in terms of the amount of light for each kind of activity) and the amount of provided light inside this room and in both cases, while the main door was closed and opened.**

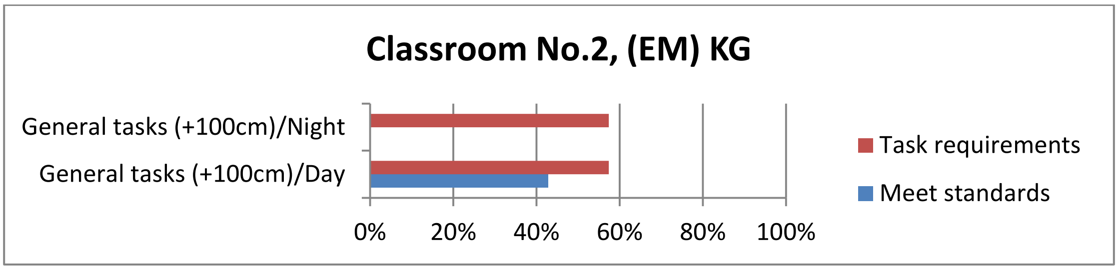



**Figure 213: A comparison between the needs of classroom No. 2 (in terms of the amount of light for each kind of activity) and the amount of provided light inside this room.**

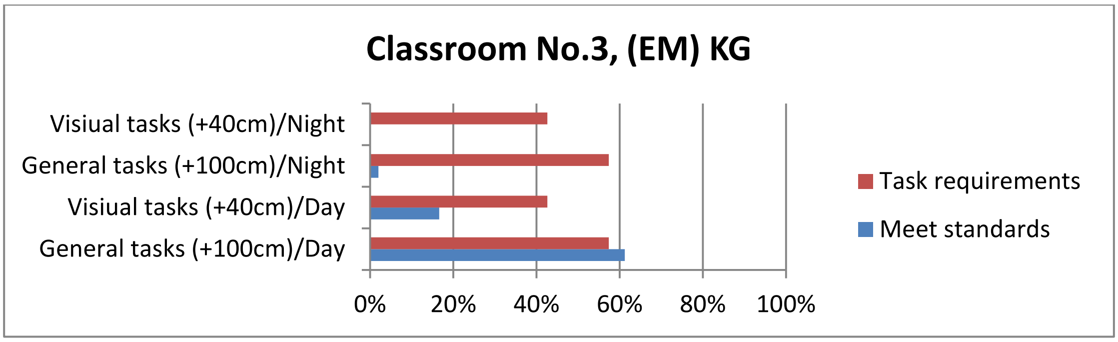



**Figure 214: A comparison between the needs of classroom No. 3 (in terms of the amount of light for each kind of activity) and the amount of provided light inside this room.**

First, although the average of the general tasks that occurred during (EM) KGh was 57.4% (Figure 210), the average space that could meet the minimum amount of light requirements for such kinds of activities was approximately 48.29%. In addition, the average of visual tasks that occurred through (EM) KGh (42%) does not fit the available amount of light that could be provided in (EM) KGh (Table 28) even with using some lighting support system in this facility (Figure 204 and 205) [57].

This means that the amount of lighting and how it is distributed in these rooms does not fit the current needs of (EM) KG.

#### 6.5.5.2. $CO_2$ rate of (EM) KG

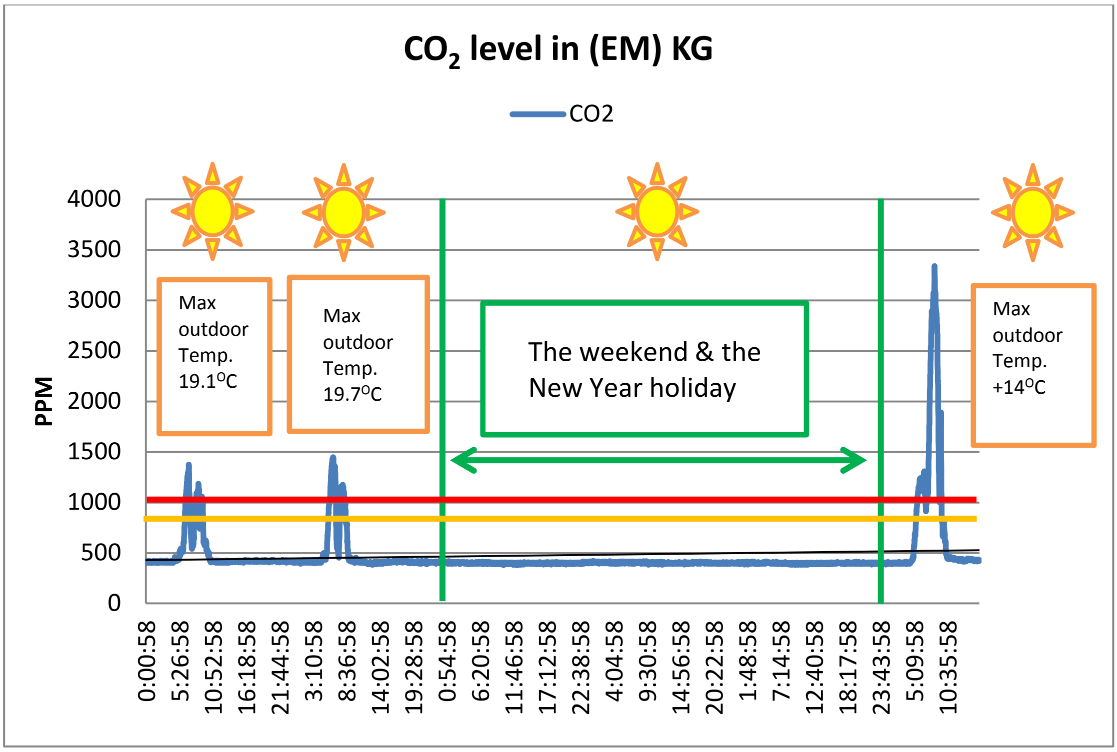



**Figure 215: The $CO_2$ level in (EM) KG on 28, 29 December 2011 and 2 Jan 2012 (GMT +2) in Jerusalem**

[57] While the main door of classroom No. 1 was closed

The previous chart shows that the concentration of $CO_2$ was over the accepted limits during the (EM) KGh on all experiment days. The most dangerous situation was when the concentration of $CO_2$ reached a peak of 3,340ppm at 10:30am[58] on 2 Jan 2012 (Figure 218), whereas it reached 1,375ppm at 09:00am on 28 December 2012 and 1,440ppm at 09:00am on 29 December 2009 (local time).

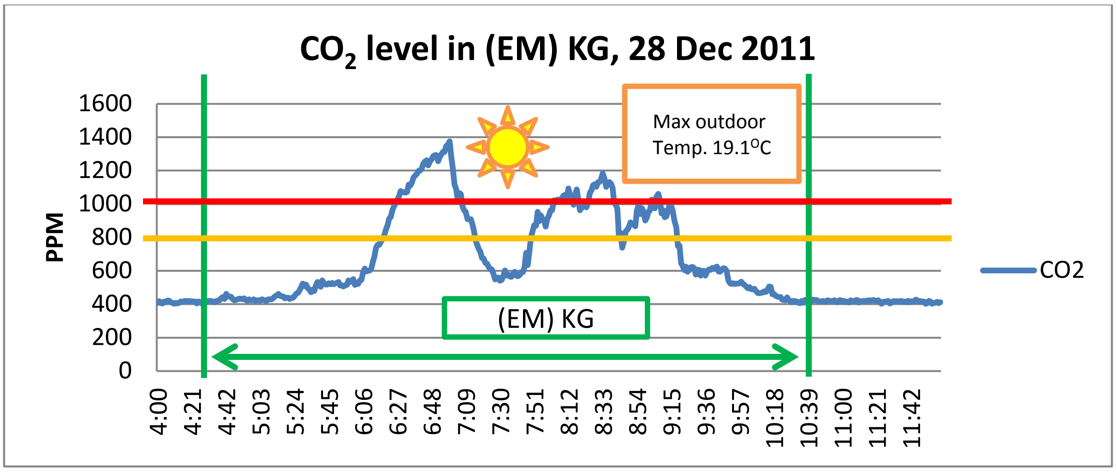



**Figure 216: The $CO_2$ level in (EM) KG during on 28 Dec 2011 (GMT +2) in Jerusalem**

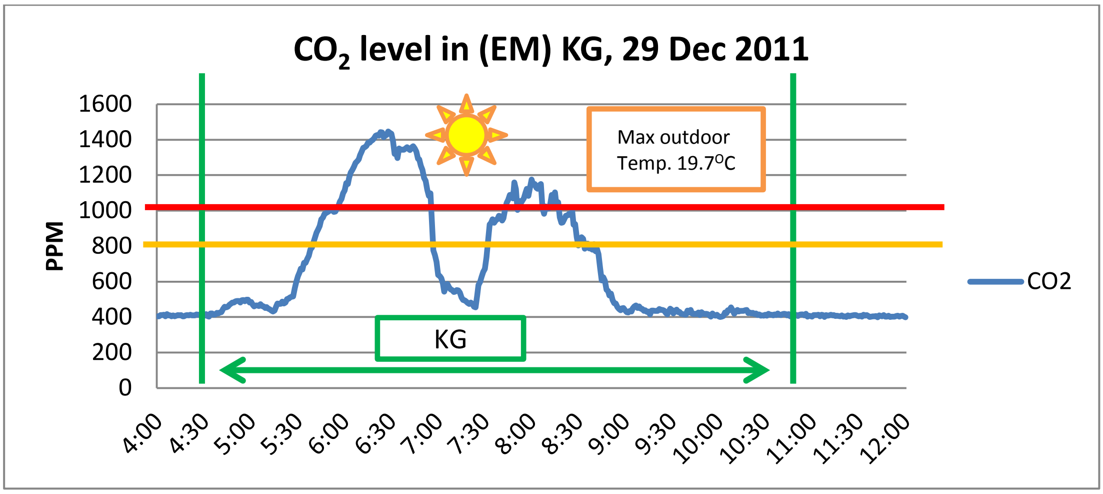



**Figure 217: The $CO_2$ level in (EM) KG during on 29 Dec 2011 (GMT +2) in Jerusalem**

[58] Local time(Jerusalem) GMT +2

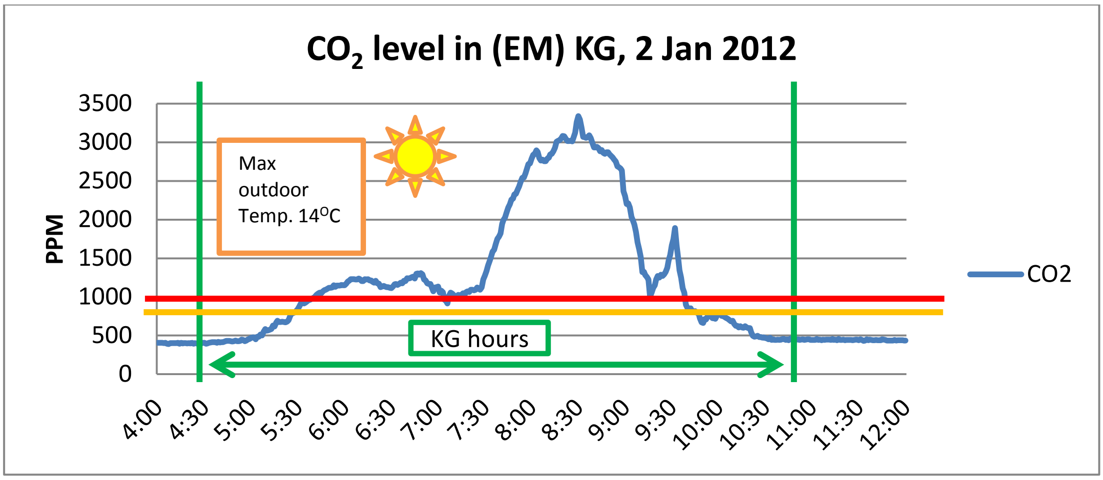



Figure 218: The $CO_2$ level in (EM) KG during on 2 Jan 2012 (GMT +2) in Jerusalem

#### 6.5.5.3. The outdoor temperature and humidity rate of (EM) KG

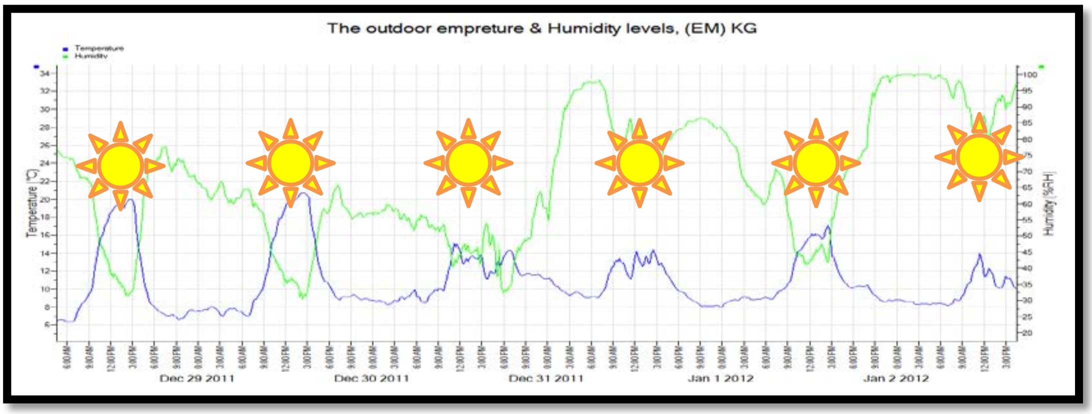



Figure 219: The outdoor temperature and humidity rate of (EM) KG, between 28 Dec 2011 and 2 Jan 2012

The above figure shows that the weather was sunny and clear during the measurement days in (EM) KG. The outdoor temperature was between approximately +6$^{O}$C to +20$^{O}$C during the same period.

#### 6.5.5.4. The indoor temperature and humidity rate of (EM) KG

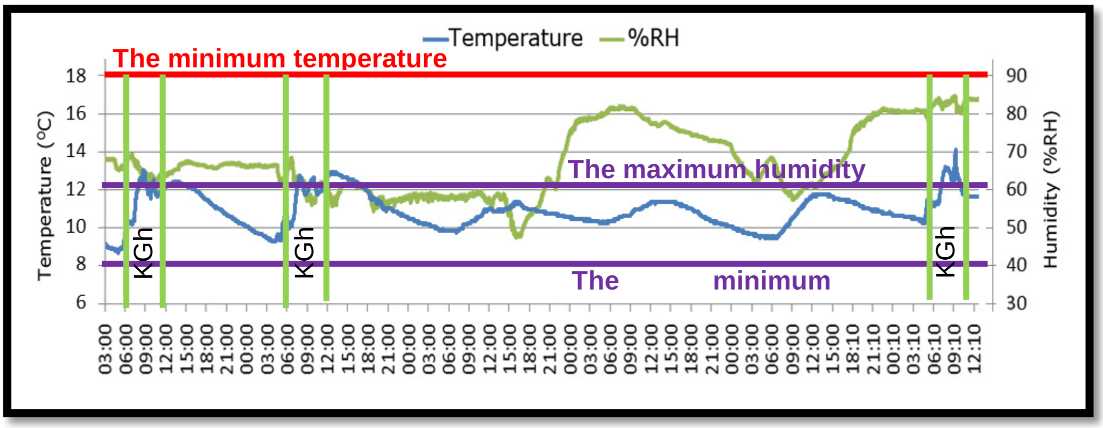



Figure 220: The internal temperature and humidity levels of the class 1 at (EM) KG between 28 Dec 2011 and 2 Jan 2012

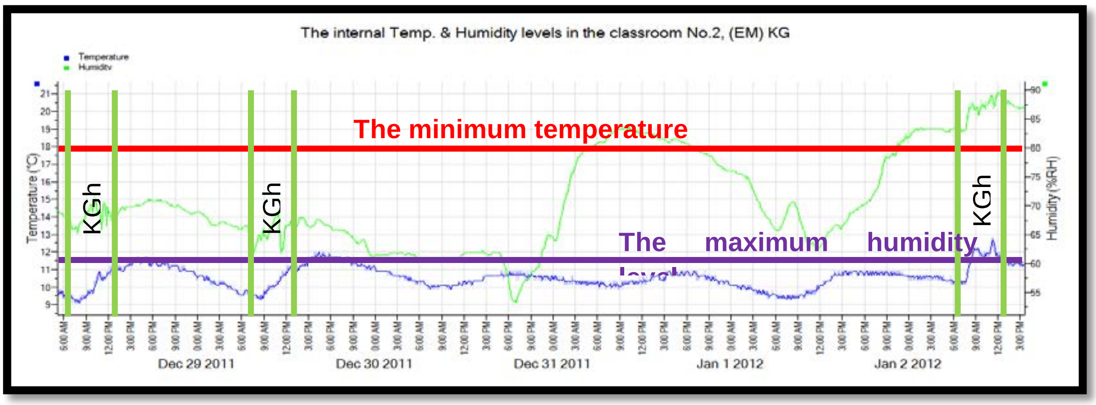



Figure 221: The internal temperature and humidity levels of the class 2 at (EM) KG between 28 Dec 2011 and 2 Jan 2012

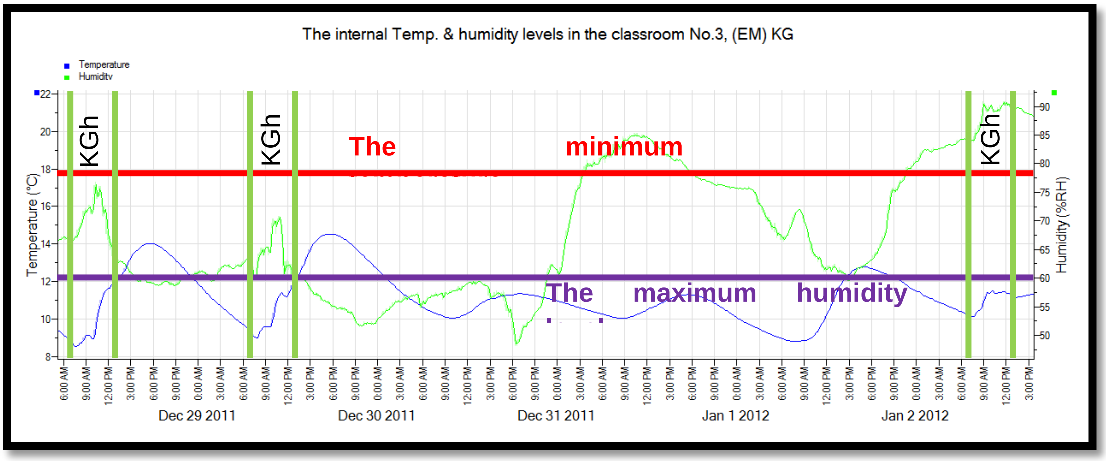



**Figure 222: The internal temperature and humidity levels of the class 3 at (EM) KG between 28 Dec 2011 and 2 Jan 2012**

The indoor temperature was below the minimum standards (18$^{O}$C) for the entire experiment days between 28 December and 2 Jan 2012. The difference was as follows: between 3.9 $^{O}$C and 8$^{O}$C on 28 December, between 5$^{O}$C and 9$^{O}$C on 29 December 2011 and between 6$^{O}$C and 9.6$^{O}$C on 2 Jan 2012 in class 3 during (EM) KGh (Figure 220-222)..

| **Analysing the relationship between $CO_2$ and both outdoor temperature and humidity** | | | | | | |
|---|---|---|---|---|---|---|
| Date | 28 Dec 2011 (Sunny) | | 29 Dec 2011 (Sunny) | | 2 Jan 2012 (Sunny) | |
| | Outdoor Temperature ($^{O}$C) during KGh | Outdoor Humidity (%RH) during KGh | Outdoor Temperature ($^{O}$C) during KGh | Outdoor Humidity (%RH) during KGh | Outdoor Temperature ($^{O}$C) during KGh | Outdoor Humidity (%RH) during KGh |
| | Max/Min/Average | Max/Min/Average | Max/Min/Average | Max/Min/Average | Max/Min/Average | Max/Min/Average |
| | 19.1/6.4/12 | 73.9/36.5/57.5 | 19.7/7/12.9 | 64.7/35.7/50.2 | 14/8.17/10.2 | 98.6/75.6/90.1 |
| | Over the recommended $CO_2$ limit (800ppm) | **Over the maximum $CO_2$ limit (1,000ppm)** | Over the recommended $CO_2$ limit (800ppm) | **Over the maximum $CO_2$ limit (1,000ppm)** | Over the recommended $CO_2$ limit (800ppm) | **Over the maximum $CO_2$ limit (1,000ppm)** |
| | 8:19am-9:14am | 8:26am-9:06am | 7:40am-8:57am | 7:47am-8:55am | 7:29am-11:45am | 7:41am-9:04am |
| | 9:49am-10:44am | 9:03am-9:14am | 9:32am-10:37am | 9:43am-10:07am | | 9:07am-9:11am |
| | 10:47am-11:18am | 9:14am-9:18am | | 10:09am-10:17am | | 9:12am-11:39am |
| | | 9:21am-9:41am | | | | |
| | | 11:03am-11:04am | | | | |
| | | 11:06am-11:08am | | | | |
| Overall | 2:21h | 1:16h | 2:22h | 1:40h | 4:16h | 3:54h |
| % of KGh | 39.16% | 21.11% | 39.44% | 27.77% | 71.11% | 65.55% |

**Table 29: Linking the concentration of $CO_2$ in (EM) KG (Figure 215); the outdoor temperature and humidity rate of (EM) KG; and pupil's life-cycle of (EM) KG (Figure 219 and Table 27). Local time**

Table 29 shows that the concentration of $CO_2$ was over the recommended limits during all experiment days between 28 December 2011 and 2 Jan 2012. In addition, it illustrates the impact of the outdoor temperature on the concentration of $CO_2$ inside the classrooms' air.

On 28 and 29 December 2011, 21.11% and 22.77% of KGh were over 1,000ppm when the maximum outdoor temperature was 19.1$^{O}$C and 19.7 $^{O}$C respectively, whereas 65% of (EM) KGh was over the maximum limit (1,000ppm) when the maximum outdoor temperature decreased to +14$^{O}$C (Table 29).

By linking the previous results with the pupils' life-cycle (Table 27) it may be noted that when the outdoor temperature dropped four degrees this led to:

- forcing (EM) KG to keep their children as much as possible inside the classrooms
- the reluctance of a large number of children to play outside and preference for playing inside the building.
- keeping the main door closed as much as possible during the season.

All of the above factors led to a rise in the amount of $CO_2$ in classroom air during KGh during this short period of time, although the weather was sunny on all days and the average outdoor temperature on 2 Jan 2012 was only 10.2$^{O}$C during KGh (Table 29). Furthermore, this demonstrates the relationship between the indoor humidity and previous factors for the same reasons.

#### 6.5.5.5. Extra problems related to the (EM) KG management

Although it has just passed the investigator check because of asking to add an extra classroom to increase its capacity, (Jun 2011 and December 2012), the following problems remain:

- No heating system nor any heating methods have been installed in this facility
- No fire alarm system has been installed in the KG
- There is no first aid-kit (empty box)
- Expired fire extinguisher (Summer 2011)
- Lavatory kit such as a ceramic sink does not fit to children's scales and it is installed in too a high position for children's use (Figure 224)
- Unprotected and uncovered water pumps, which are easily accessible by children, increasing the hazards of electric shocks, and the movement parts of the water pumps could be very dangerous on children's fingers if they try to touch them (Figure 225)
- The concrete layer in the outdoor play area is uneven and has some potholes, which increase the risk of falling on solid ground (Figure 227)
- The lack of maintenance works (Figure 223, 227, 229 and 230)
- Inappropriate plants in outdoor play area because of the high risk of suffocation and because of the sharp thorns that these plants have (Figure 228)
- Broken doors with sharp edges (Figure 226).

**Figure 224: Unsuitable sink for children's scale and use with high point installation**

**Figure 223: Unusable tap water for drinking**

**Figure 225: Uncovered water pump in the outdoor play area, that is reachable by children**

**Figure 226: Broken door lock in toilet, with danger of sharp edges**


**Figure 227: Uneven ground, the risk of falling on solid ground**

**Figure 228: Plants with thorns Bougainvillea and Rose in the play area next to the main entrance**

**Figure 229: Dirty walls that need maintenance**

### 6.5.6. Summary

**Figure 230: Swing-seat has dangerous sharp edges, and rotten fruits have fallen on seats**

The results of the (EM) KG case study and analysis of its outcomes show that the current PS regulations could not guarantee, in this case, the quality of learning environment that is related to the quality of space. Between 28 December 2011 and 2 Jan 2012 no (EM) KG classrooms could achieve the minimum indoor temperature standards during the entire KGh, when the average outdoor temperature during KGh was 12.04$^{O}$C on sunny days. In addition, for 48.148% of the time (390/810min), which children spent inside the main classroom for KG activities, children were suffering from a high concentration of $CO_2$ that reached 3,340ppm. Furthermore, the concentration of $CO_2$ was over the recommended limit (800ppm) for 61.728% of the time (390/810min) that children spend inside the classrooms. The difference between indoor and outdoor temperature was so narrow because their figures were very close, which may give an idea about the quality of thermal insulation, especially with the absence of heating systems. These figures can be important when compared with the outcomes of the first case study that focuses on KGs converted from PS traditional buildings, such as (EL) KG. This may reflect the advantage of traditional thick walls, 'Aqid' domes, traditional patterns and distributions or even the advantage of using natural materials in the main construction of this type of converted KGs. Regarding relative humidity, although the whole measurement period was during sunny days and clear nights, the average of relative humidity was approximately 14% over the maximum limits during KGh.

It should be pointed out that all previous figures from the second case study could easily be worse, when the outdoor temperature reaches freezing point during February in this region, or on rainy days.

### 6.5.6.1. Unapplied regulations

The (EM) KG bypasses the current PS regulations (2010) on many points, by ignoring the items below, which are:

| Item No. | General regulations | |
|---|---|---|
| 4. | Each activity must not exceed 30 minutes (Table 27). | X |
| 5. | There is no homework (Table 27). | X |
| 6. | There are no exams or marks, but there is feedback for assessment (Table 27). | X |
| | **A) Indoor** | |
| 4. | The building should be well-lit, have good ventilation and appropriate lavatories that meet the engineering and health requirements (Table 28). | X |
| 7. | The corridor is not allowed to be used as a classroom (Page 323). | X |
| 8. | The KG building should have a proper kitchen (there is no kitchen in this facility) | X |
| 10. | The lavatory should fit to a child's scale (Figure 224) | X |
| 11. | There should be proper water outlets for drinking that are fit for a child's scale and should be installed far away from lavatories (Figure 223). | X |
| | B) Outdoor | |
| 5. | It is prohibited to install a manhole in the outdoor play area. | X |
| | The KG furniture and equipment | |
| 4. | A cupboard without handles for each child to store her/his personal belongings; in addition, each cupboard must have a hanger for their coats (NOT available). | X |
| 6. | Part of the multi-activity room should be covered by carpet (NOT available). | X |
| 7. | Administration office and library should be furnished (there is no administration office or corner). | X |
| 8. | The kitchen should have the necessary appliances, cupboards and tap water (no kitchen). | X |
| | The outdoor toys in KGs | |
| 2. | The outdoor toys should be secure and safe (Figure 191 and 230). | X |
| 3. | They should be made of fiberglass and meet the safety requirements, taking into account keeping at least 3m between one game and another (NOT available). | X |
| 4. | Three-wheel bicycle, small trolleys for children's use and other suitable toys (NOT available). | X |
| 6. | Gardening tools that are appropriate for children (NOT available). | X |

contd.…/

| | Methods of protection and safety in KGs | |
|---|---|---|
| 1. | Each KG must have fire extinguishers (expired). | X |
| 2. | Each KG must have a first-aid kit that has a collection of all necessary supplies and equipment for use in giving first aid (empty first-aid box). | X |
| 4. | KGs should be free of obstacles such as barbed wire and stairs (Figure 193). | X |
| 9. | All sorts of stairs should have a handrail, regardless of the number of these stairs (NOT available). | X |
| 10. | The main entrances must have barriers in front of them for protection (NOT available). | X |
| 11. | Each KG should have more than one entrance to be used as an emergency exit (NOT available). | X |

**Table 30: Table shows the missing items that (EM) KG could not meet in terms of the current PS regulations, 2011**

#### 6.5.6.2. Advantages and disadvantages of the (EM) KG

A) Advantages

1. It has some features of PS traditional houses, especially in terms of building pattern[59] and distribution
2. The maintenance of this type of house is much cheaper than building new KG facilities and requires less maintenance work than PS traditional houses, such as the (EL) KG
3. Because its walls were built from cement blocks, it is easier to modify/change its distributions and it is also easier and cheaper to install and maintain its electric system than in PS traditional buildings
4. Its location in the heart of the urban area
5. The outdoor and indoor spaces are easy and inexpensive to develop to serve the wheelchair user
6. It has wider and more windows than the old typical PS traditional houses built before the 1940s
7. Detached building

[59] Uses white lime stones for cladding the outer face of the external walls and still follows and uses the same traditional dimensions, such as the dimensions of lime stones and floor tiles

B) Disadvantages

1. The relationship between the indoor spaces and the outdoor spaces is missed
2. The relationship between the outdoor spaces and the outdoor environment is missed
3. Inappropriate for wheelchair users
4. No heating systems
5. No fire alarm system
6. No kitchen
7. Unsafe outdoor toys
8. Concern about the quality of lighting
9. High humidity and $CO_2$ levels during KGh
10. Low indoor temperature as a result of the absence of any heating system
11. Thin walls[60] and low insulation materials
12. Does not respect children's scales[61]

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[60] Compared to the PS traditional walls
[61] This is related to the lavatories kit, stairs dimensions, openings mechanism and their height installations, door safety requirements for children's use

## 6.6. THE THIRD CASE STUDY: (MY) KG

### 6.6.1. The importance of the KG as a case study

Its importance lies in its representation of modern buildings[62] because it is converted from a modern building that was built in the 1990s. This building, in contrast to the first two case studies, has a modern design distribution. Thus, the relation between its spaces is different because it belongs to the modern 'building school' in PS (see Table 31).

| First case study (EL) KG | Second case study (EM) KG | Third case study (MY) KG |
|---|---|---|
| Converted to a KG from three traditional buildings | Converted to a KG from a modern building that still has some traditional features | Converted from a modern building |
| Originally built between the 1920s and 1940s | Originally built in the early 1950s | Originally built in the early 1990s |
| From the 'old school' of building in PS | From the 'middle-era' between two schools in the PS building | From the 'modern school' of building in PS |
| Traditional internal distribution | Traditional internal distribution | Modern internal distribution |
| Built from traditional materials | Built from mixed materials | Built from modern materials |
| High ceiling above 4.5m | High ceiling between 4m and 4.5m | High ceiling between 2.8m and 3.2m |
| High windows | High windows | Lower windows |
| Small openings | Small openings | Wide openings |
| The thickness of the walls is between 80cm and 140cm | The thickness of the walls 30cm | The thickness of the walls is between 15cm and 30cm |
| 47 children (2011/2012) | 60 children (2011/2012) | 129 children (2011/2012) |
| 3 active classrooms | 3 active classrooms | 4 active classrooms + multipurpose classroom |
| The size of the building is considered small | The size of the building is considered small/medium | The size of the building is considered large |
| The size of the external spaces is considered small | The size of the external spaces is considered medium | The size of the external spaces is considered large |
| Located in Nablus Province (The West Bank-PS) | | |
| Fully licensed | | |
| High reputation | | |
| Same tuition fees | | |
| Same curriculum | | |
| Does not have heating systems | | |
| None of them was originally built as KG facilities (converted houses) | | |

Table 31: Comparison between the three case studies

[62] Modern pattern and materials structures (see Table 31)

Although white stone (lime stone) was used in cladding the exterior walls like the (EM) KG building and it looks very similar to (EL) KG, all other structural elements and features could be unique. For instance: the openings, especially windows, are very wide compared to the first two cases; the height of the ceiling is much lower than in the first two studies; the sizes of internal and external spaces are much bigger. In addition, this case study is important because the number of its children enrolled and its staff are larger than the previous two PS case studies in this research, which together constitute the third category of PS KG buildings in this research.

## 6.6.2. KG background

### 6.6.2.1. History of the building

(MY) KG was originally built from concrete as a modern house in the early 1990s. Then the landlord converted the ground floor of his house to be used as a KG, whereas the first and the second floors are used as private flats for the KG landlord and his extended family. It should be pointed out that the KG pupils and staff share the same main entrance (Figure 239: zone 1) with two families, both of whom use a part of the KG as private homes (Figure 239). One of those two families belongs to the landlord of the KG himself.

### 6.6.2.2. Space syntax

This building has a modern pattern instead of the PS traditional patterns which are based on providing the house users with maximum protection, privacy and functionality, making closed houses by creating a special backyard or rest area for house members. The KG building was built as one chunky block (Figure 239), whereas the PS traditional houses were built as units, where storage areas, lavatories and sometime kitchens are completely separated from bedrooms. The traditional houses, especially types one and two, relied on multi-functional spaces such as guest rooms, which are used as bedrooms for children at night and a dining room at noon. Conversely, today each room in the modern PS house has one specific function.

#### 6.6.2.3. Structure

As a result of converting a modern house, the (MY) KG carries modern features that did not previously exist in PS traditional houses, such as large openings. Windows have become much bigger and wider and also have a broad form instead of a longitudinal shape. The outside doors are made from metal instead of wood and the window frames are made of aluminium instead of wood or steel. The height of the ceiling (approximately 3m) in this building is much shorter than used to seen in the old days (4.5m or even 6m). In addition, there is an absence of 'Aqid' style and thick walls; these have become much thinner and the roof is flatter and thinner too. This has occurred as a result of using new building materials and methods in the structure.

#### 6.6.2.4. Materials

(MY) KG was originally built as a modern house. Therefore, like the majority of current modern buildings in PS, the basic construction materials are: cement, cement blocks, iron and white stones for cladding the exterior walls (the first and the second floors). The front outdoor play areas have been covered by concrete.

#### 6.6.2.5. Characteristic

- Was visited on 19 June 2011 and December 2012
- Fully licensed KG
- Licensed to receive up to 120 children, but there were 129 pupils in the last academic year (2010/2011)
- Five teachers (including the landlord) and one for cleaning service
- It is a modern building which is built by using concrete blocks
- Has been converted from a modern house
- Owned by the KG landlord
- Has health insurance for all children (staff not included)
- Has twice annual health check for all children at KG
- Approximately 32 children in each class

- Usually they do not accept any new children in the Tamhedy Stage but they only upgrade their own pupils from Bostan Stage to Tamhedy Stage
- Has a shaded sand game area
- Has an abundance of outdoor play spaces
- Pupil's life-cycle at (MY) KG:

**A) Pupil's life-cycle at (MY) KG, the classroom No. 4 in the (MY) KG's layout [63]**

| Time | | 19 Dec 2011 (32 children) | 20 Dec 2011 (31 children) | 21 Dec 2011 (children 35) |
|---|---|---|---|---|
| 7≤8 | 07:00 | | | |
| | 07:10 | | | |
| | 07:20 | Open the facility to receive children | Open the facility to receive children | Open the facility to receive children |
| | 07:30 | | | |
| | 07:40 | | | |
| | 07:50 | | | |
| 8≤9 | 08:00 | Morning assembly | Morning assembly | Morning assembly |
| | 08:10 | Reading Quran | Reading Quran | Reading Quran |
| | 08:20 | Breakfast | Breakfast | Breakfast |
| | 08:30 | | | |
| | 08:40 | Math | Reading (Arabic) | Reading |
| | 08:50 | | | |
| 9≤10 | 09:00 | Writing | Teaching Quran | Writing (Homework) |
| | 09:10 | | | |
| | 09:20 | | | |
| | 09:30 | | Reading | Reading a group |
| | 09:40 | Play outdoor | | Writing |
| | 09:50 | | Writing | |
| 10≤11 | 10:00 | Reading (Arabic) | | Singing |
| | 10:10 | | | |
| | 10:20 | | | Breakfast |
| | 10:30 | Breakfast again | Breakfast & play outdoor | |
| | 10:40 | | | |
| | 10:50 | | | |
| 11≤12 | 11:00 | Play outdoor again | Painting | Drawing & painting (17 children ONLY) |
| | 11:10 | | | |
| | 11:20 | | Sport & music inside | |
| | 11:30 | | Clay Become 17 children ONLY | |
| | 11:40 | Singing | | |
| | 11:50 | | | Sport (indoor) |
| 12≤13 | 12:00 | | | |
| | 12:10 | Preparing the first group for leaving | Preparing the first group for leaving | Preparing the first group for leaving |
| | 12:20 | | | |
| | 12:30 | | | |

**Table 32: The overall number of children at (MY) KG is around 120 pupils and the number of children at this classroom is between 31 and 35**

[63] December 2011

**B) Pupil's life-cycle at (MY) KG, the main classroom, room NO. 5 at the KG layout**

| Time | | 19 Dec 2011 (34 children) | 20 Dec 2011 (32 children) | 21 Dec 2011 (33 children) |
|---|---|---|---|---|
| 7≤8 | 07:00 | Open the facility to receive children | Open the facility to receive children | Open the facility to receive children |
| | 07:10 | | | |
| | 07:20 | | | |
| | 07:30 | | | |
| | 07:40 | | | |
| | 07:50 | | | |
| 8≤9 | 08:00 | Breakfast | Breakfast | Reading Quran |
| | 08:10 | | | |
| | 08:20 | | | |
| | 08:30 | | | Breakfast |
| | 08:40 | | | |
| | 08:50 | Reading Quran | Reading Quran | |
| 9≤10 | 09:00 | | | |
| | 09:10 | Reading (Arabic) | | Reading (Arabic) |
| | 09:20 | | | |
| | 09:30 | Mathematics | Reading group (Arabic) | Mathematics |
| | 09:40 | | | |
| | 09:50 | Homework | Writing | Play inside |
| 10≤11 | 10:00 | | | |
| | 10:10 | | | |
| | 10:20 | | | |
| | 10:30 | Mathematics (exam) | Dancing & Music | |
| | 10:40 | | | Writing |
| | 10:50 | Play outside | Chatting | |
| 11≤12 | 11:00 | | | |
| | 11:10 | | Painting | Breakfast |
| | 11:20 | | | |
| | 11:30 | | | |
| | 11:40 | | | |
| | 11:50 | | Singing | Painting |
| 12≤13 | 12:00 | Singing | | |
| | 12:10 | | | |
| | 12:20 | Start leaving for home | Start leaving for home | Start leaving for home |
| | 12:30 | | | |

Table 33: The overall of children at KG is around 120 pupils and the number of children at this classroom is between 32 and 34

**C) Pupil's life-cycle at (MY) KG, the secondary classroom, room NO. 6 at the KG layout**

| Time | | 19 Dec 2011 (26 children) | 20 Dec 2011 (30 children) | 21 Dec 2011 (29children) |
|---|---|---|---|---|
| 7≤8 | 07:00 | | | |
| | 07:10 | Open the facility to receive children | Open the facility to receive children | Open the facility to receive children |
| | 07:20 | | | |
| | 07:30 | | | |
| | 07:40 | | | |
| | 07:50 | | | |
| 8≤9 | 08:00 | Reading Quran | Breakfast | Sport |
| | 08:10 | | | |
| | 08:20 | | | |
| | 08:30 | verbal exam | Sport | Reading Quran |
| | 08:40 | | | |
| | 08:50 | Breakfast | Reading Quran | Breakfast |
| 9≤10 | 09:00 | | | |
| | 09:10 | | | |
| | 09:20 | Math | Chatting | Chatting |
| | 09:30 | | | |
| | 09:40 | Reading Arabic | Writing | Math |
| | 09:50 | | | |
| 10≤11 | 10:00 | Breakfast again | Telling a story | TV programme |
| | 10:10 | | | |
| | 10:20 | Outdoor games | Play outdoor | Breakfast (rest) |
| | 10:30 | | | |
| | 10:40 | | | |
| | 10:50 | | | |
| 11≤12 | 11:00 | Clay | Dancing (Sport & TV) | Singing |
| | 11:10 | | | |
| | 11:20 | | | |
| | 11:30 | Watch Cartoon Videos (TV) | Painting | Watch Cartoon Videos (TV) |
| | 11:40 | | | |
| | 11:50 | | | |
| 12≤13 | 12:00 | Play | Play | Play |
| | 12:10 | | | |
| | 12:20 | Prepare to leave | Prepare to leave | Prepare to leave |
| | 12:30 | | | |

Table 34: The overall of children at KG is around 120 pupils and the number of children at this classroom is between 26 and 30

### 6.6.3. The general external view of (MY) KG

**Figure 232: The location of (MY) KG. Photo by Google Earth (2011)**

**Figure 231: The outside view of the (MY) KG shows the main gate of the KG**

**Analysing the external view of the KG building**

#### 6.6.3.1. Location

The KG is located on the outskirts of the city and its environs have beautiful scenery with magnificent views of the valley and the hills of old olive trees in the north. However, because of the surrounding walls and high windows, pupils are not allowed to enjoy this beautiful scenery while they are in the KG.

This peaceful area lost its quiet when heavy vehicles offloaded/loaded some building materials and equipment in the open arena that is ‘non-prepared for such uses’ (Figure 234). This open site, which is used as a store, is located directly in front of the main gate of the KG on the main road. It is considered a real threat to the safety of children as well as adult road users (pedestrians), not only because it is left non-gated and non-fenced, but also because it is left unguarded. In addition, next to (MY) KG there is a tyre repair store and an automobile repair shop. The tyre repair store disposes of the damaged and used heavy vehicle tires in front of this store (uncovered and unprotected on the main road) until collecting them to resell for recycling (Figure 233).

Figure 233: The way to the KG. The photo shows the main entrance of the KG next to the tyre repair store with its uncovered used tyres that are stored on the main road

Figure 234: Open store for building equipment and an automobile repair shop are located in front of the KG

#### 6.6.3.2. Outdoor spaces

The outdoor spaces are exposed to direct sun and wind. The lack of shaded areas is considered an obstacle towards efficient usage of these spacious open spaces (Figure 236). The front outdoor play areas have been covered by a concrete layer whose colour is a deep dull grey. This concrete flooring is not only unpleasant and a boring colour, but also its surface is not completely flat and such obstacles increase the possibility of falling on the hard surface (Figure 235). Exposed and uncovered pipes and wires in the outdoor play area were the main reason behind great concern for children's safety (Figure 272). The lack of green spaces has been noticed and the only plants seen were roses with harmful thorns and sticky bur grass, which is harmful to children because the sticky grass is spiky and sharp enough to pierce skin. The outdoor stairs do not fit to children's scales (Figure 238).

**Figure 235: A lot of barriers in the outdoor play area ground**

**Figure 236: The opened out play area in two levels. This area has a ramp for moving goods to the facility**

**Figure 237: The front view of the (MY) KG**

**Figure 238: Unsuitable stairs for human scales**

The (MY) KG's plan (Figure 239) shows that the facility has plenty of outdoor spaces but, because it is not shaded or well-protected, the KG loses several days in the winter and summer seasons, which makes this large area ineffective on rainy and hot days. This makes the sand games area (Figure 239: 12) the only place that can be used in such cases; despite its good size, this will limit the children's choice for play and fun while they could gain more benefits from using the spacious outdoor area. The plan suffers from a lack of green areas. It is easy to think that, because the KG is located at the edge of the city, the green open spaces around the site make up the shortfall here. However, the high windows and the high level of the concrete walls (150cm) obscure vision and prevent eye contact with outside, especially for children. In addition, the (MY) KG layout shows that the landlord's house (Figure 239: 14) and the KG itself share the same entrance (Figure 239: 1).

#### 6.6.3.3. (EM) KG's layout

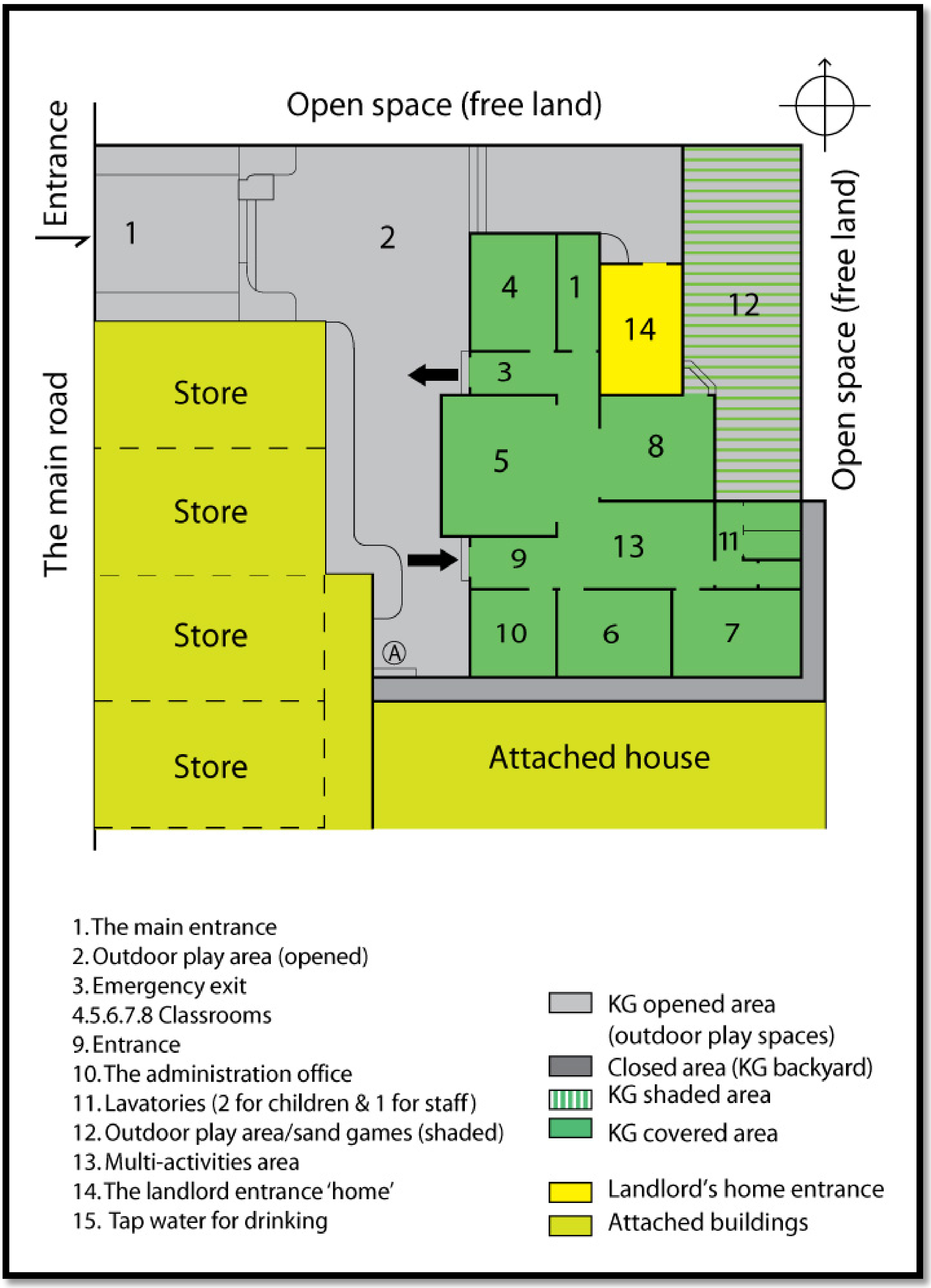



Figure 239: The (MY) KG's layout

### 6.6.3.4. Visual barriers

Although the relationship between the indoor spaces (classrooms) and the outdoor play area is more than acceptable, especially when compared to the first two case studies (EL & EM KGs), the relationship between the outdoor play spaces and the surrounding environment is a subject of concern. Children cannot maintain visual contact with the unique environment, which has a beautiful view of olive forests and almond trees (Figure 242).

This scenery has been blocked by high concrete walls that fence the (MY) KG (Figure 240). Although the height of the wall is variable, it is high enough to prevent children from making eye contact with the surrounding environment, while they are playing in the outdoor area or from the inside of their classrooms.

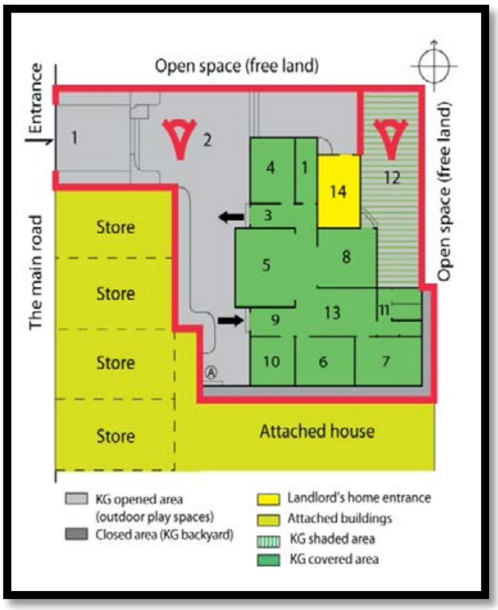



**Figure 240: Visual barriers between the outdoor spaces and the surrounded environment of (MY) KG**

The minimum height of the solid ugly grey wall, which is devoid of any decoration or illustrations, is approximately 1.5m in the sand area, and between 2m and 2.25m on the other sides.

### 6.6.3.5. Outdoor play area

This KG has a sand area, where outdoor toys have been installed. This outdoor area is shaded well but, as a result of a high wall (at a child's scale) that was built for protection, the children are deprived of viewing the beautiful scenery that surrounds them (Figure 242). It is believed that the outdoor toys in the sand game area are dangerous because many of the safety factors seem to be missing in terms of design and implementation. It seems that they were not originally designed by companies or individuals who are specialists or experts in thisarea, because safety procedures have not been followed in these toys. For instance, they not only have sharp corners and edges (Figure 241), but also they have moving parts between which children's fingers could easily be jammed, such as exposed swing chains. Moreover, they have been made from cheap materials that are not suitable for outdoor usage, such as untreated wood and uncoated metal sheets in these toys. As a result of this, the uncoated metal parts are covered by rust and the wooden seats have become cracked with sharp wood edges (Figure 243).

**Figure 241: Sharp corners in the outdoor play toys**

**Figure 242: Outdoor play area (sand games)**

**Figure 243: Dangerous game with sharp edges, lack of maintenance and safety**

**Figure 244: Inappropriate stairs**

**Water drinking in the outdoor play areas**

In addition, there is a shortage in the number of water outlets because the KG has a rate of 1 outlet per 26 children. However, because the majority of outlets are out of service, the actual rate becomes 1 outlet for per 43.3 children. This number does not include the staff, who have to share the same outlets with the pupils (Figure 245).

**Figure 245: Destroyed water outlets for children's drinking**

### 6.6.4. The general internal view of (MY) KG

This building is considered a 'modern' building[64] because it was built using concrete blocks and roof. Therefore, it was easier to convert such a building to be a KG. Modification of this house by the landlord has created a new relationship between rooms, as shown in the plan (Figure 246), especially between the service areas such as lavatories and the multi-activity areas. Semi-opened spaces and easy access is shown here, particularly in zones 5, 8 and 13, where a wide fixable door supports this view in room 5 (Figure 246). The sliding doors that are installed in room 5 (Figure 246: 5) not only allow ease of movement but also allow the classroom to expand to accommodate different activities, which increases the functionality of spaces. The internal visual view in this building is wide, which enables teachers to make eye contact with their pupils from the centre of the building. This can facilitate the monitoring process. In addition, the KG director has the ability to monitor the main entrance of the KG (zone: 9) from her location (zone: 10) (Figure 246).

[64] Compared with other cases in this study, which are (EL) KG building and (EM) KG building

The location of the emergency exit was 'fine', but it was recommended to open a new one in zone 12 on the opposite site of the main entrance (9). The KG does not usually have any cooking activities because all pupils have to bring their lunchbox daily. The kitchen is regularly used for preparing tea, coffee or some snacks for staff in the break time. The plan shows the lack of lavatory numbers per child, because the current PS licence

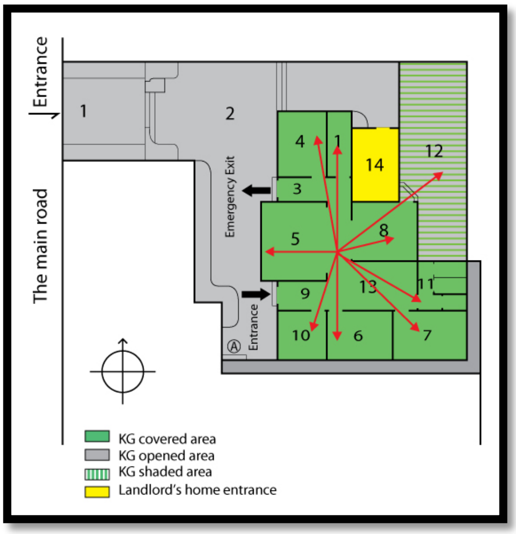



**Figure 246: Ease of movement**

regulations require one lavatory per 20 children, while this KG provides one lavatory per 62.5 children; even if the adult lavatory is counted, this only gives approximately 31 children for each lavatory, which cannot meet the requirements. The plan shows ease of movement between the interior spaces, which takes a radial form.

It should be pointed out that after entering the building, the first impression was positive. What draws the attention in this building is the width of its windows and good lighting in most of the classrooms (Figure 248), with natural and artificial lighting systems. The only zones that may have a lack of natural light is zone 13 (Figure 246: 13), where the most popular and interesting activities occur because the majority of internal toys and games are installed in this practical area (Figure 249 and 250).[65] All the existing windows have been installed 105 cm high from the inside room surfaces, which does not facilitate eye contact with the outdoor environment for all children because the majority of children's height/length in this age-group falls between 103cm and 115cm (WHO, 2006).

[65] The future experiment about the quality of space will examine this issue: the amount and distribution of light in (MY) KG

Further reasons for a positive impression of the interior spaces are the multi-activity zones (Figure 249, 250 and 252), colourful environment, lovely drawings and decoration for children installed on ceilings and the inner walls (Figure 251) and open spaces (Figure 247).

**Figure 247: Multi-purpose open space in the KG**

**Figure 248: A wide window in a classroom which views the outdoor play area. showing the connection between inside and outside in the KG classroom**

**Figure 249: Kitchen section, which is one of the play activities in the KG, zoon (Figure 239: 13)**

**Figure 250: Store area for children's toys (Figure 239: 13)**

**Figure 251: Art papers from the ceiling that have been used in one of the KG classrooms**

**Figure 252: First aid-kit section (Figure 239: 13)**

In brief, this plan may show the best interior design among the case studies in PS because of the freedom of movement inside the building, links between its rooms, the relationship between the most active areas (zones 5, 8 and 13) and services, and the ease of monitoring and controlling the main entrance by the KG director. However, the lack of services in the outdoor areas (1, 2 and 12) such as lavatories and sharing the same entrance with other families, the lack of contact with the surrounding environment, and the relationship between inside/outside are of concern in this plan.

## 6.6.5. Results: The third case study (MY) KG

### 6.6.5.1. The lighting quality: The amount of light

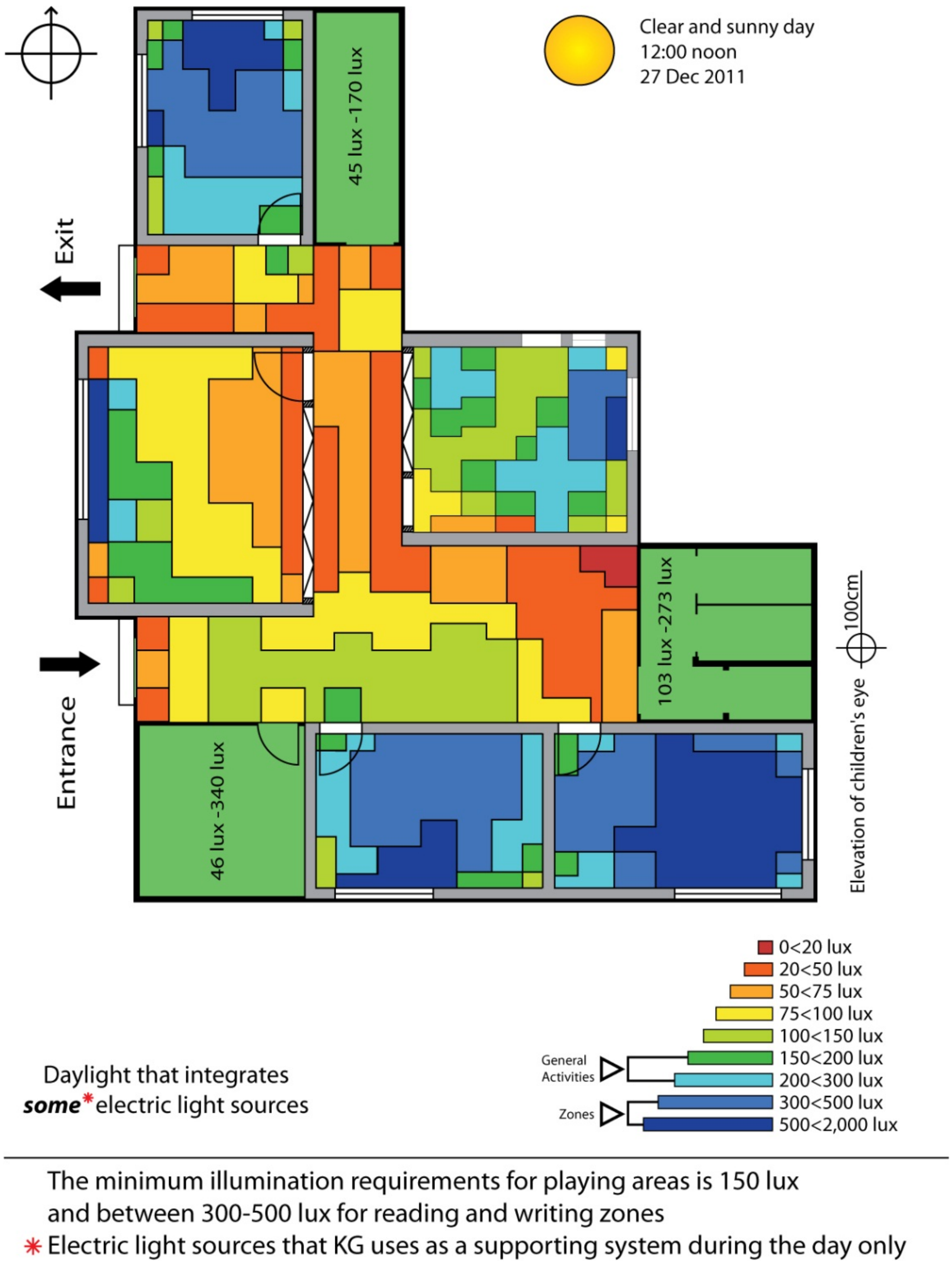



**Figure 253: The plan shows the distribution and intensity of internal lighting in the (MY) KG during a sunny day with the use of lighting systems support**


**Figure 254: The plan shows the distribution and intensity of internal lighting in the (MY) KG during a clear night by depending on the lighting systems (artificial lit)**

**A) Multi-purpose classroom, room No. 8 at the KG's layout**

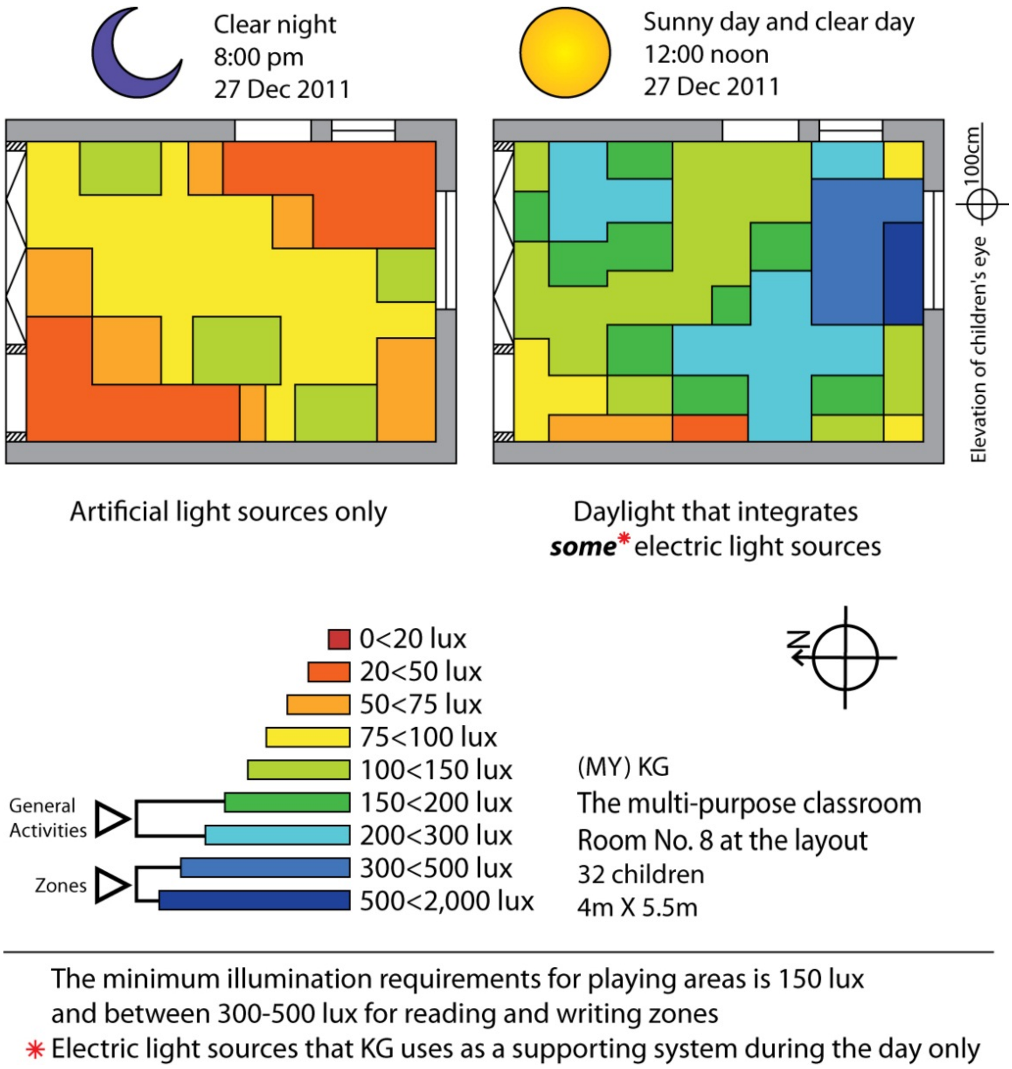



Figure 255: The lighting quality of the room (No. 8) at (MY) KG during day and night

**B) Lighting quality of the secondary classroom of (MY) KG, room (No. 7) at the KG layout**

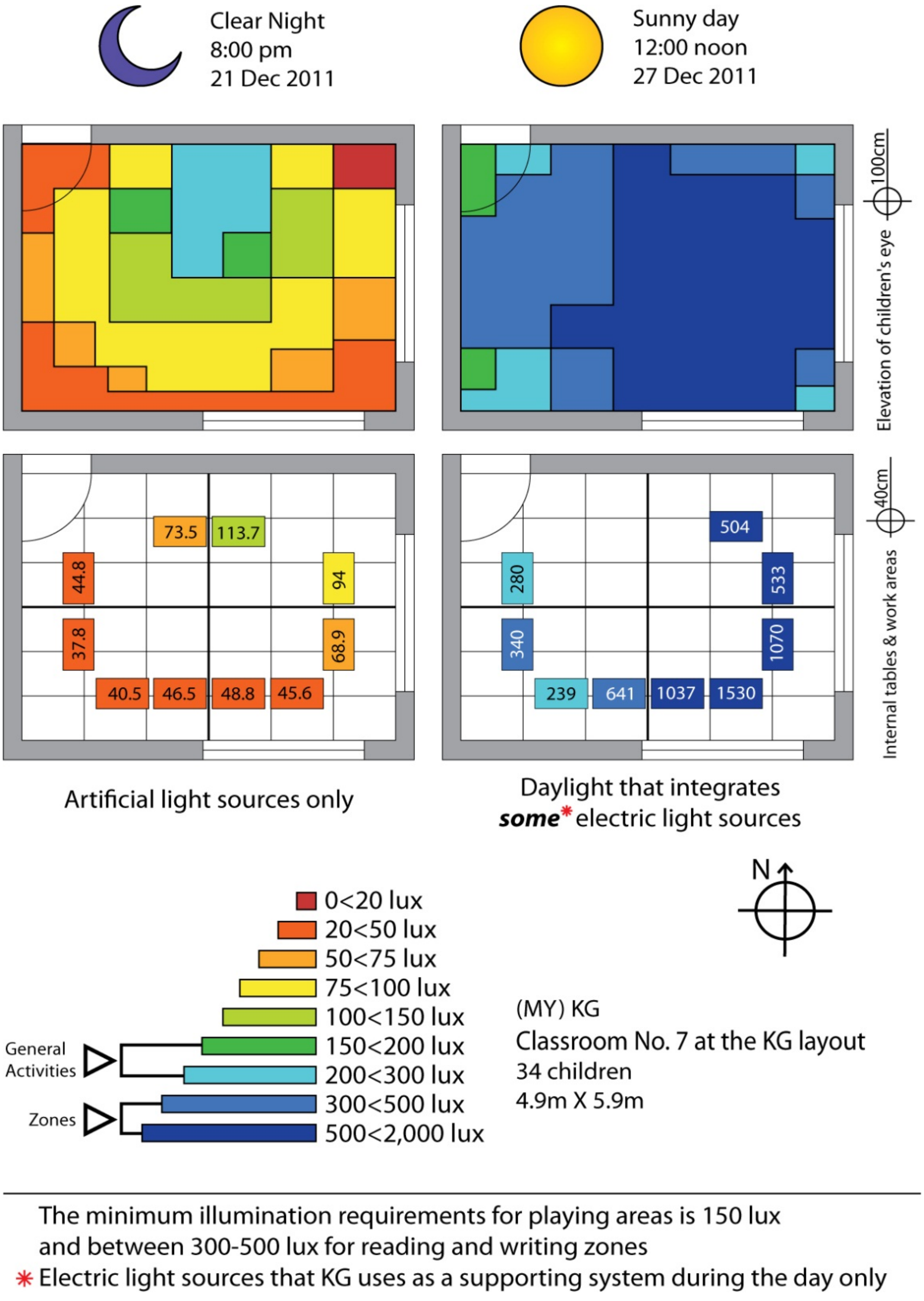



**Figure 256: The amount and distribution of light entering the room (No.7) at (MY) KG during day and night, for more tails please (Appendix 7)**

**C) Secondary classroom, room (No. 6) at the KG layout**

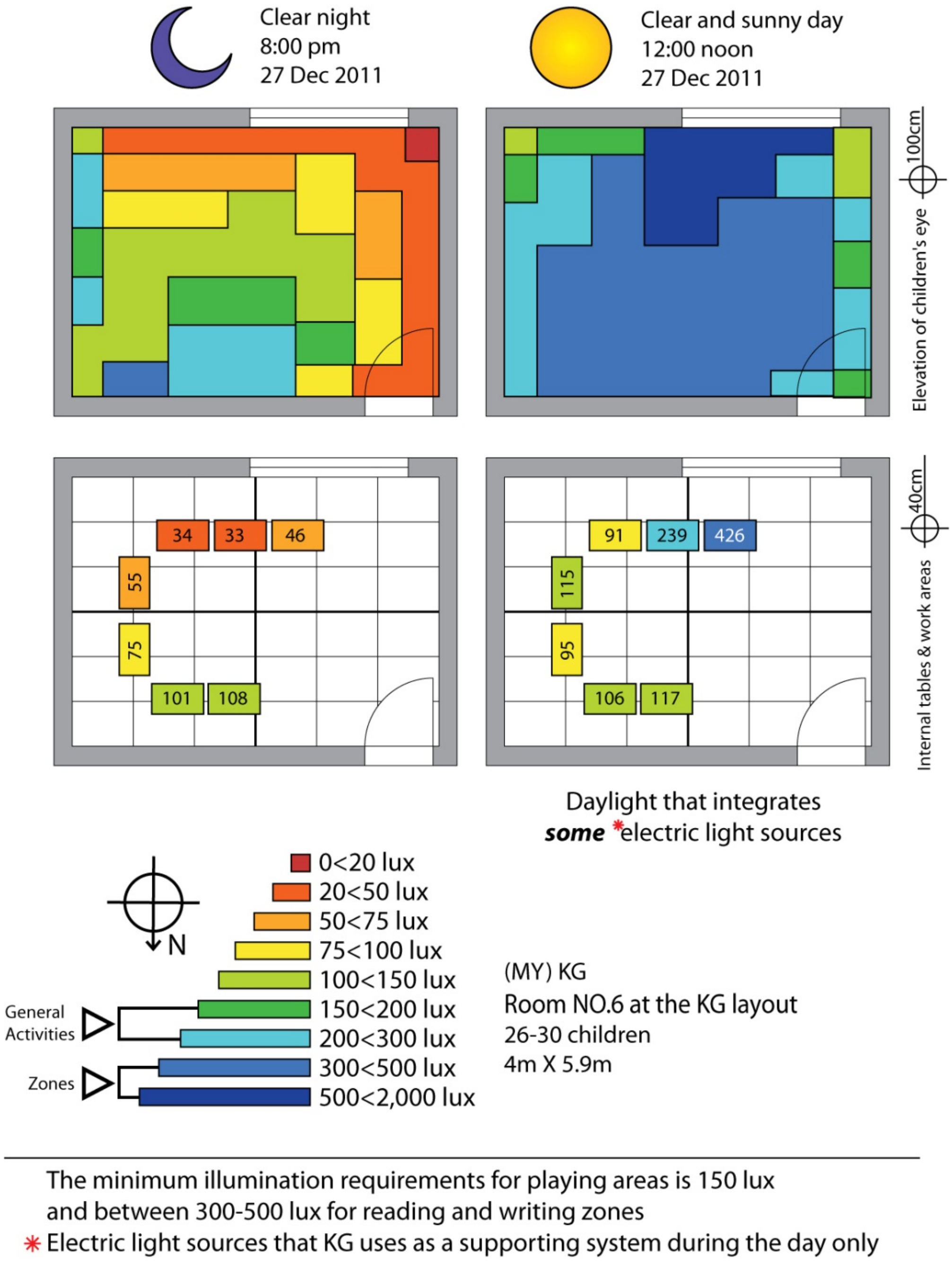
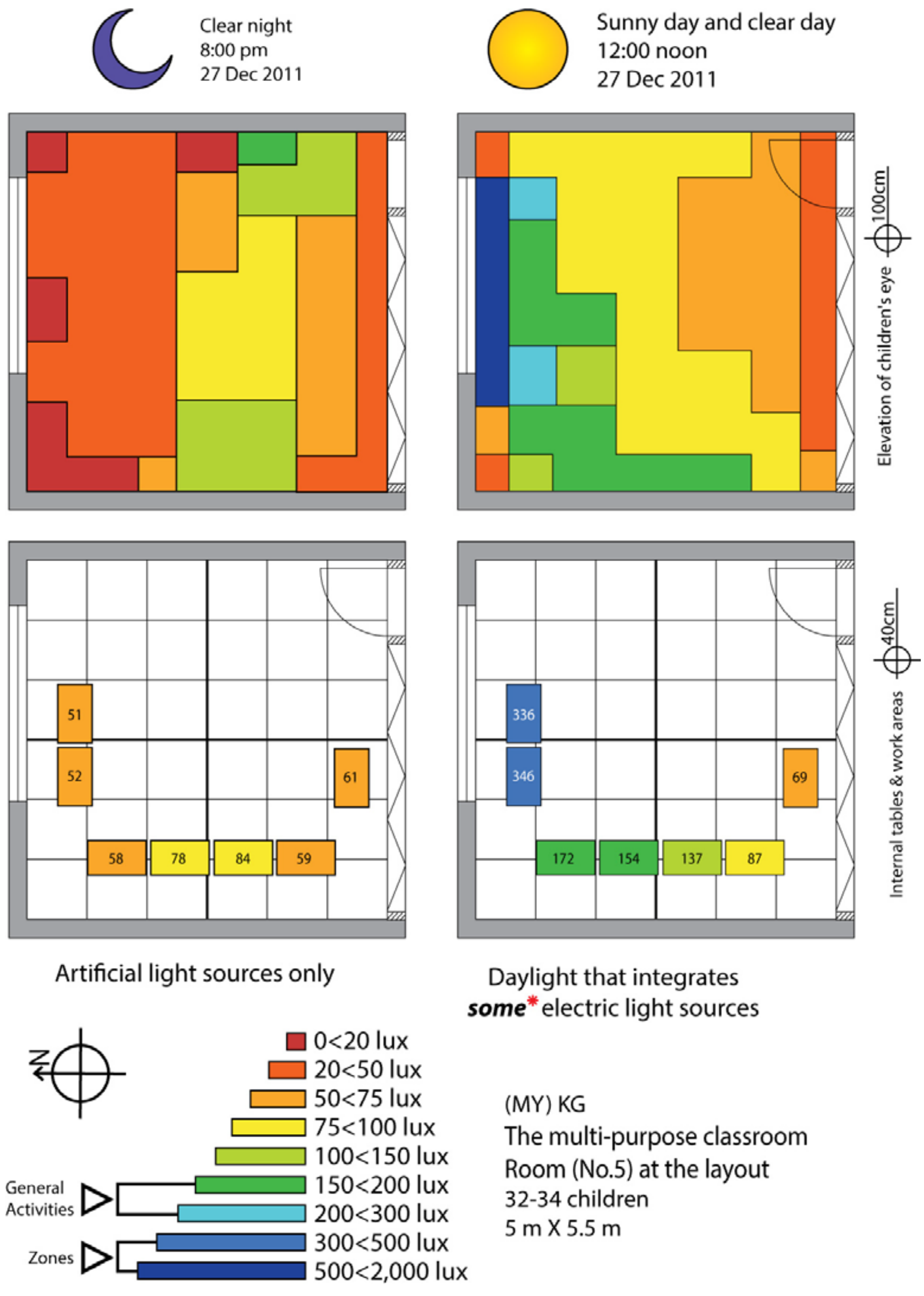



**Figure 257: The amount and distribution of light entering the room (NO.6) at (MY) KG during day and night**

**D) Lighting quality at (MY) KG, room (No.5) at the KG layout**




The minimum illumination requirements for playing areas is 150 lux
and between 300-500 lux for reading and writing zones
* Electric light sources that KG uses as a supporting system during the day only

**Figure 258: The amount and distribution of light entering the main classroom, room (No. 5) at (MY) KG during a clear sunny day**

**E) Lighting quality at (MY) KG, room (No. 4) at the KG layout**

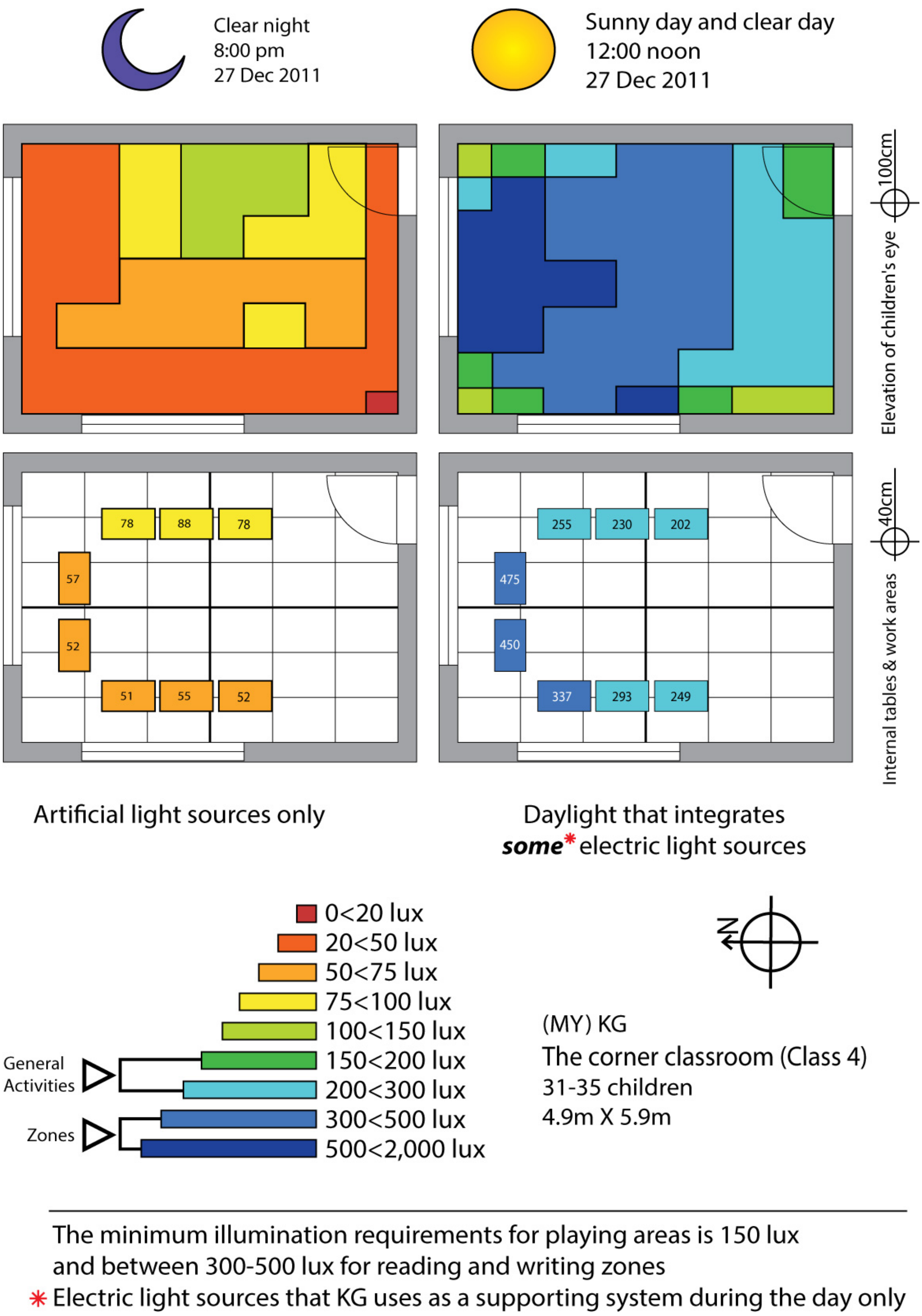



Figure 259: lighting quality of the classroom No. 4 at (MY) KG during day and night

| | Analysing the amount and the distribution of light in (MY) KG classrooms | | | | | |
|---|---|---|---|---|---|---|
| Time | Night | | | Day | | |
| Type of tasks occurring within the space | Visual tasks +40cm | General tasks +100cm | General tasks +40cm | Visual tasks +40cm[66] | General tasks +100cm | General tasks +40cm |
| Min. Standards lux | >300 | >150 | >150 | >300 | >150 | >150 |
| 1st Classroom (Room No. 8) | Not eligible[67] | 0% | 0% | Not eligible | 48% | Not eligible |
| 2nd Classroom (Room No. 7) | 0% | 14.28% | 0% | 77.77% | 100% | 100% |
| 3rd Classroom (Room No. 6) | 0% | 24.44% | 0% | 14.28% | 93.9% | 28.57% |
| 4th Classroom (Room No. 5) | 0% | 2% | 0% | 22.57% | 28.57% | 57.1% |
| 5th Classroom (Room No. 4) | 0% | 0% | 0% | 37.5% | 91.8% | 100% |
| Multi-activity area (zone 13) | Not eligible[68] | 0% | 0% | Not eligible | 0% | 0% |

**Table 35: The percentage of covered spaces that could meet the minimum amount of light for different types of activities (visual tasks and general tasks) within the internal spaces of (MY) KG, Dec 2011**

| | Analysing the amount and the distribution of light in (MY) KG classrooms | |
|---|---|---|
| Time | Night | Day |
| Type of tasks occurring within the space | General tasks +100cm | General tasks +100cm |
| Min. Standards lux | >100 | >100 |
| Corridor | 5.08% | 24.56% |

**Table 36: The percentage of corridor area that could meet the minimum amount of light in (MY) KG, Dec 2011**

The primary results (Table 36) show that half the activity zones in (MY) KG could meet more than 91% of the minimum amount of lighting requirements for general tasks during KGh. In addition, on average, (MY) KG classrooms could achieve 71% of the minimum amount of light for visual tasks during KGh. However, the multi-activity area showed the worst results,

[66] In recording the amount of light for visual tasks (+40cm), it has been taken on the interested spots?– what does 'the interested spots' mean? only, such as table surfaces and work areas

[67] According to (MY) KG there are no visual tasks occurring in Multi-activity area (room No. 8), such as reading or painting. Thus, there are no tables or working areas in this classroom.

[68] According to (MY) KG there are no visual tasks occurring in Multi-activity area (zone 13), such as reading or painting

achieving 0% of the minimum amount of lighting requirements in both general and visual tasks during KGh.

Regarding the corridor area that requires at least 100lux, it has been noted that only 24.56% of its spaces could reach the minimum limit (Table 38). Although the general amount of light that enters the (MY) building may be enough to cover the majority of spaces, the corridor has not received its share because of the full height wall sections (the interior walls) that block the light and prevent it from accessing the heart of the KG where the corridor is located. Moreover, the absence of skylight and the interior reflectors cannot help the daylight to access to such area. Finally, the poor supporting system in this practical area does not compensate for the shortfall of natural lighting.

On average, approximately 38.03% of zones, which are supposed to be designed well for visual tasks, could meet the minimum amount of lighting requirements for such activities. The maximum amount of light was in room No. 7 (77.77%), whereas the worst results were recorded in room no. 6 (14.2%). It should be pointed out that the main classroom (room No. 5) not only could not reach the minimum limits for both visual and general tasks, but also has one of the worst results in the (MY) KG classrooms (Table 37).

Table 37 gives a clear indication of the participation of the current artificial lighting systems in providing the proper amount of light for the interior spaces of (MY) KG. The table shows poor support from these supporting systems, which was limited to between 0% and 24.44%.

**F) The type and the percentage of activities during (MY) KGh**

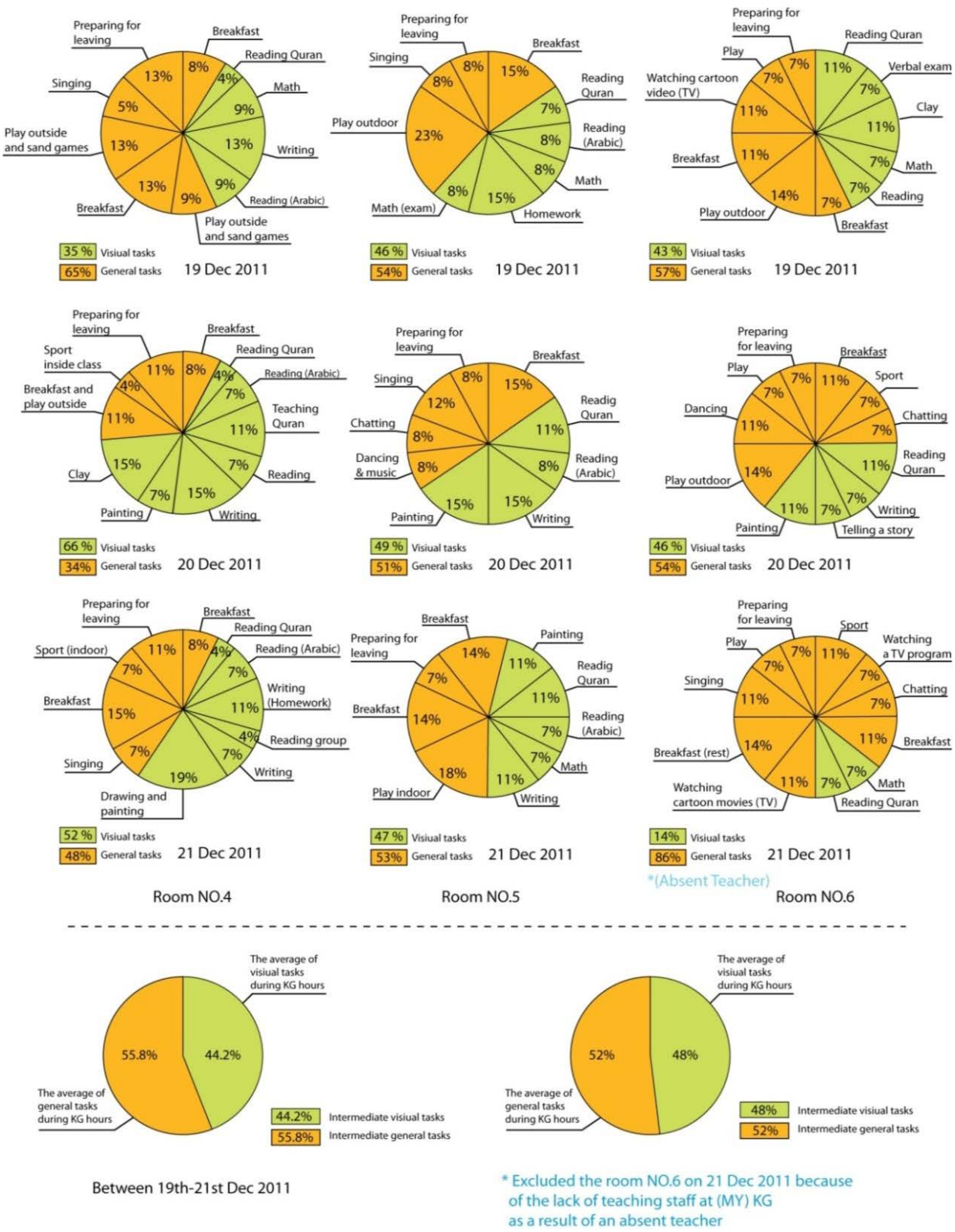



**Figure 260: KGh at (MY) KG that show the percentage of visual and general tasks during the field study between 19 and 20 Dec 2011, the data are linked to tables 32-34**

According to pupils' life-cycle at (MY) KG (Table 32-34), the pie charts (Figure 260) indicate that between approximately 44.2% and 48% of (MY) KG daily activities are considered visual tasks, which need special lighting requirements with a minimum amount between 300 to 500 lux. Although about 71% of interior spaces can meet the minimum lighting requirements of general tasks, which consist 44.2% (MY) KG activities, only 38.03% of (MY) KG work areas and spots could meet the minimum requirements for visual tasks.

#### 6.6.5.2. Carbon dioxide ($CO_2$) levels of (MY) KG

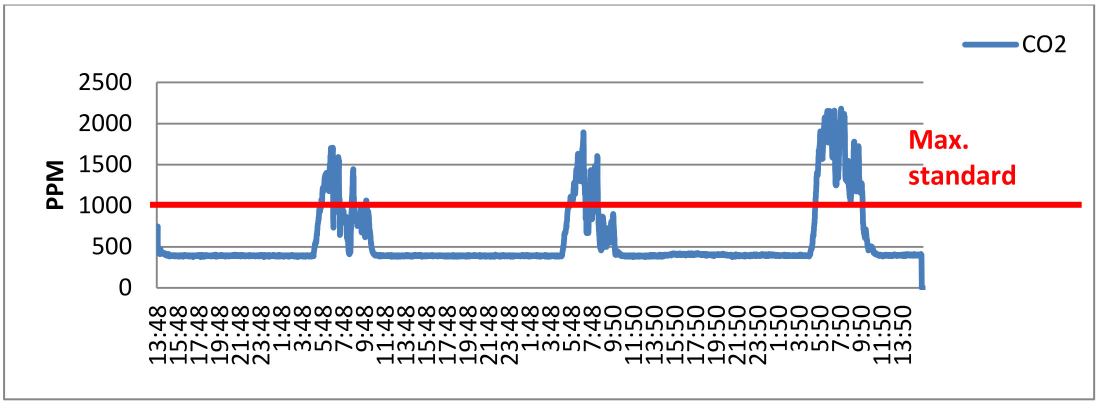



**Figure 261: The $CO_2$ levels inside the main classroom of (MY) KG during the experiment days (GMT +2:00) in Jerusalem. The maximum recommended $CO_2$ level is 800ppm, whereas the maximum standard $CO_2$ level is 1,000ppm**

The previous graph (Figure 261) shows that the concentration of $CO_2$ was over the limit during the entire KGh between 19 and 21 Dec 2011. In addition, the relationship between the maximum level of $CO_2$ and the maximum outdoor temperature (Figure 263) can be noted. In other words, any drop in the outside temperature is combined with an increasing concentration of $CO_2$. In addition, Figure 262 shows that the lower temperature leads to an increase not only in the amount of $CO_2$ but also in the amount of time that class spends with these unsafe levels of $CO_2$. The amount of $CO_2$ inside the classrooms exceeds +275% of the universal standard (800ppm), when it reaches 2,200ppm. It should be pointed out that that this even occurred on sunny days (Figure 263) when the amount of $CO_2$ was more than double the maximum limit (Figure 262).

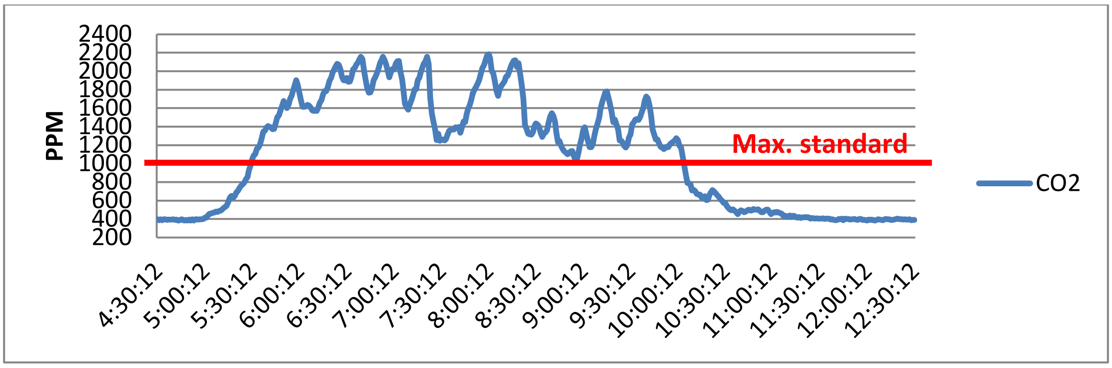



**Figure 262: The $CO_2$ levels inside the main classroom of (MY) KG during KGh between 07:00am and 01:30pm (GMT +2:00) in Jerusalem. The maximum recommended $CO_2$ level is 800ppm, whereas the maximum standard $CO_2$ level is 1,000ppm**

### 6.6.5.3. The outdoor temperature and humidity rate of (MY) KG

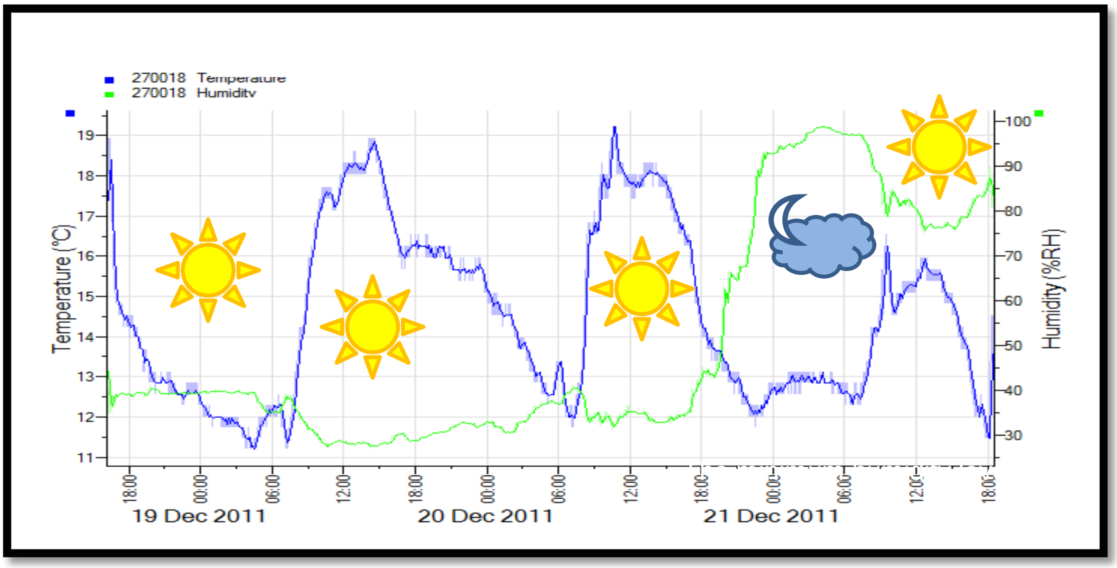



**Figure 263: The outside temperature and humidity levels of (MY) KG during three days, between 19 Dec and 21 Dec 2011 (Appendix 8).**

The above chart shows the weather during the experiment days in (MY) KG. It focuses on three factors: the outdoor temperature, the outdoor relative humidity and if they were cloudy, sunny or rainy days.

The weather was sunny and clear during the entire KGh, but it should be pointed out that it was showery the night before 21 Dec 2011, which led to an increase in the outdoor humidity, reaching close to 100%RH. In addition, the outdoor temperature dropped rapidly from 19.2$^{O}$C to 11.8$^{O}$C. There is no doubt that the outdoor temperature and high humidity level will have had a great impact on the indoor environment of the (MY) KG (classrooms). This will have been a natural result of the complete absence of heating systems and the low thermal insulation of the buildings, which will be shown in the next outcomes.

#### 6.6.5.4. The internal temperature and humidity rate of (MY) KG

Although the required temperature for KG buildings is between 18$^{O}$C and 23$^{O}$C, the indoor temperature was below these standards in the main and secondary classrooms (Figure 239: Rooms 4 and 5) during the entire KGh in this experiment between 19 and 21 December 2011 (Figures 160 and 161). However, it should be pointed out that classroom No. 6 was almost on the line for the majority of KGh in terms of the minimum limit of the indoor temperature during the same period (Figure 266).

What can be noticed from Figure 312 to Figure 314 is the strong relationship between the outdoor and the indoor temperature inside the (MY) KG, which was as a result of the following factors: the low thermal insulation of the building, the impact of common air leak[69] and the complete absence of heating systems. Therefore, the building does not provide proper protection in this issue, which is in contrast to the PS traditional building in the (EL) KG case study. Although the (EL) KG building has similar classroom size, number of children and does not have any heating systems similar to this case study in (MY) KG, the difference (gap) between the indoor and outdoor temperature was bigger. In addition, the indoor temperature in (EL) KG was more stable than in (MY) KG classrooms (Figure 172). In brief, it can be said that the quality of indoor spaces in the (MY) KG depends on the outdoor changes.

The same problem can be noted in the indoor humidity as well, which was strongly affected by the outdoor weather. The figures show that the indoor temperature was only in the

[69] KG openings such as metal doors and aluminium windows with poor insulation show common air leak spots because of the poor quality of assembly and installation

desirable range when the outdoor humidity was already within this range (40%RH to 60%RH) on 19 and 20 Dec 2011. However, the interior environment could not maintain this level when the outdoor temperature exceeded these limits (the minimum or the maximum levels), such as that which occurred on 21 Dec 2011 in all classrooms during KGh (Figure 164-166). It can be said that the gap between the outdoor and indoor humidity levels is very narrow, because the recorded figures were so close in both cases (0.9%RH-9.2%RH), whereas it was between (0%RH and 27.3%RH) and also (20.9%RH and 39.6%RH) in (EL) KG.

| During KGh | Minimum gap between indoor and outdoor humidity (%RH) | Maximum gap between indoor and outdoor humidity (%RH) | While the maximum average of humidity | Minimum gap between indoor and outdoor temperature (°C) | Maximum gap between indoor and outdoor temperature (°C) | While the minimum average of temperature |
|---|---|---|---|---|---|---|
| (MY) KG 19 Dec | 2.2 | 10.7 | 44.6 | 0 | 2.8 | 11.7 |
| (MY) KG 20 Dec | 0.9 | 9.2 | 44.3 | 0.2 | 3.1 | 12.4 |
| (MY) KG 21 Dec | 3.7 | 17 | 96 | 2.2 | 3.5 | 12.7 |
| (EL) KG 22 Dec | 0.9 | 25 | 86.1 | 0.8 | 6.9 | 8.5 |
| (EL) KG 26 Dec | 20.9 | 39.6 | 96.8 | 3 | 7.2 | 7.3 |
| (EL) KG 27 Dec | 0 | 27.3 | 94 | 3.8 | 8.5 | 6 |

**Table 37: The difference between (MY) and (EL) KG buildings, in terms of the indoor and outdoor of both temperature and relative humidity during their KGh**

The above table indicates the quality of the structure's thermal insulation and the impact of building material moisture adsorption and desorption[70] on indoor air humidity by showing the difference (gap) between the indoor temperature and the outdoor temperature of the modern (MY) and traditional (EL) buildings in this study. The results show that the gap was bigger in the traditional buildings, which is considered indicative of the quality of installation in this kind of building. This may refer to the nature of building materials, building structure and design[71].

[70] In PS traditional building, (EL) KG
[71] More studies need to be done on this issue.

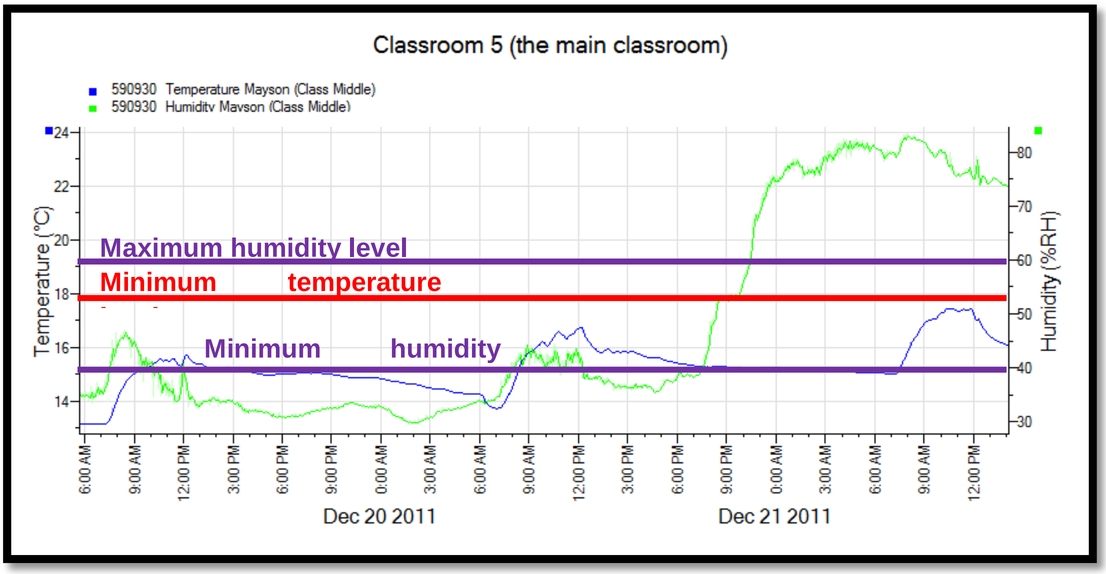



**Figure 264: The internal temperature and humidity levels of (MY) KG within three days in the main classroom (No. 5) (for more details see Appendix 9).**

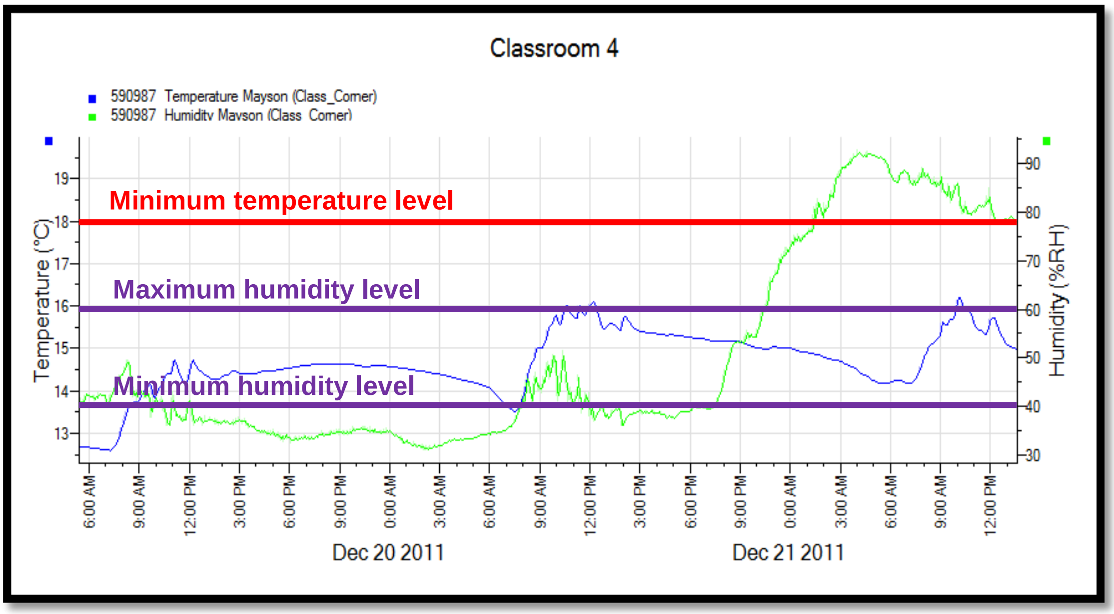



**Figure 265: The internal temperature and humidity levels of (MY) KG within three days in the classroom (No. 4)**

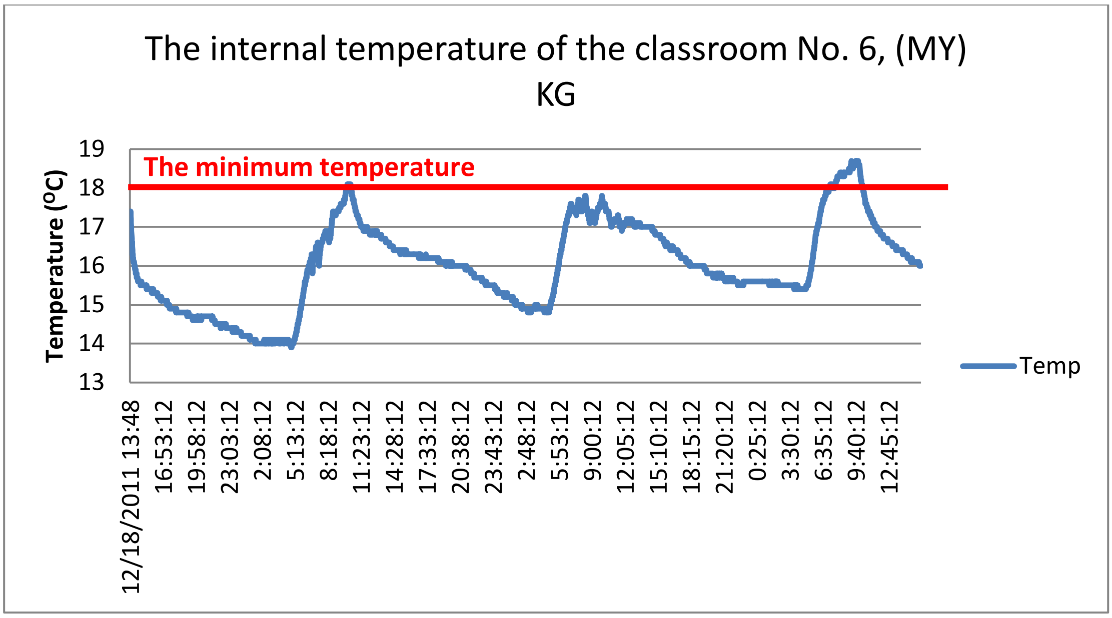



Figure 266: The indoor temperature in the classroom No. 6 of (MY) KG during the experiment period that was between 19 Dec 2011 and 21 Dec 2011 (GMT +2) in Jerusalem.

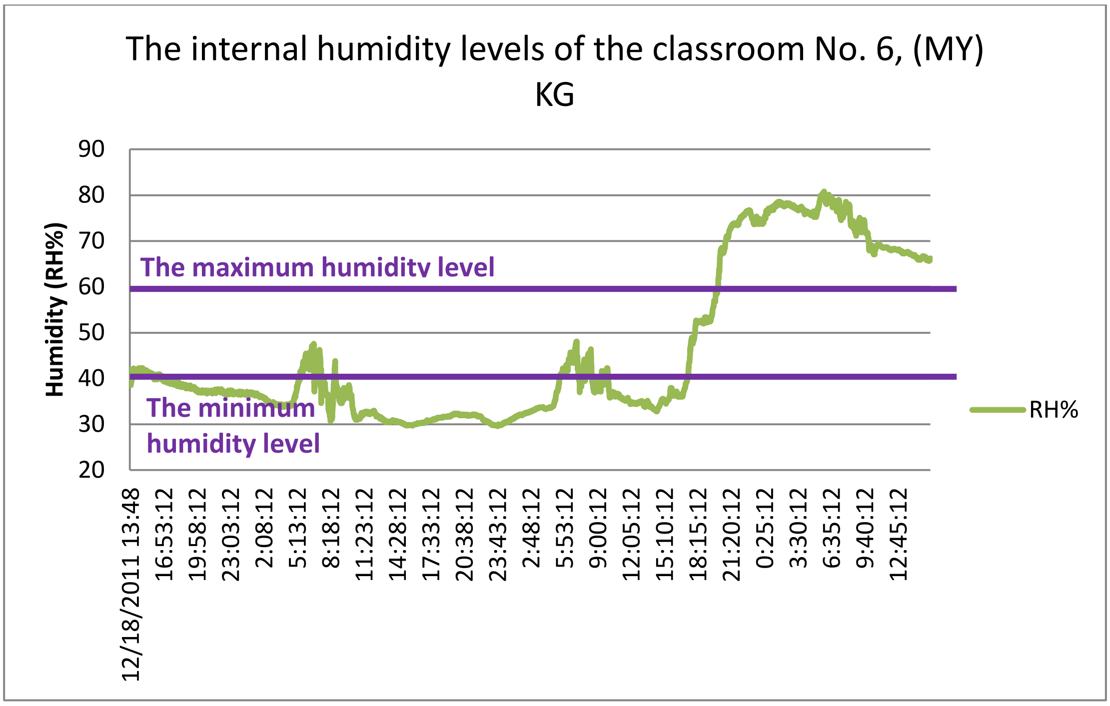



Figure 267: The internal humidity levels of room No. 6 in (MY) KG, 19 Dec 2011(GMT +2) in Jerusalem.

### 6.6.6. Extra problems related to the (MY) KG management

- No heating system or any heating methods have been installed in this facility
- No fire alarm system has been installed in the KG
- Expired fire extinguishers (Figure 273)
- Many of the items contained within a First Aid Kit have expired (Figure 270)
- The concrete layer in the outdoor play area is uneven and has some potholes, which increase the risk of falling on solid ground
- Use of hard flooring tiles for the interior spaces (Figure 247), which are too cold in the winter season, especially because children of this age like to play close to the ground and sit directly on the floor
- Lavatory kit such as a ceramic sink does not fit to children's scales and it is installed in too high a position for children's use (Figure 271)
- The lack of maintenance works in the outdoor areas and outdoor games
- Some uncovered electric sockets, that have been installed in a low position (Figure 269)
- Heavy and unsafe metal doors for children's use (Figure 268)
- Barbed wire, cables, an uncovered pumper and broken cement blocks were all recorded in the outdoor play area where any child could reach them (Figure 272)
- Inappropriate plants in the outdoor play area because of sharp thorns.

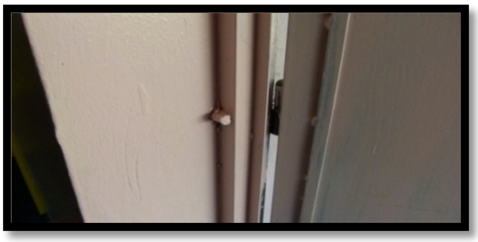


**Figure 268: The risk of injury as a result of trapping their fingers in doors (insecure metal doors)**

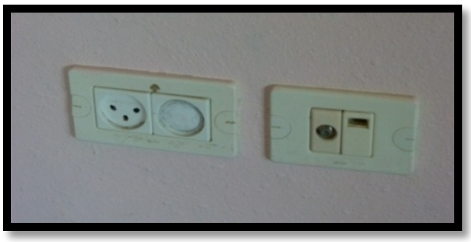


**Figure 269: Some uncovered electric sockets in a low position**

**Figure 270: Expired medicine in the KG first-aid kit**

**Figure 271: Unsuitable for children's body scale**

**Figure 272: Pipes and dangerous materials**

**Figure 273: According to the label, this fire extinguisher should have been refilled in May 2008**

## 6.6.7. Summary

### 6.6.7.1. Unapplied regulations

The (MY) KG bypasses the current PS regulations (2010) on many points, by ignoring meeting the items below, which are:

| Item No. | General regulations | |
|---|---|---|
| 4. | Each activity must not exceed 30 minutes (Table 32-34). | X |
| 5. | There is no homework (Table 32-34). | X |
| 6. | There are no exams or marks, but there is feedback for assessment (Table 32-34). | X |
| | A) Indoor | |
| 4. | The building should be well-lit, have good ventilation and appropriate lavatories that meet the engineering and health requirements ( Figure 253). | X |
| 5. | The KG building should be detached and have its own entrance, lavatories and its own outdoor play area (see Page 355). | X |
| 9. | One lavatory for each 20 children, or less (see Page 360). | X |
| 10. | The lavatory should fit to a child's scale (Figure 271) | X |
| 11. | There should be proper water outlets for drinking that are fit for a child's scale and should be installed far away from lavatories (see Page 359) (Figure 245). | X |
| | B) Outdoor | |
| 2. | At least 25% of the outdoor area should be shaded (Figure 239) (see Page 355). | X |
| 5. | It is prohibited to install a manhole in the outdoor play area | X |

contd.…/

| | | |
|---|---|---|
| | The KG furniture and equipment | |
| 4. | A cupboard without handles for each child to store her/his personal belongings; in addition, each cupboard must have a hanger for their coats (NOT available). | X |
| | The outdoor toys in KGs | |
| 2. | The outdoor toys should be secure and safe (Figures 137 and 139) (see Page 358). | X |
| 3. | They should be made of fiberglass and meet the safety requirements (Figures 137 and 139) (see Page 358). | X |
| 3. | Taking into account keeping at least 3m between one game and another. | X |
| 4. | Three-wheel bicycle, small trolleys for children's use and other suitable toys (NOT available). | X |
| 6. | Gardening tools that are appropriate for children (NOT available). | X |
| | Methods of protection and safety in KGs | |
| 1. | Each KG must have fire extinguishers (Expired) (Figure 273). | X |
| 2. | Each KG must have a first-aid kit that has a collection of all necessary supplies and equipment for use in giving first aid (Expired or used empty medicine bottles) (Figure 270). | X |
| 4. | KGs should be free of obstacles such as barbed wire and stairs (Figure 272). | X |
| 5. | KG gates and walls should be safe and secured (Figure 268). | X |
| 8. | Safe electric sockets should be installed at a high position (Figure 269) | X |
| 9. | All sorts of stairs should have a handrail, regardless of the number of these stairs (Figures 132, 134 and 140) | X |
| 10. | The main entrances must have barriers in front of them for protection. | X |

**Table 38: Table shows the missing items that (MY) KG could not meet in terms of the current PS regulations, 2011**

### 6.6.7.2. Advantages and disadvantages of the (MY) KG

**A) Advantages**

1. It has much wider and more windows than (EL) KG and (EM) KG
2. Relies on daylight as the main source of lighting
3. Open exterior and interior spaces (fewer barriers)
4. More functional design
5. Relationship between the internal spaces and activities zones
6. Easy to maintain
7. The building is cheaper to modify to meet future safety or quality requirements, which occurs as a result of the nature of modern building materials and the construction methods that have been used in this building
8. The outdoor and indoor spaces are easy and inexpensive to develop to serve wheelchair users

**B) Disadvantages**

1. Does not reflect the PS traditional heritage or culture in building or life
2. Does not carry the main PS building features
3. Does not respect children's scales[72]
4. It has boring and unsafe outdoor spaces
5. Lack of shaded areas
6. The majority of KGh was spent inside the building
7. Its outdoor space does not relate to the KG and cannot support their needs and goals
8. The relationship between indoor spaces and outdoor environment is missing
9. Thin walls[73] and low insulation materials
10. Metal doors and aluminium windows with poor quality of assembly and installation, which is a major source of air leakage and heat loss
11. No heating systems
12. No fire alarm system
13. Unsafe outdoor toys
14. Lack of outdoor toys compared to the number of students and the KG capacity
15. Very poor lighting quality in the multi-activity area and corridor
16. High humidity and $CO_2$ levels during KGh
17. Low indoor temperature as a result of the absence of any heating system
18. Shares its entrance with other occupants

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[72] It is related to the lavatories kit, stairs dimensions, openings mechanism and their height installations, door safety requirements for children's use.
[73] Compared to the PS traditional walls

## 6.7. SUMMARIES OF THE THREE CASE STUDIES

The three PS KGs in the previous case studies display a severe lack of interior lighting in the middle of clear and sunny days. Although the shortage was recorded in all KG buildings, the worst result was in the KGs that were converted from the 'old school' of PS traditional buildings, such as (EL) KG (Figure 274). On the other hand the best results were recorded in the KGs converted from modern buildings, such as (MY) KG (Figure 274).

It is believed that all previous problems could be related to the design factor[74] because PS traditional buildings follow a special design that guaranteed maximum privacy and protection from external enemies at the time of construction. Today, this kind of over-protection and the exaggeration of privacy may not be commensurate with the nature of the new places as KGs, because the needs of the building users have changed since they were built.

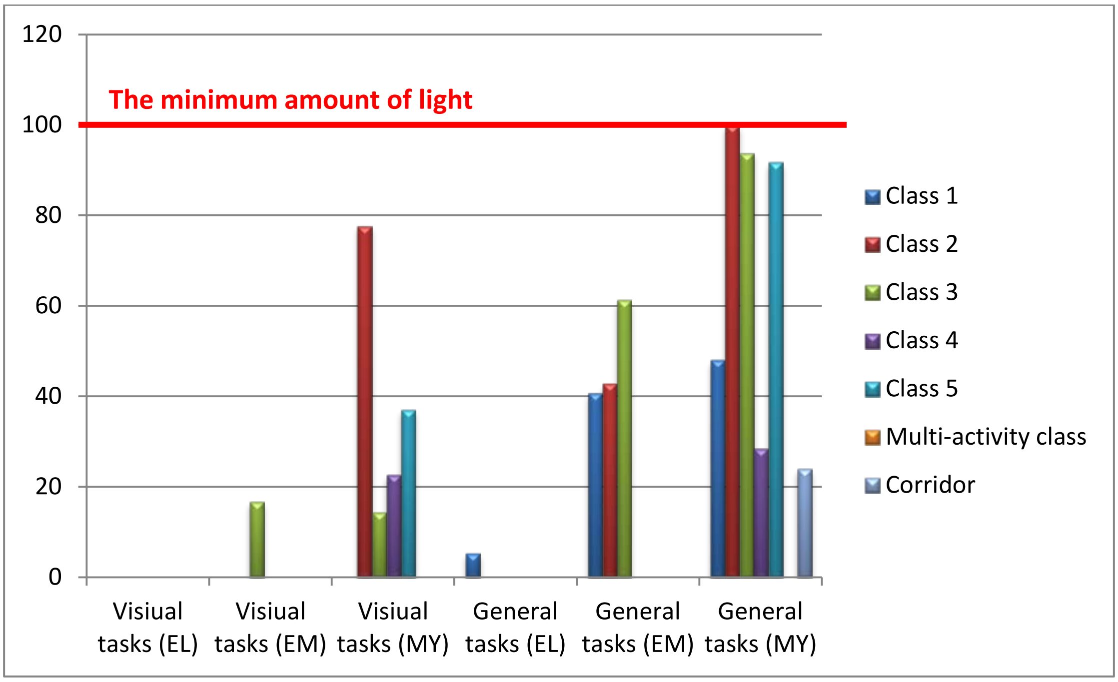


**Figure 274: The minimum amount of light (standards) in the previous case studies (EL), (EM) and (MY) KGs, 2011/2012**

[74] See the impact of leaving the main door opened on the amount and the distribution of light in the (EM) KG.

All case studies show a serious problem related to the indoor temperature factor, which was below the minimum standards all the time (Figure 275), even when recording these figures on sunny days in Dec 2011/Jan2012 (Figure 163, 205 and 253). It is clear that the main cause of this problem is the complete absence of heating systems in these facilities, which are necessary when the outdoor temperature becomes very close to freezing point in the winter. Relying on wearing thick clothes is not a practical solution and has a lot of negatives which are mentioned earlier in this study (Page 295). However, it is believed that design can play a vital role because of the impact of thick walls and the use of traditional materials in PS traditionally-built 'Aqid' houses, which were converted later to become KG facilities. These houses such as the first case study (EL KG) have a higher degree of thermal insulation than modern buildings (Figure 275).[75] Figure 275 shows that although the average outdoor temperature in (EL) KG was lower than the average outdoor temperature in (EM) KG during the three experiment days, the average indoor temperature in (EL) KG was higher. Moreover, the (EL) KG results were quite similar to (MY) KGs, although the average outdoor temperature during the measuring days of (MY) KG were higher by 2.4$^{O}$C to 4.1$^{O}$C degrees. Therefore, the low indoor temperature problem could be reduced by taking advantage of PS traditional buildings or by redesigning the current modern KGs by specialists to increase their insulation, which makes installing heating systems seem more realistic. Convincing KGs to install heating system in their facilities may occur by reducing the possible cost of running any future heating system, working on increasing its effectiveness and efficiency, and by raising awareness (among KG landlords) of the importance of the quality of learning environment and children's health and development. This will show them that a heating system in their KG building is not a luxury but is one of the basic requirements.

[75] For more information please retune to (Table 12)

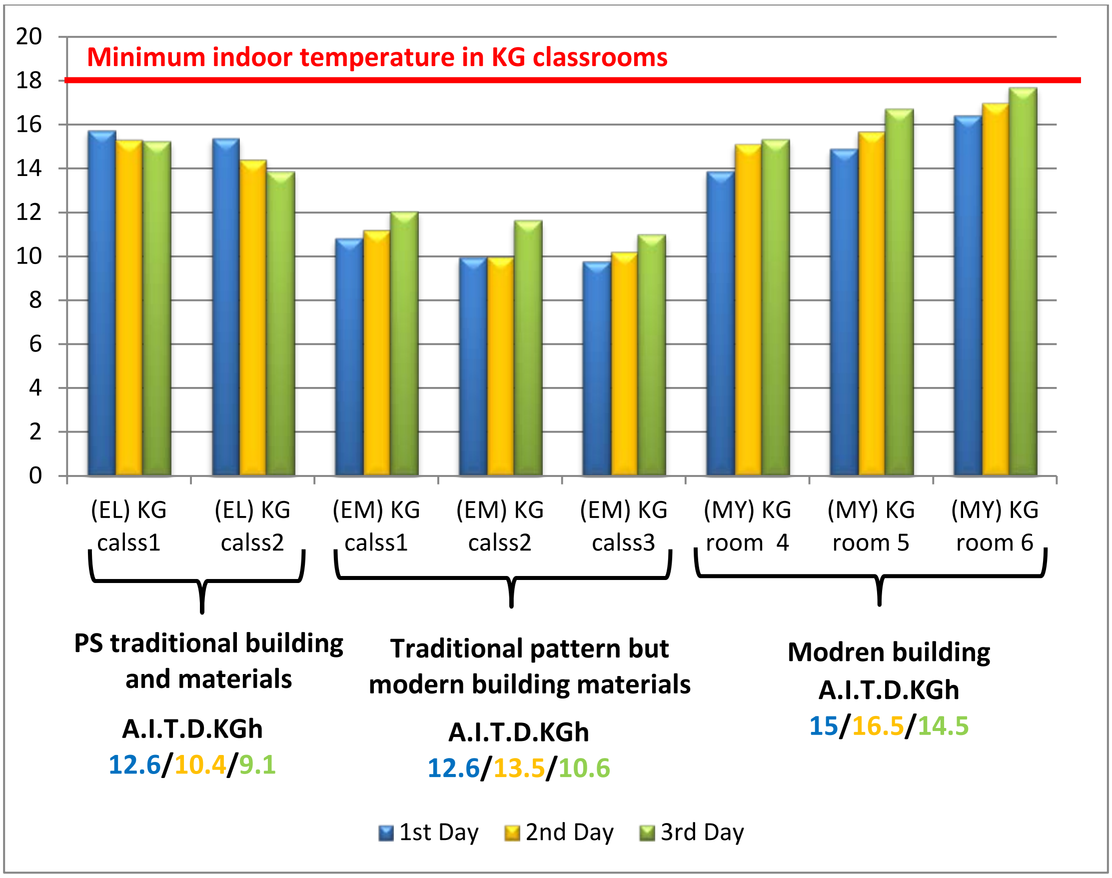


**Figure 275: The average of indoor temperature ($^{O}C$) during KGh (AITDKGh). in the three case studies in PS**

The third factor examined in these case studies was the relative humidity. Figure 276 shows that the indoor relative humidity in (EM) and (MY) KGs was at the mercy of external changes (outdoor humidity) as a result of the failure of KG structures to provide adequate protection and insulation from these factors. The indoor relative humidity in those two KGs was not only often higher than the standard limit during the KGh, but it was also higher than the external humidity levels. At the same time, (EL) KG, which was converted from a PS traditional building, shows better results in terms of this issue. Although (EL) KG exceeded the limits the majority of the time like the others KGs, at least it could keep the average indoor humidity lower than the outdoor levels during KGh (Figure 276).

The causes of the high average humidity levels in (EL) KG building are related to many factors, but it is believed that the root of the problem in all converted KGs from PS traditional buildings (Type 1) refers to three main factors: the low air flow rate, the lack of natural light and the lack of heating systems, leading KGs to adopt the idea of the closed indoor environment to provide warmth while the classrooms were crowded. In addition, the traditional pattern ‘small openings’ and use of traditional materials such as earth and lime in the thick walls exacerbated the problem. This closed atmosphere was the main reason for the low air flow rate and poor ventilation, which had a negative impact on both the indoor humidity and the concentration of $CO_2$. This problem appears mainly in winter, and it is considered one of the main disadvantages of these types of buildings. However, the same problem has a positive impact in the summer months when the high relative humidity works on improving the atmosphere by cooling it through the cold moisture emitted from the traditional thick walls. It should be pointed out that because the KGs follow the school timetables, the KG cannot benefit from this practical advantage as they have summer vacation in these hot months (15 Jun- 15 Sept).

The reasons for the average indoor relative humidity being over the limit in the modern buildings may refer to the poor insulation structure and the absence of any heating systems. This explains the convergence outcomes between internal and external readings of average humidity levels in these modern buildings (Figure 263-266) (Table 37).

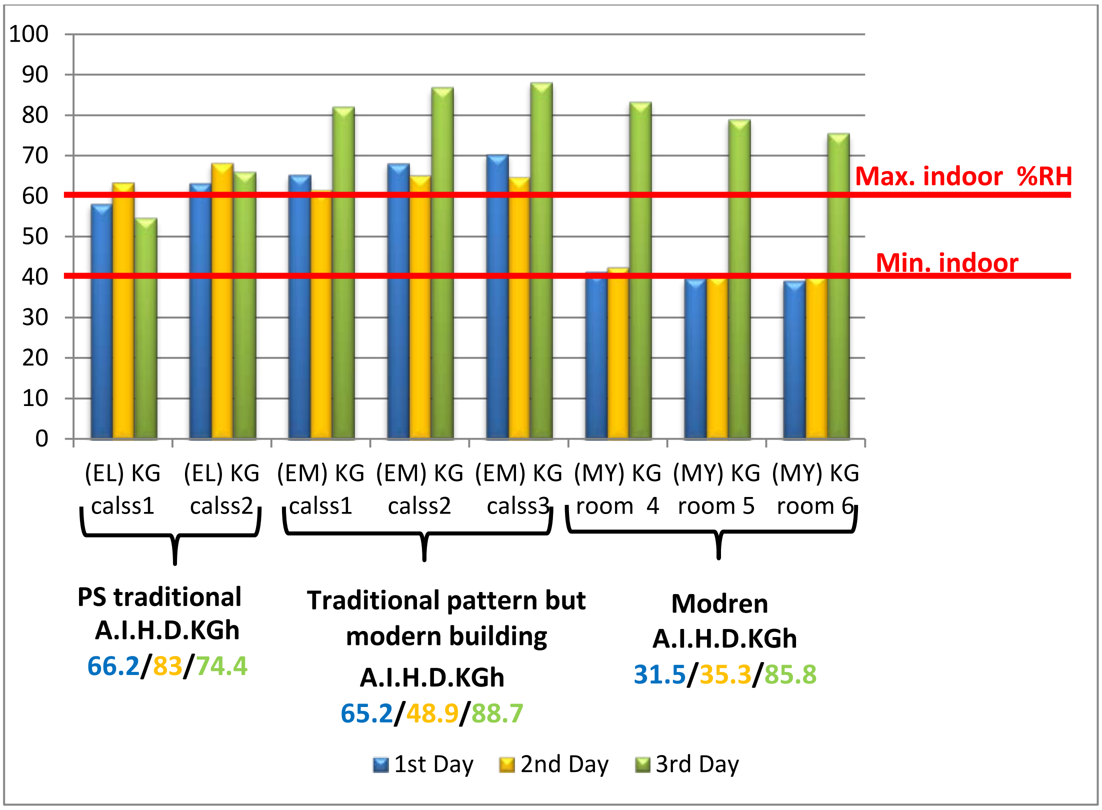


**Figure 276: The average of indoor humidity (%RH) during KGh (AIHDKGh) n the three case studies in PS,**

Regarding the concentration of $CO_2$, the case studies show that all KGs have suffered from periods of high levels of $CO_2$. These figures show levels which could constitute a direct threat to the children's lives, could have a direct negative impact on their health and an indirect impact on their performance. The figures exceed 3.3 times the maximum limit of $CO_2$ concentration in the air (Figure 277). It is believed that the high levels of $CO_2$ were as a result of the complete absence of heating and ventilation systems, which led to trying to maintain the indoor temperature by keeping openings (windows) closed as much as possible.

It should be pointed out that the KG, which was been converted from a PS traditional building (EL KG), showed the lowest overall $CO_2$ concentrations during the KGh in the experiment days between 22 and 27 Dec 2011. Moreover, it could maintain the level of $CO_2$ below the maximum limit of $CO_2$ (1,000ppm) on 26 and 27 Dec.

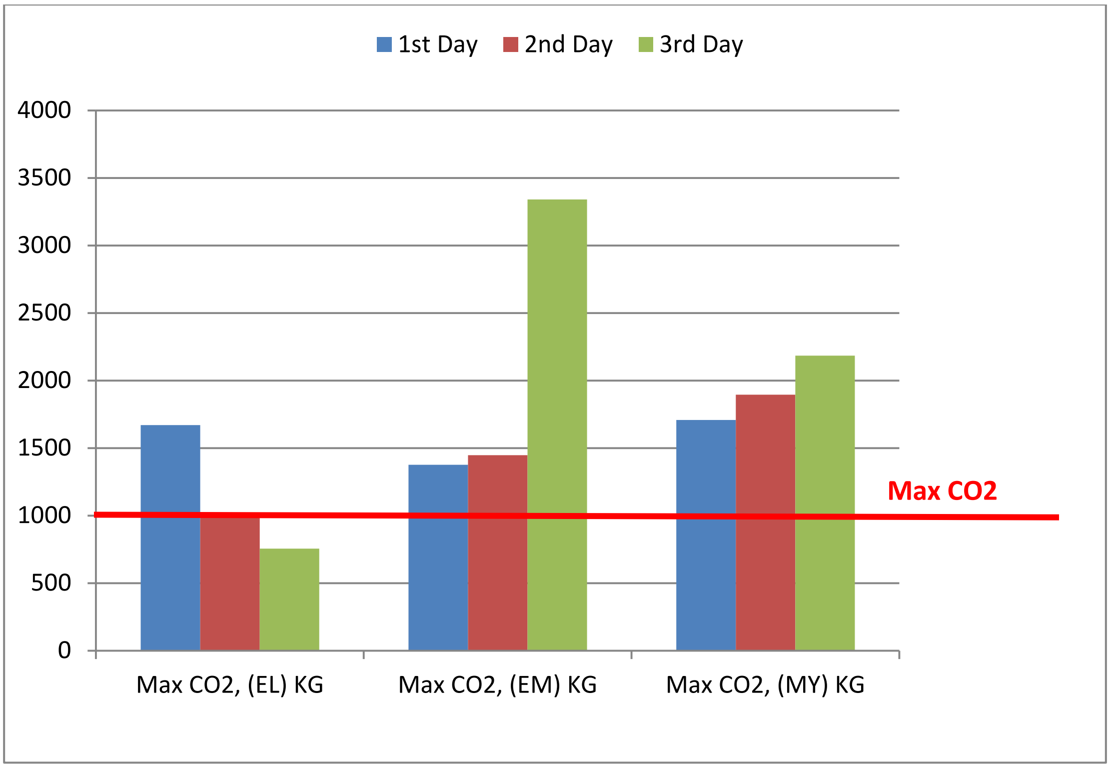


**Figure 277: The maximum concentration of $CO_2$ in the three case studies in PS, during KGh.**

However, this study has pointed out that the concentration of $CO_2$ could easily be much higher, when the outdoor temperature gets close to zero in the winter. This will cause the KG to transfer all KG activities to inside the KG building, and also keep their children inside during all KGh without any chance of renewing the interior air with fresh air by opening windows or any kind of vents. During these case studies the relationship between the outdoor temperature and the concentration of $CO_2$ inside KG buildings has been clarified. Thus, if the $CO_2$ limit was reached 3.3 times, while the outdoor temperature was around $14^{O}$C, this raises the question of what levels the $CO_2$ may reach when the outdoor temperature becomes close to $0^{O}$C.

### 6.7.1. General notes from the previous case studies:

- A lack of maintenance is considered a big issue in all cases included in this field study. This problem is clear, for example, in children's outdoor games and lavatories.
- KGs in this study do not take into account the scale of the child in many cases, such as the scale of stairs, sinks and lavatories, which are not designed for the use of the child.
- There is a lack of attention to the rules of public safety; this is reflected in the neglect of recharging the fire extinguishers (if any) which have been used or have expired. In addition, the negligence of contents of first aid kits (if any) and the repercussions of this lack show the extent of this problem.
- KG facilities neglect the needs of the physically-challenged, especially wheelchair users. The entrances, hallways, bathrooms, handles, doors, emergency exits, outdoor play areas, and water outlets are not installed or prepared for this category of users. This may explain the failure to record the acceptance of any physically-disabled students in these early educational facilities. It is believed that the reluctance of parents to send their children to these KGs occurs as a result of the difficulties that will face their children in such facilities. These buildings are not ready to receive their children or deal with their needs and aspirations. It is noted that the failure to prepare these facilities for the physically disabled was a result of a lack of experience from local workers/contractors to fulfil KGs needs, and a lack of awareness of the importance of this group. The field study has recorded a case where a KG was granted good financial support as a part of the the Qatari grant project, which aims to develop the learning environment in early education facilities in PS. This KG has been renovated and redesigned under full supervision by the landlord of this KG. This KG has not been built or initialised in any way to serve any disabled people, although the landlord of this KG, who is also its director, has a motor impairment that covers 70% of the body according to an official medical report. When she was asked directly about the reasons for ignoring such a vital issue, especially in her case, since she has enough money to do so by following simple steps such as

installing ramps, simple door handles and special lavatory kits for wheelchair users, her answer was: the lack of experience in the local job market and the local workers/contractors was her biggest problem in solving this issue. This highlights part of the problem that KGs are suffering from these days in PS. In addition, this shows again how the lack of money is not always the real problem and also how the lack of awareness could be more important in many cases.

- There is no doubt that there is a lack of access to drinking water that must be installed for use by children. The shortage occurs because the majority of the drinking equipment is damaged or has become unusable.
- Since the establishment of the KGs they have not been exposed to any surprise visits for inspection or random checks. Generally, they were only inspected when KGs were licensed for the first time, and they could be checked again only if a KG asked the ministry about adding extra rooms.
- Although the licence must be renewed annually, it should be pointed out that there is no kind of field check for the facility when it asks to renew its licence.
- When a KG asks for a licence for the first time, the ministry asks them, for example, to provide a fire extinguisher, outdoor shade above the games area, sand in the outdoor area and a first aid kit. However, after installing these, and the investigators has visited the KG and granted them a licence to open the KG, some of them will return equipment such as the first aid kit and fire extinguisher to the sellers and ask for a refund! This occurs as a result of a lack of awareness and because of the absence of field checks. This, for example, can clarify the high rate of expired extinguishers at KGs (see the first pilot study findings in 2009).
- KGs do not refuse to register any new student because of the capacity that is limited by the ministry. They usually exceed numbers limited by the ministry if they have the chance to do it.
- Some fully-licensed KGs have no shaded area, although it is considered a vital condition to grant them a licence.
- Some fully-licensed KGs have no kitchen (see the second case study).

- Some KGs have an empty first aid kit box, or the majority of medicines in these cases are expired. The same situation happens with fire extinguishers.
- There are not enough lavatories for children's use
- The majority of toilet kits do not meet the requirements of children's use

6.7.2. Common unapplied regulations

The (EL/EM/MY) KG bypasses the current PS regulations (2010) on many points, ignoring meeting the below items which are:

| | | (EL) KG | (EM) KG | (MY) KG |
|---|---|---|---|---|
| | Case study number | 1st | 2nd | **3rd** |
| Item No. | General regulations | | | |
| 4. | Each activity must not exceed 30 minutes | X | X | X |
| 5. | There is no homework. | X | X | X |
| 6. | There are no exams or marks, but there is feedback for assessment. | X | X | X |
| | A) Indoor | | | |
| 4. | The building should be well-lit, have good ventilation and appropriate lavatories that meet the engineering and health requirements. | X | X | X |
| 5. | The KG building should be detached and have its own entrance, lavatories and its own outdoor play area. | X | √ | X |
| 7. | The corridor is not allowed to be used as a classroom. | X | X | √ |
| 8. | The KG building should have a proper kitchen | X | X | √ |
| 9. | One lavatory per 20 children, or fewer. | √ | √ | X |
| 10. | The lavatory should fit to a child's scale | X | X | X |
| 11. | There should be proper water outlets for drinking that are fit for a child's scale and should be installed far away from lavatories. | X | X | X |
| | B) Outdoor | | | |
| 2. | At least 25% of the outdoor area should be shaded. | √ | √ | X |
| 5. | It is prohibited to install a manhole in the outdoor play area | X | X | X |
| 6. | Part of the outdoor area should be used for planting flowers (not available) | X | √ | √ |

contd.…/

| Item No. | Case study number | 1st (EL) KG | 2nd (EM) KG | 3rd (MY) KG |
|---|---|---|---|---|
| | The KG furniture and equipment | | | |
| 4. | A cupboard without handles for each child to store her/his personal belongings; in addition, each cupboard must have a hanger for their coats. | X | X | X |
| 6. | Part of the multi-activity room should be covered by carpet. | X | X | √ |
| 7. | Administration office and library should be furnished. | X | X | √ |
| 8. | The kitchen should have the necessary appliances, cupboards and tap water. | X | X | √ |
| | The outdoor toys in KGs | | | |
| 2. | The outdoor toys should be secure and safe. | √ | X | X |
| 3. | They should be made of fiberglass and meet the safety requirements | √ | X | X |
| 3. | Taking into account keeping at least 3m between one game and another. | X | X | X |
| 4. | Three-wheel bicycle, small trolleys for children's use and other suitable toys. | X | X | X |
| 6. | Gardening tools that are appropriate for children | X | X | X |
| | Methods of protection and safety in KGs | | | |
| 1. | Each KG must have fire extinguishers. | √ | X | X |
| 2. | Each KG must have a first-aid kit that has a collection of all necessary supplies and equipment for use in giving first aid. | √ | X | X |
| 4. | KGs should be free of obstacles such as barbed wire and stairs. | X | X | X |
| 5. | KG gates and walls should be safe and secured. | X | √ | X |
| 7 | In case the KG wall was too low, the KG should have a fence for protection. | X | √ | √ |
| 8. | Safe electric sockets should be installed at a high position | X | √ | X |
| 9. | All sorts of stairs should have a handrail, regardless of the number of these stairs | X | X | X |
| 10. | The main entrances must have barriers in front of them for protection. | X | X | X |
| 11. | Each KG should have more than one entrance to be used as an emergency exit | √ | X | √ |

**Table 39: Table shows the missing items that KG in this case study could not meet in terms of the current PS regulations, 2011**

### 6.7.3. The practical principles for KG design, which could be still missing in PS KGs

1. Health and safety comes first within the KG design process
2. Take into account the ergonomics of the child's body
3. Learning while playing in a KG environment
4. Design the 'heaven on the earth' that designers themselves would have loved to have had in their childhood, while making children feel at home
5. Equal opportunities for people with disabilities: children, parents and KG staff
6. KG design must cover all key players' needs, starting with children

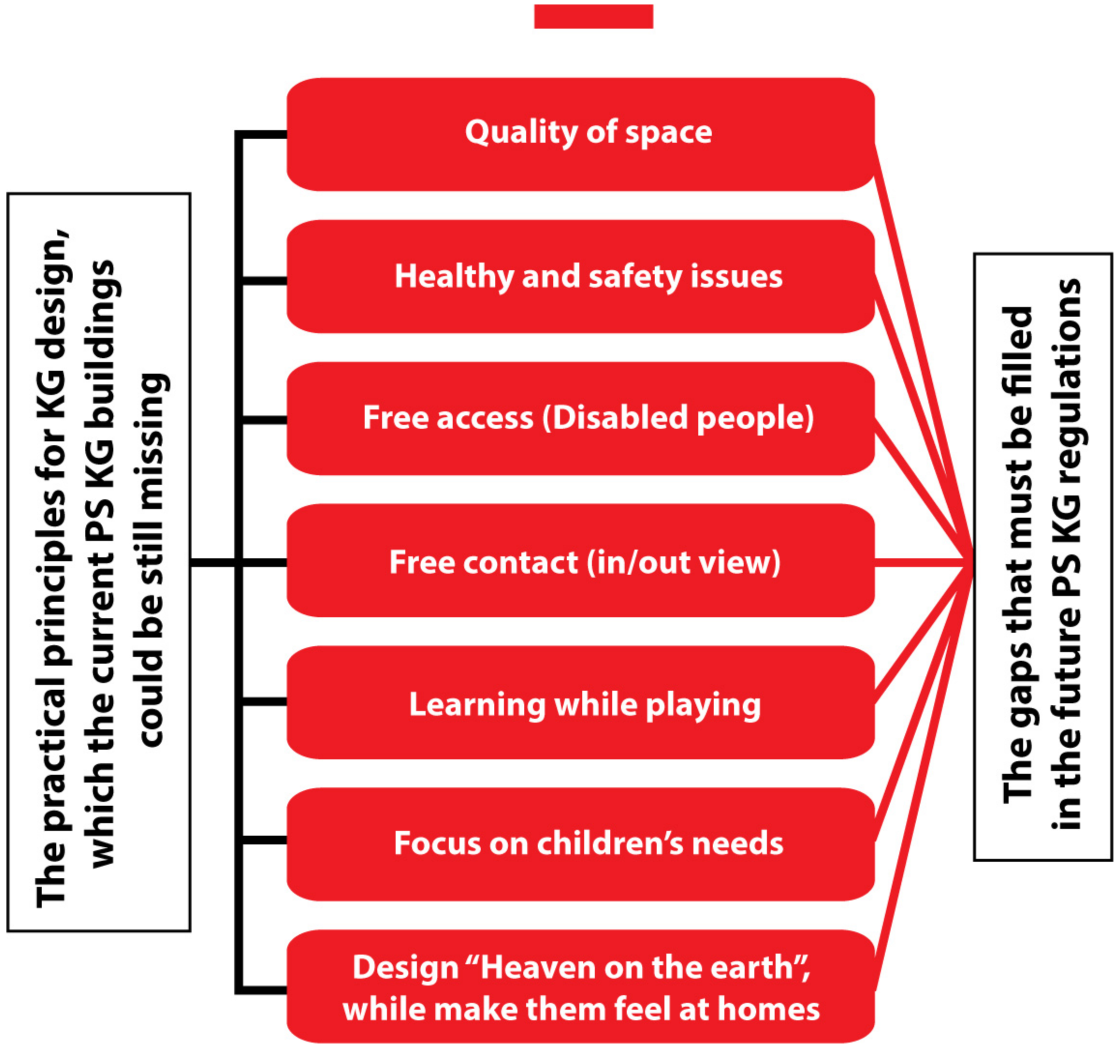


**Figure 278: The practical principles for KG design, which could be still missing in PS KGs. Based on the previous PS KG case studies**

## 6.8. IN CONCLUSION

The three KGs in this case study could not meet the minimum requirements of quality of space in terms of the amount and the distribution of light, the concentration of $CO_2$ in the air, indoor temperature and relative humidity. Moreover, regarding the relationship between the outdoor play spaces and indoor play spaces the three cases could not meet its requirements, while the visual contact between the KG environments in this study and their surrounding environment remained a subject of concern.

In addition, all KGs share common problems, such as all participants showing a shortage of storage areas for children's personal belongings. KGs' timetables show that all KGs have the kinds of activities that exceed 30 minutes, homework and exams. All these tasks are forbidden by the current PS regulations as also they required special equipment and design to meet their needs. Moreover, KG entrances in these case studies do not have barriers in front of them for protection; the majority of their stairs do not have handrails; each one of them has at least one kind of obstacle such as barbed wire and stairs; all of their toys have a problem that is related to their maintenance work, design, materials or their location within the outdoor play area; all KG outdoor spaces have at least a manhole in the outdoor play area; they do not install proper water outlets for drinking purposes that are fit for a child's scale; all participants showed a degree of negligence in the management and maintenance of the place; none of them have heating or alarm systems; finally, none of them are ready yet to receive or serve wheelchair users. In brief it all of these points are related to a lack of: maintenance and management; safety requirements; quality of space; and freedom of access and movement, especially for wheelchair users.

All previous factors are necessary for covering the building users' needs. Thus, it is MOHE's responsibility to enact laws and regulations, provide tools and establish the appropriate mechanism of application to achieve these aims for an active, safe and healthy learning environment. In addition, it is the KG's responsibility to work with MOHE to achieve success by following these regulations, and take action to apply them for the benefit of all parties.

It can be concluded from the three PS case studies that the KGs that were converted from PS traditional buildings have more valuable features than the KGs that converted from modern buildings. These features are related to the PS cultural heritage, harmonious environment, eco-friendly design, their geographical location, their ability to offer rapid economic solutions, and their ability to offer a higher quality learning environment provided they have been modified well by specialists in this field.

At this stage, general recommendations can be highlighted, which are key solutions to all converted KG buildings in PS. These key solutions should be taken into account before working on the enactment of KG building regulations, and KG designing that includes converting the current buildings to KGs or their refurbishment/developing process:

1. Focus on users' needs
2. Children's health and safety comes first at all times
3. The cost factor (installation cost and maintenance cost)
4. Energy efficiency
5. Green alternatives, such as natural light for lighting and solar energy for heating
6. Availability of trained local expertise for installation and maintenance, and availability of training for local workers
7. Provision of equipment in the local market supplied at prices fitting the purchasing power of these KGs
8. Preserving the architectural features of the PS traditional building
9. Re-designing the modern learning environment to reflect PS cultural heritage
10. Take into account the difficulty of converting PS traditional buildings to KGs as a result of the technical hitches they may face during modifying the buildings' structure. For instance, such problems may appear because of the nature of materials that have been used in their main structure and the thickness of the walls, especially the exterior walls
11. The difficulty of internal electrical installations should be taken into account
12. The minimum standard of the quality of space and their requirements should be upheld

Addressing the heating system issue may resolve the interconnected problems of low indoor temperature, high levels of indoor humidity, and the concentration of $CO_2$. stone' because it is believed that the low indoor temperature, the high levels of indoor humidity and the concentration of $CO_2$ are linked. However, at the same time, designers should keep in mind the poor economic situation in PS. It is believed that the heating issue can be solved by reducing the running cost of these systems by: working first on reducing the heat loss though insulating the buildings and stopping the air leaks; depending more on solar energy and daylight; using alternative fuels[76]; increasing the efficiency of heating systems and afford them in reasonable prices by the local government, MOHE, the non-profit associations or whom it may concern.

In addition, it is recommended to take advantage of PS traditional buildings by modifying their structure, to avoid the drawbacks and achieve the maximum benefits of their features, especially with the absence of laws that protect such traditional buildings from collapse, demolition and removal.

Regarding MOHE, it is believed that it needs to tighten controls on KGs. It is believed this could be achieved through the allocation of a special section in the ministry, whose main responsibility should be the supervision, follow-up and licensing of early education centres. In addition, the early education facilities should be run by a separate section in MOHE. In other words, KGs should not be attached to the public schools for the many reasons that make KGs unique in their nature, needs and problems, especially because of the unique role that MOHE plays towards them in terms of support and supervision. As a final point, MOHE should begin to provide training courses designed to raise awareness of these problems. Such courses should aim to identify and demonstrate the impact of these problems on the child (the quality of space), which will make applying the future regulations more than just following the written laws/orders.

[76] The waste left after olives 'Gefet' are pressed to create rolls of fuel, which offer two and a half times more heat than traditional wood fires, because 'Gefet' still rich in olive oil. In addition, it is considered a cheap alternative for heating. In 2008, 6kg of dried remains (0.9$) provide 12 hours of heat that was equal (20$) of gas (Khafaji, 2008) (Alaqralh, 2012) (Bataineh, 2011). 'Gefet' is available in PS as a result of the widespread nature of the olive oil industry.

# Chapter 7 : THE STUDY RECOMMENDATIONS

## FIRST: THE FUTURE REGULATIONS OF LICENSING PS KGS (DESIGNERS)

The future regulations must be based on PS children's needs and meet KGs' aspirations towards improving their facilities. These regulations should not be imported from the west or the east but should be generated from among the PS community to cure the core problem and reach their aims. It will be vital to deal with the most essential issues first that interest the key players in this study. The consequences of military occupation and economic difficulties experienced by the KG sector are the major challenges the must be handled by the KG designers. Designers cannot stop the military occupation or cure the poor economy of PS but a clever design can reduce the impact of both of these and achieve the aim of designing KG facilities by circumventing these difficulties and avoiding their effects as much as possible.

Safety and health should be the first item in KG building regulations. Specialists should keep looking at better ways to achieve this aim; even if the cost is high, it is believed that the cost of injuries or losing one child is immeasurable It should be the MOHE's duty to seek the best available and affordable alternatives from the local environment (local market), which can meet the safety standards.

## 7.1. DRAWING THE FIRST DRAFT

Guidelines for PS KGs based on the study. The first phase will draw the preliminary drafts of the future PS KG building regulations, which must: take advantage of the current Palestinian buildings that carry unique principles and characteristics; learn from international advanced KG building designs and projects (international criteria); and benefit from the universal principles of KG building regulations, which is a vital phase before focusing on the missing principles in the current PS KG buildings (customers problems and needs) (see Figure 279).

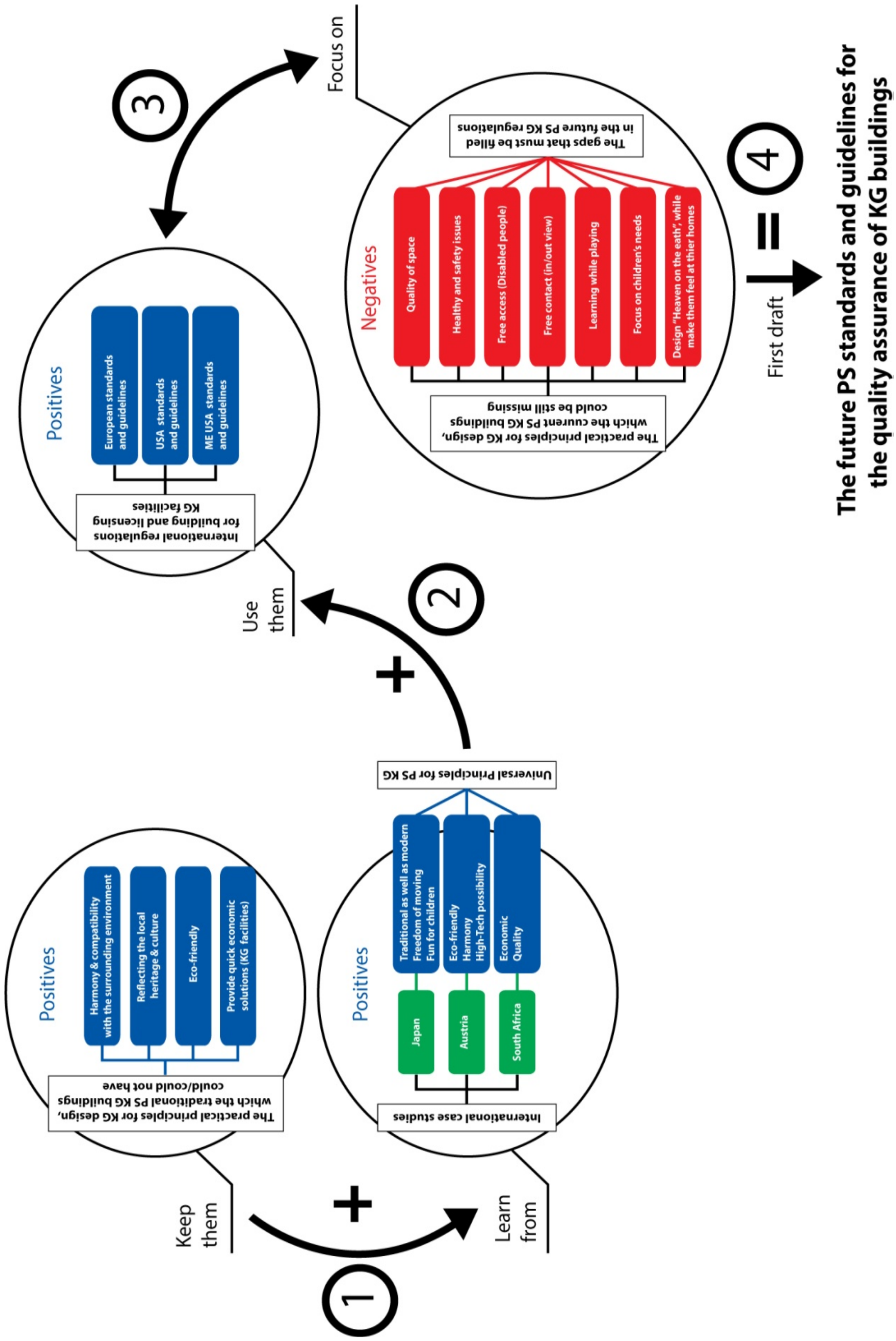


Figure 279: The methodology of drawing the first drafts of the future PS KG building regulations

The second phase will discuss the preliminary drafts with MOHE, KG landlords and staff, and parents in order to view their opinion about these future regulations, which will work on improving them to reach their aims to develop the learning environment at PS KG buildings.

Based on the above, it is believed that the preliminary drafts should be as follows:

### 7.1.1. The quality of space

#### 7.1.1.1. General rules

- It is the KG's responsibility to create a comfortable environment for their pupils that enables them to feel pleasant and comfortable.
- It is the KG's responsibility to provide their staff with suitable equipment that enables them to test/monitor the environment quality.
- It is the teachers' responsibility to make sure that their students feel comfortable, whether physically, emotionally, or academically.
- It is the teacher's responsibility to inform the KG director/landlord if they define any children's activity area (such as classrooms) that may considered uncomfortable for any reason that could be related to the quality of space.

#### 7.1.1.2. Light and lighting

- Natural light is the most important environmental input. Therefore, KGs should depend on it as the main source of lighting and use it as much as possible, keeping in mind that light changes with the time of the day and the seasons.
- The most effective way to ensure that pupils have the maximum share of natural light is by providing KG facilities with outdoor play areas that are accessible and useable for the majority of the year.
- Children's seats should not be located in direct sunlight, which could be harmful to children's eyes.

- Sharp contrast of light and shade should be avoided inside the building. It should be noted that everything that seems too dark or too bright can scare children or make them feel uncomfortable.
- Electrical lighting systems should be used as supporting systems, where/when natural light may not reach the minimum amount of lighting requirements[77] during KGhs in any season (Table 19) (Table 40).

| Lighting Levels | | | |
|---|---|---|---|
| Place | Activity | Area | Minimum (lux) |
| KG | Casual seeing | Corridors, toilets and stores (general lighting) | 100 |
| | | Stairs | 150 |
| | General tasks | Playing areas, entrance halls and dining rooms | 150<300 |
| | Visual tasks | Reading, writing and drawing spots | 300<500 |

**Table 40: The minimum amount of light inside KG buildings**

- The electrical lighting systems should save energy with low consumption. KGs must look for an alternative lighting system to reduce energy consumption and running costs.
- It is important to use an electrical lighting system efficiently. In order to achieve this, automatic switches and lighting control through lighting sensors and movement can be a useful way to save energy.
- It is recommended to install electrialc light equipment in places where staff could replace and fix them easily.
- Each KG should make sure that its electronic lighting system is in good condition and ready to use immediately (good maintenance)

[77] The amount of light should fit the type of activities which are going to occur in the classroom.

- All electronic lighting systems should be safe-touch, tough and waterproof; otherwise they should be installed well out of children's reach.
- Each KG must install an emergency lighting system to provide sufficient illumination as needed, such as in the event of a failure of electricity supply. Moreover, the building must be enabled to be evacuated quickly and safely (London's Global University, 2009).
- In KGs all fire exits, escape routes, lavatories, classrooms and also any corridor without windows (panic areas) should be provided with emergency lights.
- According to the fire precautions (Workplace) regulations 1997, these devices should not only illuminate the escape pathways, but also reveal the fire fighting equipment, fire alarm call points, and escape signs. These devices must not only be installed by specialists in emergency lighting systems, but also have appropriate maintenance and be tested regularly (Standards UK, 2008, p. 442).

#### 7.1.1.3. Classroom climate (heating and thermal performance)

- KGs should depend as much they can on using natural methods of heating, which would not only conserve fossil fuels and reduce pollution, but re-establish the human relationship with climate cycles such as solar energy, which is a renewable resource, and can be useful to support both lighting and heating methods in KGs.
- KG building should be designed to have the ability to avoid overheating in summer and overcooling in winter.
- KG buildings must be well insulated in order to reduce heat loss (Orlowski, et al., 1997, p. 23).

- It is recommended to use sunblind devices, insulate KG walls, paint roofs white to reduce the sun heat, and sometimes use mechanical ventilation[78].
- All heating devices should be safe-touch, otherwise all exposed radiators and pipes that can reach high temperatures (above 43$^{o}$C) should be installed well out of children's reach.
- All cooling devices should be safe-touch; otherwise, all exposed fans should be installed well out of children's reach.
- All radiators should be monitored to ensure that their surface temperatures do not exceed 43$^{o}$C, and it is also recommended to use radiator covers which protect children from direct contact with hot radiators.
- It is forbidden to ignite firewood inside the rooms or use coal for heating.
- In winter, each room that is used for the indoor activities of KGs should be heated during work hours until it reaches the appropriate temperature for each area.

| **Area** | **The minimum temperature**[79] |
|---|---|
| Area where there is a normal level of physical activity associated with teaching, or private study | 18$^{o}$C |
| Area where there is a lower than normal level of physical activity because of sickness or physical disability including sick rooms and isolation rooms | 21$^{o}$C |
| Area where there is a higher than normal level of physical activity such as gym | 18$^{o}$C for children only (15 for adults) [80] |
| Non-teaching areas | 16$^{o}$C |

**Table 41: The minimum temperature requirement inside KG buildings**

[78] They should be quiet because some of them may increase the background noise. In addition, they should be installed far away from children's touch because some of them could be dangerous for children if they are reachable.

[79] When the external air temperature is -1$^{o}$C (NUT, 2011)

[80] Based on the WHO report, the comfortable indoor temperature degree is between 18 $^{O}$C - 24 $^{O}$C and it should not exceed 3$^{O}$C below the recommendation degree at sitting level (0.6m) and on standing level (1.2m) (WHO, 1987)

- In summer when the heating system is not used, the recommended temperature for all interior areas should be approximately 23$^o$C during normal days.
- The inside temperature must not exceed 28$^o$C (Orlowski, et al., 1997).
- The users of this equipment should have enough knowledge of how they should deal with heating/cooling systems, so providing manuals for staff could be helpful to ensure that the heating system is running correctly. In addition, they may need to exercise a certain amount of control.

#### 7.1.1.3. Ventilation

**A) The concentration of CO**

- All KGs should install a CO monitor/alarm[81] that meets the requirements of the current UL 2034 safety standard[82].
- The maximum exposure in the KG facilities in KGh is 25ppm CO (OSHA) (CPSC, 2007).
- It is recommended to evacuate the KG building if the concentration of CO reaches 70ppm or above (CPSC, 2012).
- Never burn wood/charcoal inside the building.
- Never operate fuel-burning appliances in any classroom where pupils are sleeping.

**B) The concentration of $CO_2$**

- All KGs should install a $CO_2$ monitor/alarm.
- It is recommended to keep the concentration of $CO_2$ below 800ppm inside the KG buildings.

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[81] KGs make sure appliances are installed and operated according to the manufacturer's instructions and local building codes. It should be noted that the majority of devices should be installed by qualified professionals.
[82] UL 2034, the Standard for Safety of Single and Multiple Station Carbon Monoxide Alarms

- The maximum concentration of $CO_2$ in KGs is below 1,000ppm, whereas the recommended amount should be below 800ppm (ASHRAE, 2002).
- KGs should act immediately to reduce the concentration of $CO_2$ in the indoor air of KG buildings when it reaches 3,000ppm[83] by turning air vents, opening windows and doors to let the fresh air flow.
- Vacate KG building when $CO_2$ reaches 5,000ppm.

**C) Relative humidity**

- All KGs should install a thermometer and relative humidity monitor/alarm[84].
- The relative humidity in indoor environments should be between 40%RH and 60%RH (Arundel, Sterling, Biggin, & Sterling, 1986) (Baughman & Arens, 1996)[85].
- In an indoor KG environment, it is required to provide three litres of fresh air per second per person as a minimum standard in the winter season,[86] whereas the typical ventilation rate is between four and six litres of fresh air per second per person (Orlowski, et al., 1997, pp. 16, 30).
- Any sign of mould[87] must be taken seriously and removed as quickly as possible.

**7.1.1.6. Relationship between inside and outside**

**View and the relation to nature**

- KGs should create a strong relationship (link) between the internal spaces and the surrounding environment.

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[83] In the presence of normal oxygen

[84] KG may install one device only (all-in-one), which monitor/alarm thermometer, relative humidity, $CO_2$ and CO level at the same time.

[85] A well-ventilated building can reduce the humidity and CO in indoor environment.

[86] Assuming an external temperature of -1$^{o}$C

[87] See physical evidence peeling paint walls and stains on a wall... etc.), notice its symptoms (see page 182) or smell mould odours.

- The interior spaces should reflect the surrounding environment.
- KGs should provide a high level of access to outdoors.
- KGs should work as much as possible on breaking the barriers between inside and outside[88], taking into account the security and safety factors in the facility.
- In classrooms children should have eye contact with the outdoor environment (outdoor play area)[89].
- In the outdoor play area children should have eye contact with the surrounding environment.
- Openings (high windows, windows with curtains and wooden doors) should not be a barrier to children having eye contact with the surrounding environment, and all classrooms should install some windows at the children's level.

### 7.1.2. Security, health and safety

#### 7.1.2.1. Security of location

**A) KGs should not be built or located in the following places:**

- In valleys where seasonal floods could cause a direct danger to children and staff, especially if the location is near a water route.
- Close to rivers or any wetland, so there should be enough distance between KGs and rivers to avoid flood dangers or collapsed soil (at least 33m).
- In the vicinity of any dam shade, where there could be danger for children and staff if any accident or floods occur.
- Close to any active volcano areas or any unstable lands.
- Near any kind of pollution including noise pollution, air pollution, water pollution, or radiation areas.

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[88] Using glass and natural materials may help.
[89] Installing wide sliding doors, windows, shutters and vents help children to keep in touch with nature.

- Near military sites (military bases, barracks, training facilities, weapons storage areas and heavy equipment storage).
- Near “hotspots” (near Israeli settlements, the Separation Wall, or fixed military checkpoints).
- Industrial areas.
- Less than 50 metres from any gas station.
- Less than 20 metres from any petrol station.

**B) The KG location should be:**

- Far away from a highway, with a distance of not less than 50 metres.
- At a distance at least 50 metres between itself and a wide crossroad.
- On two roads, one of which should be not less than 20 metres wide.
- The KG should avoid using a multi-levelled site location; sites should have a flat plane[90].

**C) Security of building**

- KG should have only one access main gate to outside and one controlled main door[91] in order to ensure that children cannot leave the facility without an adult’s permission.
- The main entrance should be designed to prevent all unwelcome people from accessing the building (NCNA, 2009).
- Children’s outdoor play area should be fully enclosed, while still allowing children to play in plenty of sunlight and fresh air. Keep in mind that children should have eye contact with their surrounding environment.

[90] In case if a KG building is comprised of two floors, the ground floor should be devoted for children while the upper floor is devoted for the use of the KG staff only, or may be used as supported area such as storages, offices or meeting rooms (not for children’s use).
[91] Add to the emergency exits.

#### 7.1.2.2. Health

- KG flooring should be easy to clean and maintain.
- KG flooring, furniture and painting surfaces must be non-toxic and unleaded.
- All frequently touched toys should be cleaned daily and other toys and materials cleaned weekly.
- Indoor environmental surfaces associated with children's activities, such as table tops, should be cleaned and disinfected when they are soiled or at least daily (WHO, 2007).
- A first-aid kit should be provided. It should be kept in a clean container, out of reach of young children.
- The first aid kit should be maintained each academic year, and should be restocked after each use. Inventory should be conducted monthly.
- Teachers should be trained to provide emergency first-aid in case of need.
- Garbage receptacles should be of adequate size, covered, emptied daily and cleansed after emptying. Trash or garbage should not be stored in rooms ordinarily occupied by children.

#### 7.1.2.3. Safety

**A) General rule**

- Child's safety comes first and before anything else in a KG facility.

**B) Drop-off and dismissal time safety**

- KGs should have enough space (parking/zone), which should be close to its gate, for dropping off and picking up children at dismissal times.
- Cars must not be allowed to park in front of the KG gate.
- All KGs must have a wide pavement/footway in front of the building and at the drop-off/pick-up zones

- There should be a fence or barrier to prevent children running across the road, especially where the risk of an accident with a car or other road user is extremely high.

**C) Play area/classroom safety**

- Children should have ability to play under supervision in safety.
- No touchable wires, pumps, engines, supplies, hot pipes, glass, sharp rocks, twigs, or harmful plants[92] should be located in the outdoor/indoor play areas.
- Any glassed area accessible to children should be safety glazed or effectively guarded by barriers.
- Children's fingers should be protected by using a door guard/finger shield[93].
- All sharp corners inside the KG building, especially those are located in children's activity areas, should be rounded or covered by a corner guard (soft edge bumper).
- All electrical outlets that are accessible to children should be child-proof or should be covered with child-resistant covers.
- In indoor spaces, all windows above the floor level should be designed or adjusted to limit the exit opening accessible to children to less than 15cm; otherwise it should be protected with guards that do not block outdoor light.
- All furniture should be made of soft materials to minimise the chances of accidents.
- It is the KG's responsibility to make sure that children's furniture, equipment and toys meet the current safety standards.
- KG furniture such as storage cabinets and shelving must be stable and secured to the floor or wall to prevent danger from tipping over.
- Equipment such as TVs and PCs must be secured to walls or tables to prevent them from falling on children.

[92] Toxic plants, plants with sparks, or plants with fallen fruits that may cause a choking hazard or allergy
[93] Finger protection for the front of a door/both sides of a door

- Equipment should be sturdy and free of sharp points or corners, splinters, protruding nails or bolts, loose rusty parts, hazardous small parts, or paint that contains lead or other poisonous materials.
- There should be no pinching, crushing, or shearing points on or underneath equipment that would be accessible by children.
- No hard surfaces (such as asphalt and concrete) should be located under/around outdoor play equipment[94] because these have poor shock absorption.
- Outdoor play areas should be well-designed with impact absorbing materials[95] that are comfortable and reduce the risk of injury.
- Indoor flooring should be covered by carpet, vinyl or rubber[96], which has some ability to cushion children from falls while running or playing.
- The indoor floor surfaces should be adequately slip resistant, easy to clean and safe to use.
- All stairs used by children (on a daily basis) should be equipped with age appropriate height handrails and non-slip materials.
- All pieces of playground equipment should be surrounded by a resilient non-combustible surface.
- All children's toys and activity equipment should fit children's age[97].
- Swings' seats should be light and covered by soft material to reduce the shock of impact during a fall.
- Outdoor play areas should offer sufficient shade[98] covering at least 50% of the play area.
- Pesticides should not be used on or near surfaces where children play.

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[94] Unless they are required as a base for other shock absorbing materials such as rubber mats
[95] Materials that have an ultimate protection for absorbing shock from bumps and drops
[96] Should be covered with an impact resistant material
[97] Commensurate with the children's body scales and their needs (target age group 4–6 years)
[98] Include: natural landscaping, trees and/or tented structures

- Outdoor play areas should not provide shelter to pests and be kept free from rodents.

**D) Fire safety**

a. Fire prevention

- KGs should be subject to inspections and recommendations from the Division of Palestine Civil Defence.
- Each KG must install a smoke detection/alarm system[99].
- All fire detection and fire alarms should be tested once a month and maintained in good working condition. KG teachers/staff should be instructed on their functioning and operation.
- All staff should be well aware of emergency evacuation procedures, including emergency numbers and emergency exits[100].
- Each KG should have a written evacuation emergency plan (Appendix 10).
- Copies of the emergency action plan should be prominently posted throughout the facility, especially in readily accessible places (such as near entrances and in each classroom).
- An approved exit sign should be installed at each required exit doorway.
- All emergency evacuation plans should be reviewed annually.
- Flammable materials must not be stored in classrooms.
- All flammable materials and any items that may be harmful to children must be kept in locked cabinets.
- Direct-fired heater systems must not be used in rooms used by children.
- KG kitchens should be enclosed in rooms of fire resistant construction, including walls, ceiling and door frames.

[99] A smoke detection/alarm device should be installed in each classroom or office.
[100] KG staff and teachers should be trained to prepare them for a real emergency situation.

b. Fire fighting equipment

- KG buildings should be protected by an approved automatic fire sprinkler system.
- Each KG should be provided with at least one approved portable fire extinguisher (minimum 2A-10BC)[101] for each 140m$^2$ of floor space of the facility.
- The distance between any two fire extinguishers should not exceed 23m.
- Required fire extinguishers should be securely mounted in readily visible and accessible locations, with the top of the extinguisher not more than 1.5m above the floor.
- All fire fighting equipment should be maintained to be kept in a good condition. KG teachers/staff should be instructed in their function and operation.

**E) Water safety**

- KGs should be provided with enough water for children, at least 15 litres per child per day (Orlowski, et al., 1997, p. 23).
- Drinking water should be easily accessible to both staff and children.
- The temperature of all warm water taps accessible to children should be no higher than 40$^{O}$C.
- A sink with running water should be well located and readily available to every classroom.

e) General safety standards

- Peeling or damaged paint or plaster should be repaired.
- Adequate protection against insects should be maintained.

[101] (2A-10BC): this rating is assigned by UL or ULC (an independent body) as a means of measuring the effectiveness of the unit, for each class/type of fire. In this case this type is for combustible materials, like paper, wood, cardboard or cloth and weighing approximately 5lbs=2.268kg.

- Appropriate telephone numbers and instructions for calling police and medical services should be posted close to the telephone.
- Any pet or animal on the premises indoors and outdoors should be in good health, properly cared for, and suitable for young children. In addition, these spaces should be kept free of animal wastes.
- All children should be accompanied by a teacher at all times.
- All toys, books and activity equipment should conform to the standards of international safety for use by children in respective age groups.

### 7.1.3. Free access (Disabled people/wheelchair users)

#### 7.1.3.1. Parking

- On the KG site, at least one accessible route, parking space, passenger loading zone, and sidewalk should be provided to enable WCUs to access the building entrance (Table 42).

| Total Parking in site | Required Minimum Number of Accessible Spaces for WCU |
|---|---|
| 1 to 25 | 1 |
| 26 to 50 | 2 |
| 51 to 75 | 3 |

**Table 42: the minimum number of parking in KG lots that is required for WCU (ADAAG, 2002)**

- At least one WCU space parking should be served by an access aisle 240cm wide minimum (Appendix 11).
- Access aisles adjacent to accessible spaces should be at least 90cm wide (Figure 292)
- Pathways should be kept safe and barrier-free for all people.

#### 7.1.3.2. Entrance

- All exits and steps should be unobstructed and have approved ramps for evacuation.
- The main entrance should be accessible and barrier-free for wheelchair users (WCUs) but secured all the time and easy to monitor by staff (Watson, et al., 2004).

#### 7.1.3.3. Classrooms and play areas

- Playrooms should allow for use by disabled pupils and wheelchairs, for example of these facilities are ramps, door and widths.
- The minimum door width for KGs' internal doors should be 815mm with an opening angle of at least 90 degrees. Door thresholds should not be higher than 19mm in the exterior doors with no sharp edges, and no more than 12mm in other types[102].
- The doors should be provided with at least 300mm of latch side clearance or installed with an automatic door opening device complying with (ADAAG 4.13.12) and (ANSI/BHMA A156.10, 1985) standards.
- Both door latch and handle should be able to be used by one hand, and they should be operable without tight grasping, pinching, or twisting of the wrist[103].
- Interior hinged, sliding or folding doors should have a maximum door opening force requirement of 5lbf (pounds force) and exterior hinged doors should not exceed 8.5lbf (CBC 1133B.2.5.1 and ADAAG 4.13.11), whereas fire doors must have a minimum door opening force requirement.
- In the case of sliding and folding doors, if these doors are fully opened their handles should be usable from both sides with a maximum height of 1220 mm from the floor surface (Figure 301).

[102] According to item (4.13.5) in ADA Accessibility Guidelines (ADA, 2002)
[103] According to Americans with Disabilities Act (ADAAG, 1996)

- Both automatic doors and power-assisted doors should adhere to the American National Standards Institute and the Builders Hardware Manufacturers Associated (ANSI/BHMA A156.10-1985)[104].

#### 7.1.3.4. Corridors

- When there are two doors in a series, the minimum space between them should be 1220 mm added to the width of any door swinging into the space (Figure 301).
- Doors in a series should swing either in the same direction or away from the space between the doors; otherwise the space between the both doors should not be less than 2.1m (ADA, 2000).
- For lighting issue please see Table 40.

#### 7.1.3.5. Steps and handrails

- Stairs should have handrails at both sides of all stairs.
- Handrails should be continuous along both sides of stairs.
- It is recommended to install a double handrail, one for adult users and other for children. The adult handrails should have 1000mm as a maximum height whereas the children’s handrails should be of 600mm height (Figure 295).
- The minimum clear space between handrails and wall should be 38mm, and it is recommended to reach 45mm (ADAAG, 2002).
- Steps surface should be slip-resistant and kerbs and handrails should be provided wherever is possible.
- Steps should be clearly lit, and handrails should be coloured by a different colour or contrast with their background, whereas the nosing of the steps should be distinguished by colour and contrast in order to be noticed easily.

[104] These requirements include, for example, slowly opening with low power so that doors should not open to back faster than 3 seconds, and also requires no more than 15lbf to stop door movement (ADAAG 4.13.12).

- Each step should have 150mm maximum riser and between 280 to 300mm depth treads. Stairs should be 1200mm minimum wide.
- Step nosings should not have sharp edges that could injure anyone when accidently falling on them. These noses could have different shapes and designs but should not be more than 20mm (Figure 297).
- Ramps are essential for WCU if elevators or lifts are not available to connect different levels[105].

#### 7.1.3.6. Lavatories

- It is recommended that restroom doors be supplied with an automatic door closer and latches be flip-over style, with sliding or other hardware not requiring grasping or twisting (Figure 300).
- Children should feel independent with less stress on KG staff.
- Lavatories should be safe and accessible for children but easy to supervise.
- Children's privacy and security should be a concern. Thus, it is recommended to provide children lavatories with low doors that give children privacy and at the same time can be easily monitored to forward assistance when children need it.
- Children's lavatories must be accessible from classrooms, while having easy access from outdoor playrooms is considered a positive addition.
- Distancing children's areas from visitors is a significant issue.
- Cubicles should have enough space to enable staff to give help, and at least one should be provided for children with physical disabilities.
- All wash areas should be provided with automatic switches and thermostatically controlled warm water.

[105] It should be pointed out that some people who use walking aids may have difficulty with ramps and prefer stairs.

- Toilet seats for adult use should be approximately 455-475mm high (Figure 304), and installing thick seats and filler rings is recommended (ADAAG, 2002).
- Toilet, washbasin and all equipment in the children's lavatory must fit children's scales (NCNA, 2009). Toilet seats for children at the KG age group should be as follows:

| | |
|---|---|
| Water closet centreline | 30.5-38 cm |
| Toilet seat height | 30.5-38 cm |
| Grab bar height | 51-63.5 cm |
| Dispenser height | 35.5-43 cm |

**Table 43: Specifications for water closets serving children ages from 4 to 6 years (ADAAG, 2002)**

- Lavatories should be provided with a ventilation system that fits toilet size.
- Toilet areas should be kept light, clean and fresh, so tile flooring and equipment should be easy to clean[106].
- The required area for both toilet and washstand should be 12m$^2$ for each KG, then 6m$^2$ per additional classroom[107].
- The minimum requirement should be at least one flushing toilet (open seat), stationary washbowl and a low mirror for each group of 10–15 children (Watson, et al., 2004, p. 14).[108]
- Each KG needs at least one shower per 40 children and they must be separated.
- A toilet should be installed to serve staff and visitors only. Hence, it is recommended to be located in area that is close to the main entrance and reception.
- Adults and visitors lavatories must be separated from the children's lavatory.

[106] Wall hanging toilets could be one of the best ways to achieve this goal.
[107] The Education (School Premises) Regulations 1999
[108] 10-15 children per lavatory

- Lavatories for adult use should be accessible and suitable for WCU. Hence, they should be provided with heavy duty equipment and washing facilities that help to achieve this aim.
- WCU and children's lavatory doors should be able to open outwards in an emergency situation and they should be always open outwards when opposite to any other toilet doors (Figure 303) (Wood, 1999).
- Ceramic tiling should not reflect a glare, and should have a contracted colour or tone with lavatory equipment.
- Lavatory flooring must be slip resistant and made from durable materials.

## 7.2. DISCUSSING THE FIRST DRAFT WITH THE KEYPLAYERS

An-Najah National University (NNU) in collaboration with MOHE in PS, held a one-day workshop in 2012. This workshop, which was entitled 'Developing the Interior Environment of Kindergarten Facilities in Palestine', aimed to discuss the first draft of this study with a selected group of the local community. The local community in this workshop consisted of: various departments of MOHE[109]; 40 KG principals from Nablus Province[110]; organisations concerned with the early education field and childhood[111]; and some academics from the Applied Arts Department of NNU (Interior Design).

Research points addressed in the workshop were as follows:

a) Highlighting the specific needs of children in the PS KGs
b) Outlining the main difficulties that may face the KG environment in PS
c) Displaying the methods of developing the interior environment of PS KGs by using interior design
d) Reviewing the first draft of the PhD study and discussing the possibility of its benefits and drawbacks on developing the KG environments in PS
e) Discussing the best methodology of applying these recommendations
f) Discussing the proper consequences of applying these recommendations on the main players[112] and the main difficulties that may face KGs and MOHE.

MOHE nominated some organisations that are related to the KG sector, for the purpose of inviting them through NNU in order to participate in the workshop. In addition, MOHE nominated 40 directors of the KGs to participate in the workshop. Participants were selected according to the criteria set by the MOHE.

[109] General Education Department, Kindergarten Department, the Department of Special Education and Counselling, and Structures Department in MOHE.
[110] Nablus City, towns, villages, refugee camps in Nablus Province in PS.
[111] Syndicate of Kindergartens and Private Schools, Nablus Municipality, Civil Defence.
[112] Children and their parents, KG, and MOHE

These criteria were based on:

1. KG capacity (the number of children in each facility)[113]
2. KG location (city centre, towns, suburbs, villages, and refugee camps)
3. The assessment of MOHE for KGs depending on their annual activities.

NNU invited to this workshop professors who are interested in participating in the discussion and making comments on the interventions. The academic staff were from the Fine Arts School[114].

The participants focused their discussion on the initial draft plan released by the researcher. This discussion will be an important factor in highlighting the most important difficulties that may face the key players in the initial implementation of the recommendations. In addition, it will identify the most important advantages that are expected to be achieved from the application of these recommendations in the future.

In addition, the final recommendations that came from the participants in the workshop will have an important role in determining what the focus should be, and what is excluded from the preliminary recommendations of licensing KG building regulations. This will enable the study to generate the best final recommendations that can meet the Palestinians' needs and aspirations. These final recommendations will be considered as the base that MOHE can rely on in forming their own regulations in the future.

## 7.2.1. Reviewing the first draft with MOHE

### 7.2.1.1. Expected benefits

A) Creating environments that are able to raise healthy children on both mental and physical levels.

[113] Categories: <100/101<200/201<300/301<500/501<800/>800 children in each facility
[114] Prof. Hasan Inairat (Dain), Dr Hani Al-Farran, Mr Ahmad Alhajj Hamad, and Mrs Raghadah Abuzaytoun (Lecturers).

B) Reducing injuries in these KGs by creating a safe and healthy environment.

C) Generating satisfaction and acceptance from parents.

D) Increasing the enrolment rate in KGs in PS, which will lead to:

a. Increase in the income of KGs, which further leads to improving the standard of living for the owners of KGs.
b. Increase in the number of children who enrol in primary schools and join their community with more self-confidence.

**7.2.1.2. Expected difficulties**

a) A lack of a genuine desire among decision makers towards developing this sector, which would not help the new regulations to achieve their aims.
b) The lack of a clear future vision for the future of KGs in PS, which would not help to draw a timetable for the implementation and activation of these regulations on the reality.
c) Treatment of KGs as profit-making institutions in the first place by the government, like any business scheme such as in terms of taxes and limited support.
d) The absence of financial support from government and very limited support that NGOs forwarded for such developing plans, which focus on the improvement of the learning environment. The vast majority of NGOs' support focuses only on training courses for KG staff or developing curriculums

**7.2.1.3. MOHE's recommendations**

MOHE members have indicated that the following are agreed with:

a) The KG department in MOHE believes that the current regulations may be enough for this stage [115]. However, it believes that the real problem is related to:

   1. The methodology of supervision on KGs by the Structures Department in MOHE
   2. The methodology of applying the current regulations
   3. Administrative problems related to the coordination between the various agencies responsible for licensing the KGs and the safety of the buildings
   4. The lack of follow-up by the department officers.

b) MOHE suffers from a lack of specialists in licensing KG buildings and it needs a special department that is concerned with this sector and its needs. The suggested department should be provided with essential resources and specialists[116] to provide guidance for KGs and govern the relationship between all parties under one roof.

c) An independent committee should be established by MOHE, which should consist of those who have specialised in the KG field.

d) It is important to hold workshops and meetings with parents and KG principals to increase the awareness about the importance of health and safety learning environment in KG facilities.

[115] In regard to the financial condition of local government and KG districts

[116] A representative of the engineers association (KG design), municipality (child security), civil defence (child safety), kindergarten guild, Ministry of Health (child health), and Ministry of Transportation who must work under the administration and supervision of MOHE.

e) KGs need more courses about using safety equipment and first aid kits, especially for new KG teachers. In addition, all KG staff must be familiar with emergency plans and safety tips.

f) Monitoring and alarm devices that are being used to measure the quality of interior air are not affordable in the local market and are not easily obtained, in spite of their efficiency and effectiveness. In addition, MOHE believes that such devices can be indispensable for ensuring the safety of the building and following the guidance of proper ventilation of the building by KG staff.

g) They admit that the current KG regulations need more details, such as: figures, layout and illustrations can be helpful, whether in the planning or refurbishing stages. Thus, printing a handbook or guideline will be a vital issue for KGs.

## 7.2.2. Reviewing the first draft with PS KGs

### 7.2.2.1. Expected benefits

KG principals agreed on the next points:

a) The application of the new regulations leads to the creation of an encouraging learning environment for creativity and productivity for children and staff.

b) The relationship between inside and outside the building and the creation of barrier free facilities is a new idea that they are interested to see tested and applied in their facilities.

c) Although they believe that the majority of PS facilities are already applying some mentioned points that are related to health and safety issues, there is a lot to learn in this field. In addition, applying the extra regulation will be easy to achieve and they believe this will lead to a better environment for their children.

d) Increasing the income of the KGs by increasing their capacity and the enrolment of the children.

e) Creating a model KG in a highly competitive market.

f) Increases the acceptance of the local community to such KGs, which could achieve these new standards.

g) Reduces the aggressiveness of children and helps in dealing with some children's behaviour problems.

h) Increases children's interaction with their teachers and with their fellow students in KGs.

#### 7.2.2.2. Expected difficulties

KG principals agreed on the next points:

a) There is fear of the lack of suppliers, who are capable of providing the requirements for interior environments for KGs.

b) They have fears about the high cost of applying any new regulations, especially with the absence of government support for this sector. The high cost of applying these new regulations will increase the fees for parents, which may lead to reducing the total number of children enrolled in each KG or push parents to join their children for one year only (before primary school) instead of two. This may occur as a result of financial difficulties, which Palestinians face as a result of the collapse of the economy today.

c) The majority of KG facilities in PS are rented, which leads to making any modification in the building structure or its interior design needing written permission from the owners. This permission is not always easy to obtain because it puts KGs under pressure from the landlords who want to double the rental value of the property[117].

d) They have fears that creating a visual link between inside and outside the KGs would distract the attention of children and they would find it a difficult process to focus on the lessons and activities that occur inside the classroom, especially when some KG buildings are located in crowded and noisy areas. Thus, they prefer to be isolated from the surrounding environment.

e) Applying all regulations that are related to WCU need both financial support and guidance, which is lacking. Moreover, because the majority of KG facilities are rented, it will be difficult to make any modifications to the building to receive this category of children and to meet their special needs.

f) The lack of financial allocations that are available for the annual maintenance of the building and playing areas is a primary obstacle to owning a safe and healthy environment.

g) They have fears of the misuse of the new regulations if they are compounded with bad management or corruption, or if they are placed in inexperienced hands in the structure department in MOHE, which may place additional pressures on KGs.

h) They have fears about focusing on the specific details in the regulations (such as figures in the lighting tables) instead of focusing on the spirit of the new regulations. They believe this may prevent some KGs from renewing or obtaining the required licences as a result of their failure to achieve the specific figures in the new recommendations.

[117] PS law protects tenants from the raising of the rental value of the unit or eviction of the tenant unless the tenant has defaced the property or made some modification without the written permission of the owner.

**7.2.2.3. PS KGs' recommendations**

a) MOHE, and all parties who are interested in KGs and the childhood sector, should work on holding workshops and sessions with KGs and parents to increase the awareness of the main aims of KGs and the importance of the learning environment in KGs.

b) A single reference in licensing KG buildings should be given broad powers for follow-up and implementation of these regulations.

c) A joint committee should be formed, of specialists, MOHE, Ministry of Health, Ministry of Transportation, Civil Defense, Ministry of Environment, and municipality competent by the terms of public safety in KGs.

d) In licensing KG buildings, MOHE should deal with them on two bases:

    1. The current KGs that ask for licensing.
    2. The new KG projects that are looking for licensing.

e) MOHE should draw up development plans for existing facilities to achieve the new requirements, while preventing licensing of new KGs until they meet its regulations.

f) The importance of modifying the space requirement for each child depends on the location of the KG and the needs of the area in which it is located.

g) Applying some of the points, which are mentioned in the new regulations, must be linked with the improvement of the economic situation.

h) MOHE has a duty towards KGs to take the lead of these recommendations, which have been mentioned in the workshop, and study the best way to activate them.

i) There is a need to focus on lighting issues (the quality and the amount of light) in their facilities. In addition, they indicate the importance of awareness for public safety in terms of fitting lighting systems.

j) More awareness and experience is needed in ways to exploit the natural light in their facilities.

k) They would like to present the new regulations to KGs in order to take advantage of them, whilst being approved by decision makers.

l) Application of these new regulations should be gradual, over several years.

m) KG facilities should be licensed especially to serve WCU, because the current KG facilities are not ready to receive them and cover their needs.

n) Barriers on front of the KG gates, which are required by the new regulations to be installed to protect children from the highways and the main roads, could hinder the movement of children to access the buildings.

o) The relationship between inside and outside the building should not be applied to all KGs because they see that it could not be achieved in some cases. Thus, they think that this item requires more discussion and study before they approve it.

p) The existing KG building regulations in PS should be re-examined, and the spirit of these regulations reconsidered, which will help in forming the new recommendations.

q) There is some conflict between the current regulations and the main aims of establishing KGs (using protection as an excuse), and they hope that any new regulations take this vital part into account. In other words, they believe that the new regulations should be based on KG aims.

r) A lot of current regulations are not clear enough and they hold more than explanations, which enable any KG to circumvent the law.

s) The new regulations should focus on the capacity of each KG (linked to its spaces, facilities, equipment, toys, and KG staff), which should be done while taking into account the place of this KG (city, village or refugee camp). In addition, the needs of the area and its limited resources, in which KGs are located, should be kept in mind while forming the new regulations.

t) The application of these laws should not be mandatory for a period; they should be imposed gradually and in stages. This should be done after the consultation with the KGs and the concerned authorities.

u) It is better to allow the allocation of the ground and first floor for the children, with the allocation of the third floor for managerial matters such as the staff room.

v) KG facilities should be dealt with in a way similar to public schools in terms of supporting them by development projects.

### 7.2.3. Reviewing the first draft with parents

#### 7.2.3.1. Expected benefits

a) A better environment for their children for playing and learning.

b) An environment that encourages children to communicate and interact freely with others.

c) Encouragement for parents to visit the KG and be interactive in KG activities.

d) A reduction in the rate of injuries, among children as well as staff.

e) Peace of mind and tranquillity for their children, especially for working parents.

f) An increase in the attraction factors of KGs that have direct impact on children, which will focus on building their personal commitment to attend KG and interact with its activities.

g) Free barriers, and a safe and interesting environment for children, will facilitate the integration of KG children, especially in the first days of KG enrolment.

h) WCUs will have a chance to learn, play and interact with normal children instead of enrolling them in a special school, which will let them feel they have equal rights.

#### 7.2.3.2. Expected difficulties

a) Increase in tuition fees.

b) Closing the only KG in their neighbourhood or their village if they could not achieve the new regulations, which would prevent children from joining pre-schools because of the difficulty of sending their children to the closest KG.

#### 7.2.3.3. Parents' recommendations

a) KGs in PS should receive financial support from the PA, share tuition fees, and provide KGs with all requirements to achieve the new regulations, which will enable these KGs to reach the new target without increasing the financial burden on parents.

## 7.3. THE MONITORING ASPECTS BY PALESTINIAN AUTHORITY

It is believed that MOHE needs to have an independent and impartial centre to monitor and inspect early education facilities in PS. This new centre will focus mainly on the quality of the service[118] in these facilities and also will have the responsibility to report directly to KG providers, MOHE and decision makers in the Palestinian Authority (PA) as well. These reports will come out as a result of hundreds of inspections and regulatory/random visits throughout PS, which will be carried out by specialist inspectors and experts in the type of service.

All KG facilities must be checked to identify the quality of services provided in these education facilities and their suitability to care for young children. If a provider does not meet the required standards, the centre can require it to take the necessary action to improve or it will not license it to operate. However, in such extreme cases, when it may require suspended operations or closure of the KG facility, the centre has responsibility to work on collecting evidence and presenting available information, which they used to build their professional judgements, to the KG provider, MOHE and decision makers in PA.

On the other hand, this proposed centre will work with PS KGs that cannot meet the PS KG building regulations (standards) or some of them, in order to support their improvement, keep an eye on their progress and share with them the best practice to reach their shared goals. This centre will be considered the main adviser that has skills and knowledge in this particular field, which can be used by providers when they are looking for advice or assistance in developing their learning environments.

The main aim of establishing such centres should be clear, from the beginning, for all parties. All key players must be aware that these centres will not be established as a new monitoring tool that will work on catching providers' mistakes and omissions for pursuing opportunities to punish them and collect fines. These centres must not been used as a threat for providers,

[118] Which are related to the quality of place and the quality of learning environment of early education buildings in PS

because the constant threat of suspending operation or closure of the KG facilities causes fears of these centres and the lack of confidence to work with them, especially if their feedback is not accompanied by realistic and appropriate solutions for their problems. The main goal of establishing these centres is to work together to develop the current and the future learning environment of PS KGs, which will enable them to achieve their aims for creating a supportive environment for creativity within a safe, healthy and interesting atmosphere.

## 7.4. Summary

The recommendations of the participants showed their readiness to cooperate and respond to all items of new KG building regulations (with reservations on three items)[119] and their complete willingness to contribute to the implementation of its provisions in the event while taking their concerns into account. Their concerns are concentrated mostly on ways to finance and support the developing project, and they focus on: the spirit of the regulation – in other words it needs to demonstrate that MOHE's inspectors have more than a literal understanding of the text of the new regulations; finding the appropriate mechanism to address management problems in MOHE before starting the application and activation of any new regulations; tightening internal control in the structures department in MOHE; reorganising the licensing of the KG building process and collecting the department under one roof in the MOHE; focusing on raising awareness among parents about the importance of the learning environment in KGs; and the application of laws in stages, following a pre-defined clear timetable taking into account the different existing categories of KGs in PS in terms of their capacity, resources, location, and the region's need.

It is believed that the goal of achieving safe, healthy and motivating learning environments is reachable in PS KGs. However, the outcomes of the key players' feedback show that developing the PS KG learning environments comes through the participation of all parties concerned. Therefore, the first step should be to collect all parties to sit together to determine both the general polices and the desired goals for the next phase. Then they can work on the agreement on the main strategies and proper procedures that should be followed to achieve them. The previous two phases are so vital before starting to work on drafting new regulations, which will work on closing the gap in the quality of space. However, this gap has occurred as a result of a lack of the previous factors that are related to lighting, $CO_2$, humidity, temperature and the relationship between inside and outside. It must be emphasised that the future solutions must come through a general policy agreed upon in

[119] Visual contact between inside facilities and outside (free barriers), fighting fire system sprinklers, and barriers that should be installed on the front of KG gates to prevent children from rushing towards the main street, where there is a high risk of collision with vehicles.

advance by all parties concerned. The general agreement on developing effective policies should have clear objectives with a priorities timetable/schedule for implementation, which was previously agreed by all key players in PS. It will be a vital issue for developing this sector, because the study shows that addressing the quality of space in PS KG buildings[120] without having an agreed policy and clear objective to be achieved is like addressing the symptoms and not the real causes, which are the origin of the problem. The next step will be to draft PS KG building regulations and a timetable for achievement, while the methods of application will be left later for specialists and experts in these fields (quality of space). In addition, it is believed that the role of the MOHE should be at the first rank for counsel and assistance at all stages and for monitoring and continuous assessment after operation, rather than nitpicking for the purpose of collecting fines or be used as a constant pressure instrument to threaten KGs, which are contrary to the laws of KG buildings in PS, suspension and closure of facilities or paying high fines.

[120] Such as addressing the high concentration of $CO_2$ and %RH of inner air of KG buildings

## SECOND: THE FUTURE REGULATIONS OF LICENSING PS KGS (MOHE)

PA, which is represented in MOHE, should change its ways in dealing with KGs as a private business, like supermarkets and factories, and start considering them as bodies with human factors, in the same category as schools. Private KGs hold a huge responsibility in educating and raising children instead of the government. Therefore, PA should not only share responsibility but also duties towards these KGs. The financial support is only a part of this responsibility that should be considered here. In addition, KGs are looking forward to all kinds of support to improve their performance and to be compatible with the school stage later. MOHE should work on improving its management of this sector, whereby it is believed that establishing a spirited department from specialists in licensing KG buildings would be the right step towards this. Moreover, intensive courses in licensing KG buildings for the structure department inspectors and members will help.

It is the MOHE's responsibility to be aware of the local community, as well as KGs, and of the importance of the quality of the learning environment and the role that it plays in developing children (mentally and physically), and their safety and health. This aim can be achieved by arranging annual workshops and meetings with both KG owners and parents.

PA, represented in MOHE and the Ministry of Planning, should be directing NGOs and donor countries towards supporting the learning environment, but it has not gained an appropriate share of support and attention yet. In addition, the private sector and businessmen should be encouraged to invest in this sector by providing them with the right infrastructure for such projects and creating an environment for these kinds of investments.

PA can guide their traders and the local companies to import the necessary equipment where not available in the local market through tendering and procurement processes, for devices such as air quality meters and outdoor toys with high standards. This may provide KGs with high standard equipment at a cheaper price.

Fighting the corruption in PA and taking control in MOHE departments and training their inspectors[121] will give a helping hand towards establishing a base to receive and apply the new recommendations by focusing on the soul of the law.

KGs should be aware of the importance of developing the interior environment of their facilities before starting to push them towards applying new regulations. They should have self-motivation and self-conviction about the feasibility and the importance of these regulations before they are imposed. The study shows that the lack of awareness is a more important factor preventing the development of the learning environment than the lack of money and resources. Awareness of the importance of this issue will lead to KGs activating self-motivation; then it is believed that each KG can create the best solutions from the local environment, which fit its limited resources to meet its needs at the same time: “Necessity is the mother of invention”. In this phase, the MOHE role is to support them in what they are looking for in an academic and professional way.

The new KG building regulations may be printed out and published (a handbook) for PS KGs as tips and recommendations for developing the learning environment of KG facilities before being obliged to by the law. This will give KGs a better chance to examine them closely and identify a methodology for following them, especially if they partake in induction sessions that explain their importance and the best ways of applying them. This will facilitate applying these regulations in the future when MOHE and the local community decide it is the right time to start activating them officially. The application of all regulation items should be applied in pre-agreed stages (by all parties) according to a schedule, keeping in mind the differences of the targeted categories of KG facilities[122]. Moreover, it should take into account the enrolment capacity of the KG facilities, their financial capacity, their geographic location, their activities and achievements[123], their category, and the needs of the area in which they are located.

[121] Intensive sessions about: the aim of KGs, the aim of licensing their buildings, and the methodology of inspection and the best ways to deal with the daily problems in this field are required.
[122] According to MOHE’s ranking
[123] Regarding MOHE’s annual reports

The appropriate mechanism to provide support for projects aimed at rehabilitation facilities for the reception of physically disabled children should be found, especially for the WCU category. This can be done by drawing a clear plan aiming to attract international assistance in this area or by attracting local investors to invest in this sector, which helps in filling the gap.

PA, represented in MOHE and the Ministry of Planning, should urge donor institutions and countries to build exemplar KGs in each PS city or province to be a model for others KGs. These models that meet all standards and licensing requirements must be different in: the sizes of buildings, spaces, capacity, budgets, and locations, but all of them should share the basic objectives of establishing KGs. Therefore, all of them will be built specially to serve these aims. These model KGs will be open exhibitions for all PS children.

# Chapter 8 : THE STUDY CONCLUSION

## 8.1. CONCLUSION

By the end of this study, although drafting new PS KG building regulations, which are tailored specially to cover the key players' needs in PS, is a vital step towards developing the PS KG learning environment, it is believed that the key players' problems and difficulties in this sector cannot be addressed by interior design only. The PA, which is presented by MOHE, needs to draft clear policies to outline the future of KG, which they are looking to achieve, before drawing the strategies and plans to achieve it. The new PS KG building regulations and the KG design guide are just considered as tools in MOHE's hands, which can be used later to research its goals. However, these 'tools' could be ineffective and unhelpful without an appropriate mechanism to apply and then to be able to be monitored and supervised by the decision maker later (MOHE). In addition, these regulations will be ineffective if they cannot get an all-party consensus. The final revised recommendations should not only be acceptable to all parties but also the key players must be aware of their importance to develop their learning environments and the role that the learning environment plays in developing childhood in PS.

## 8.2. CONTRIBUTE TO KNOWLEDGE

Although the contribution to the body of the knowledge focuses mainly on the PS case, this research work could have a substantial impact and contribution to knowledge in countries with similar conditions (see page17).

## 8.3. FUTURE DEVELOPMENT AND FUTURE WORK

1. Identifying, outlining and clarifying the main aims of establishing KG facilities in PS society and the main aims of establishing the KG building regulations to raise awareness and educate the key players about them and the importance of their role in the local society.

2. Drafting new policies by MOHE to deal with PS KG facilities, which must be based on: considering PS KG facilities as educational facilities not private businesses,[124] and based on considering MOHE as the advisor, mentor and the main supporter of these educational facilities if necessary. This advice and support to create safe, healthy, interesting, and supporting learning environments in KG facilities must be forwarded by MOHE from the preparatory process for the establishment, throughout the periods of preparation and after facilities start working.
3. There is a need for more research on ways to develop the means of control and supervision by the Palestinian Ministry of Education for KG facilities, which will enable MOHE to have an appropriate mechanism to be able to monitor and provide support when needed.
4. There is a need to develop the curriculum tailored to the specific needs and priorities of each one of the KG key players in PS (especially children), which contributes to guide MOHE, KG designers and those who may be concerned to determine the learning environments to be achieved. In this case the future learning environment in PS KG will be built or modified to serve and support specific educational aims within these facilities.
5. More specific research, which should be done by specialists in each field of the quality of place,[125] is needed to outline specific solutions for KG building problems in PS. In addition, the converted KGs from PS traditional buildings need more studies about the best solutions for redesigning and modifying their structures to obtain the benefits of their advantages, which support KG aims, while extruding their problems. This will save PS traditional buildings from collapse and destruction by reusing them, and also preserve available resources and energy and find quick solutions to provide the local community with alternative model KGs at a lower cost.
6. There is a need for more research on the methodology of classifying the KG facilities in PS, which MOHE can apply and follow when dealing with different KG

[124] Or at least similar to private schools in PS
[125] Such as KG lighting and ventilation… etc.

classes, which take into account the recent changes in the composition of KGs and their working methods, establishment, financing and operation.

7. There is a need for more research about the methodology of applying and following the recommended KG building regulations from this study. This will be important to identify the future strategies, which guarantee the achievement of the desired objectives of the new laws.
8. There is a need for more research on the impact of developing interior environments on children's behaviours and outcomes, which will indicate that the interior design is not the kind of luxury for the rich in the developed countries but is actually an urgent need for all KGs regardless of their classification, sizes or locations.
9. There is a need for adopting a national project to rebuild trust between providers and MOHE.
10. There is a need for establishing an independent and impartial centre to monitor and inspect early education facilities in PS, which will focus mainly on the quality of the service in these buildings.

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# Figures

# Tables

# Appendixes

## Appendix 1


**Figure 280: Palestinian loss of land between 1922-2010 (from left to right) the map of PS: at the beginning of the British Mandate 1922, at the end of the British Mandate 1947, the map of the UN Partition Plan for Palestine 1947, the map of PS after the Israeli Military Occupation 1948, the map of PS after the Israeli Military Occupation 1967, and the current situation in 2011 (Medicks, 2005) & (Al-Zaytouna, 2010).**

| Year | Jews | Arabs | Total | % of Jews to Total |
|---|---|---|---|---|
| **1914** | 60,000 | 731,000 | 791,000 | 7.585% |
| **1922** | 83,790 | 668,258 | 752,048 | 11.141% |
| **1931** | 174,606 | 858,708 | 1,033,314 | 16.897% |
| **1941** | 474,102 | 1,111,398 | 1,585,500 | 29.902% |
| **1950** | 1,203,000 | 1,172,100 | 2,375,100 | 50.650% |
| **1960** | 1,911,300 | 1,340,100 | 3,251,400 | 58.783% |
| **1970**[126] | 2,582,000 | 1,045,000 | 3,627,000 | 71.188% |
| **1980** | 3,282,700 | 2,100,000 | 5,382,700 | 60.986% |
| **1995** | 4,495,100 | 3,506,900 | 8,002,000 | 56.173% |
| **2005** | 5,275,700 | 5,139,100 | 10,414,800 | 50.656% |
| **Estimated**[127] **the end 2014** | 6,100,000 | 6,100,000 | 12,200,000 | 50% |
| **Estimated 2025** | 6,200,000 | 7,200,000 | 13,400,000 | 48.2% |

**Table 44: The population was divided in PS by religion (Arab: Muslims & Christians/Jewish) between 1914 and 2025. Sources: 1914 (McCarthy, 1990), 1922 & 1931 (British Mandate Census, 1922), 1941 (Esco Foundation Palestine, 1947, p. 46), 1950-2005 (ICBS, 2007) and 2015-2025 The PCBS estimation for the end of 2014 and 2025 (2010)**

126 Decrease in the Arab population between 1960 and 1970 due to Arab refugees from the 1967 War.
127 According to PCBS estimations (2010), which are dependent on the current growth rates.
128 Historic PS: including what is known today as Israel and the Palestinian territories.

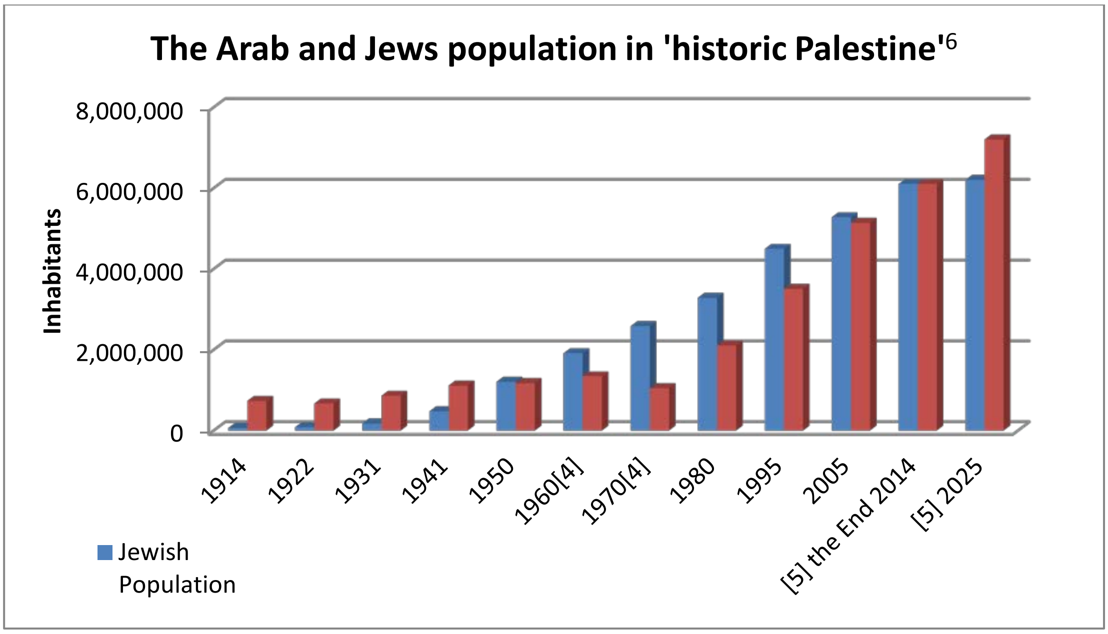



**Figure 281: The above chart shows the population of (Arab: Muslims & Christians/Jewish) in PS between 1914 and 2025**

## Appendix 2

**Palestinian refugees' migration routes during 'Nakba', the 1948 war**

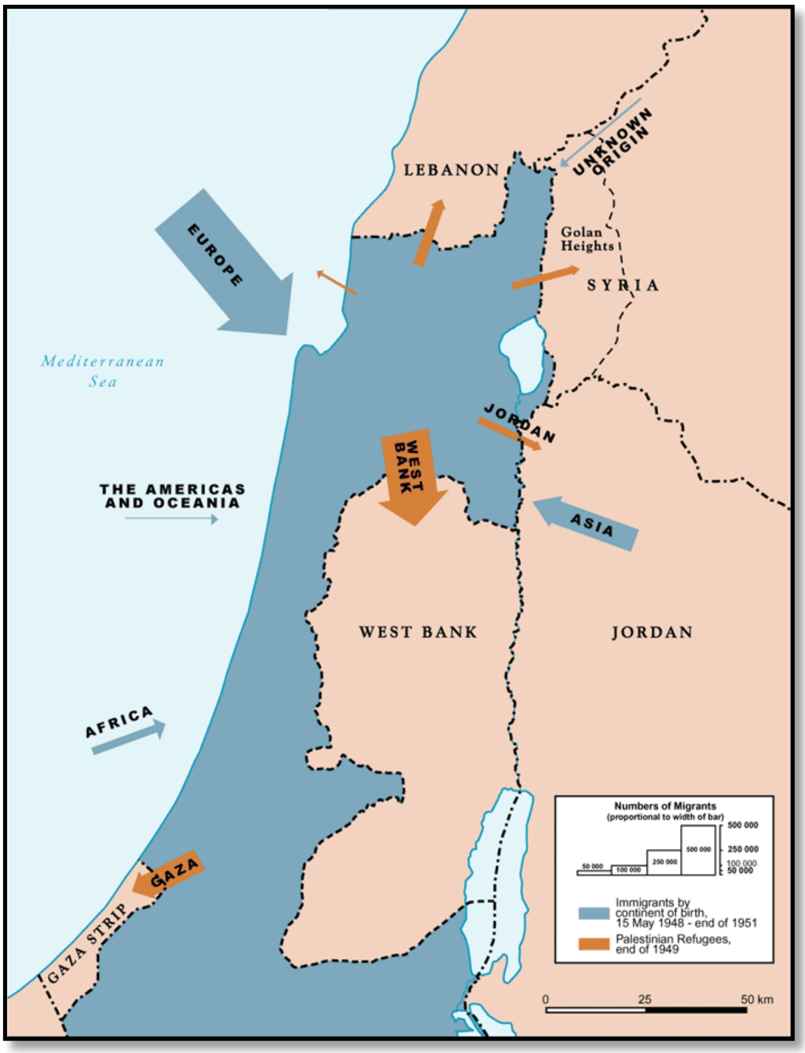



**Figure 282: Palestinian refugees' migration routes during 'Nakba', the 1948 war (PASSIA, 2007)**

During the 1948 PS War, approximately 750,000 out of 900,000 Palestinian Arabs were dispossessed and ethnically cleansed out of their homes and lands that became the State of Israel.

European Jews, who were mostly fleeing anti-Semitic Europe, were taking possession of their homes, farms, and businesses.

Although, Jews 'claim' that Arabs were scheming to 'push' Israeli Jews into the sea, in 1948 up to 25% of all Palestinian refugees where pushed into the sea to face their destiny (PalestineRemembered, 2001).

# Appendix 3

| Element | Jan. | Feb. | Mar. | Apr. | May | Jun. | Jul. | Aug. | Sept. | Oct. | Nov. | Dec. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean Max. Temp (c˚) | 19.1 | 20.9 | 26.4 | 32.3 | 36.1 | 37.6 | 37.8 | 36.7 | 33.7 | 29.3 | 24.3 | 20.4 |
| Mean Min. Temp (c˚) | 7.4 | 8.3 | 12.9 | 17.9 | 21.2 | 22.4 | 22.1 | 20.4 | 17.6 | 14.2 | 10.5 | 9.0 |
| Absolute Max. Temp. (c˚) | 25.0 | 27.6 | 34.8 | 40.6 | 43.4 | 45.6 | 44.0 | 45.0 | 46.4 | 41.4 | 33.8 | 28.8 |
| Absolute Min. Temp. (c˚) | 0.2 | - 0.4 | 4.2 | 11.4 | 13.2 | 19.0 | 18.0 | 15.4 | 10.4 | 2.4 | 2.8 | 2.1 |
| Mean Temp. (c˚) | 13.2 | 14.6 | 19.6 | 25.1 | 28.6 | 30.0 | 29.9 | 28.5 | 25.6 | 21.7 | 17.4 | 14.7 |
| Mean Wind Speed (Km/h) | 8.9 | 10.4 | 7.9 | 9.4 | 12.5 | 14.8 | 16.0 | 15.3 | 15.8 | 16.2 | 13.1 | 7.6 |
| Pressure (mbar) | 1048 | 1046 | 1046 | 1042 | 1039 | 1035 | 1034 | 1037 | 1040 | 1041 | 1044 | 1048 |
| Mean Sunshine Duration (h/day) | 5.5 | 5.9 | 6.5 | 8.7 | 10.5 | 11.6 | 11.7 | 11.8 | 9.4 | 9.3 | 7.7 | 5.6 |
| Mean RH (%) | 70 | 65 | 60 | 51 | 47 | 44 | 40 | 38 | 38 | 45 | 57 | 70 |
| Total Rainfall (mm)* | 36 | 31 | 22 | 7 | 0 | 0 | 0 | 0 | 2 | 10 | 25 | 33 |
| Total Evaporation (mm)* | 78 | 76 | 94 | 135 | 227 | 267 | 298 | 289 | 261 | 189 | 128 | 59 |
| Total PET (mm)* | 52 | 56 | 91 | 140 | 166 | 188 | 194 | 181 | 163 | 121 | 85 | 58 |
| Max Monthly Rainfall (mm) | 62 | 112 | 81 | 71 | 7 | 0 | 0 | 7 | 22 | 20 | 41 | 104 |

**Table 45: The average temperatures for every month of the year in the Jericho Station (PMD, 2009)**

| Element | Jan. | Feb. | Mar. | Apr. | May | Jun. | Jul. | Aug. | Sept. | Oct. | Nov. | Dec. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean Max. Temp (c˚) | 13.1 | 14.4 | 17.2 | 22.2 | 25.7 | 27.9 | 29.1 | 29.4 | 28.4 | 25.8 | 20.2 | 14.6 |
| Mean Min. Temp (c˚) | 6.2 | 6.7 | 8.8 | 12.1 | 14.9 | 17.4 | 19.3 | 19.5 | 18.5 | 16.2 | 12.1 | 7.8 |
| Absolute Max. Temp. (c˚) | 22.9 | 28.1 | 30.4 | 35.0 | 38.6 | 38.0 | 38.1 | 38.6 | 38.8 | 35.3 | 30.7 | 28.0 |
| Absolute Min. Temp. (c˚) | - 0.6 | - 2.8 | - 1.0 | 0.6 | 6.9 | 11.4 | 12.3 | 15.9 | 13.0 | 9.3 | 1.4 | 0.3 |
| Mean Temp. (c˚) | 9.6 | 10.5 | 13.0 | 17.1 | 20.3 | 22.6 | 24.2 | 24.4 | 23.4 | 21.0 | 16.1 | 11.2 |
| Mean Wind Speed (Km/h) | 8.7 | 9.5 | 10.0 | 10.2 | 10.7 | 12.0 | 12.4 | 11.7 | 10.3 | 7.7 | 7.8 | 7.7 |
| Pressure (mbar) | 953 | 952 | 951 | 949 | 948 | 946 | 944 | 945 | 948 | 951 | 953 | 953 |
| Mean Sunshine Duration (h/day) | 4.7 | 4.8 | 6.4 | 8.2 | 8.9 | 8.4 | 9.6 | 10.9 | 10.2 | 9.8 | 7.0 | 4.5 |
| Mean RH (%) | 67 | 67 | 62 | 53 | 51 | 55 | 61 | 65 | 64 | 57 | 57 | 67 |
| Total Rainfall (mm)* | 141.1 | 146.9 | 104.0 | 20.2 | 7.8 | 0.0 | 0.0 | 0.0 | 1.8 | 20.7 | 77.1 | 140.5 |
| Total Evaporation (mm)* | 49 | 67 | 99 | 149 | 203 | 226 | 238 | 218 | 178 | 131 | 75 | 49 |
| Total PET (mm)*[129] | 36 | 36 | 55 | 82 | 106 | 112 | 117 | 112 | 105 | 103 | 72 | 36 |
| Max Monthly Rainfall (mm) | 389 | 389 | 220 | 225 | 65 | 3 | 0 | 1 | 22 | 83 | 249 | 472 |

**Table 46: The average temperatures for every month of the year in the Nablus Station (PMD, 2009)**

[129] Monthly Total

| Element | Jan. | Feb. | Mar. | Apr. | May | Jun. | Jul. | Aug. | Sept. | Oct. | Nov. | Dec. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean Max. Temp (c˚) | 10.2 | 11.5 | 11.5 | 14.6 | 19.6 | 23.6 | 25.9 | 27.2 | 27.2 | 26.0 | 23.2 | 17.5 |
| Mean Min. Temp (c˚) | 4.0 | 4.7 | 4.7 | 6.5 | 9.9 | 13.2 | 15.8 | 17.0 | 17.0 | 15.9 | 14.0 | 9.9 |
| Absolute Max. Temp. (c˚) | 21.4 | 21.0 | 21.0 | 23.6 | 32.6 | 34.0 | 33.5 | 38.0 | 33.4 | 34.6 | 31.6 | 31.6 |
| Absolute Min. Temp. (c˚) | - 1.0 | - 3.0 | - 3.0 | - 0.5 | 1.0 | 6.5 | 10.0 | 13.0 | 12.0 | 12.0 | 9.0 | 2.0 |
| Mean Temp. (c˚) | 7.1 | 8.1 | 8.1 | 10.5 | 14.7 | 18.4 | 20.8 | 22.1 | 22.1 | 20.9 | 18.6 | 13.7 |
| Mean Wind Speed (Km/h) | 12.4 | 12.8 | 12.8 | 12.6 | 11.5 | 9.3 | 9.3 | 9.2 | 8.7 | 8.1 | 8.0 | 8.8 |
| Pressure (mbar) | 903 | 902 | 902 | 901 | 901 | 901 | 900 | 899 | 899 | 902 | 903 | 904 |
| Mean Sunshine Duration (h/day) | 4.7 | 4.8 | 4.8 | 6.4 | 8.1 | 9.0 | 8.3 | 9.6 | 10.9 | 10.3 | 9.8 | 7.0 |
| Mean RH (%) | 74 | 72 | 72 | 66 | 55 | 48 | 51 | 57 | 60 | 62 | 59 | 64 |
| Total Rainfall (mm)* | 133.6 | 141.6 | 141.6 | 91.7 | 25.4 | 4.7 | 0.5 | 0.0 | 0.0 | 1.6 | 14.6 | 66.7 |
| Total Evaporation (mm)* | 65 | 81 | 81 | 93 | 139 | 166 | 200 | 221 | 225 | 157 | 112 | 87 |
| Total PET (mm)*[130] | 23 | 25 | 25 | 41 | 67 | 97 | 106 | 110 | 106 | 94 | 87 | 54 |
| Max Monthly Rainfall (mm) | 351 | 335 | 194 | 235 | 37 | 10 | 0 | 0 | 21 | 65 | 220 | 334 |

**Table 47: The average temperatures for every month of the year in the Hebron Station (PMD, 2009)**

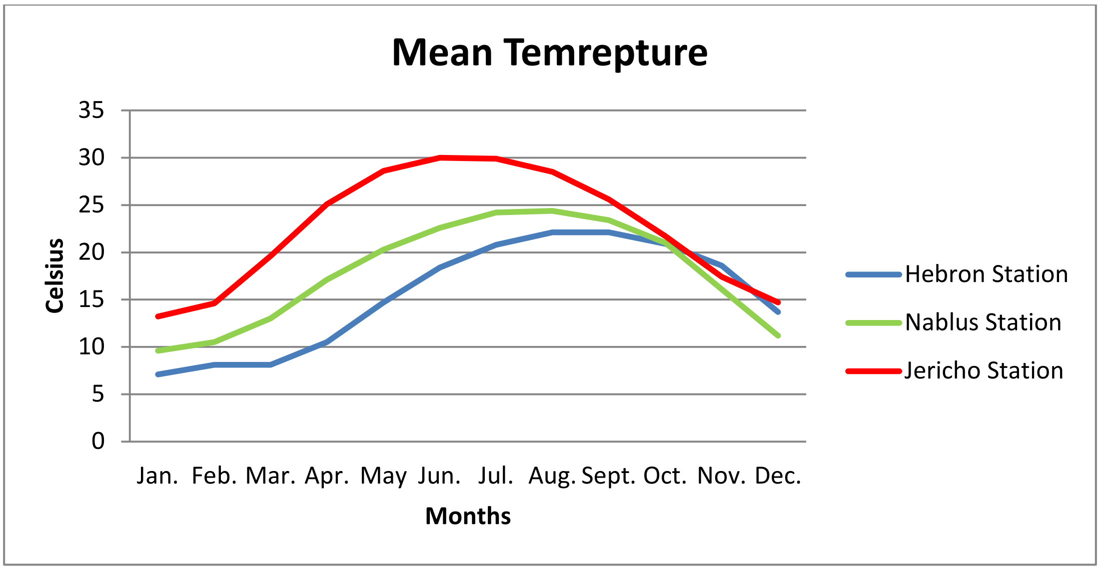



**Figure 283: Depends on the above tables from PMD this chart shows the mean temperature (C$^{o}$) in the three provinces in the West Bank.**

[130] Monthly Total

## Appendix 4

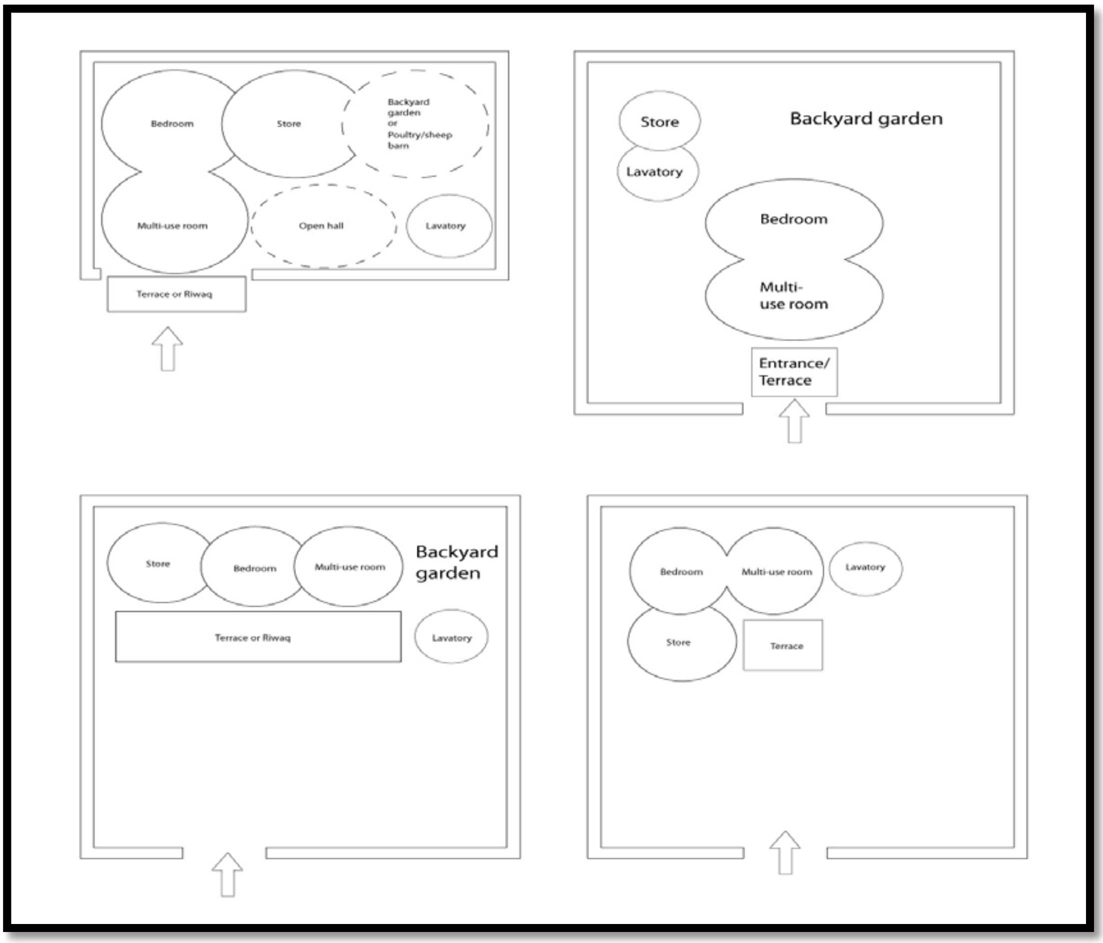



**Figure 284: Examples about the general distribution patterns of traditional houses in PS (Type one)**

## Appendix 5

PS regulations indicate the need to provide at least one lavatory for each 20 children Staff toilets (MOHE, 2012). In addition, although the Education (School Premises) Regulations 1999 do not specify a minimum provision the Workplace (Health, Safety and Welfare) Regulations, which lay down the following minimum levels for all workplaces in its Code of Practice:

| People at work | WCs |
|---|---|
| 1 | 1 |
| 6-25 | 2 |
| 26-50 | 3 |
| 51-75 | 4 |
| 76-100 | 5 |

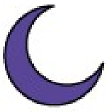
**Table 48: The minimum number of toilets per person at work**

## Appendix 6

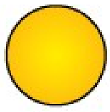
| $CO_2$ (ppm) | Exposure | Population | Effects |
|---|---|---|---|
| 500-1500 | Repeated daily | Healthy individuals | Well tolerated |
| 1,000 | 22 days | Healthy volunteers | Serum Ca and urinary P output ↓ progressively throughout exposure; Ca deposition in body tissues ↑ |
| 1,200 | 25 days | Healthy volunteers | Serum Ca, total & active ↓; bone formation sl ↓; bone resorption sl ↑ |
| 1,500 | 42 days | Healthy volunteers | V. ↑ 35% by Day 5; TV ↑ 200 mL by Day |

**Table 49: Effects of continuous or repeated $CO_2$ exposure (Rice, 2003)**

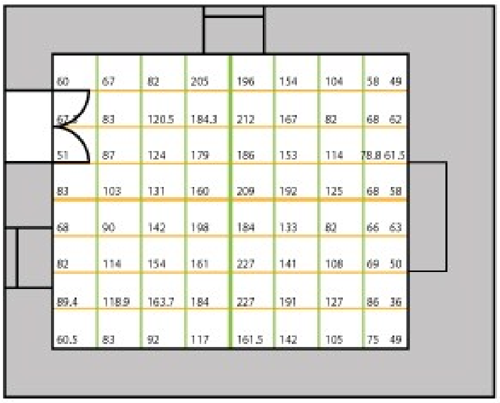
## Appendix 7



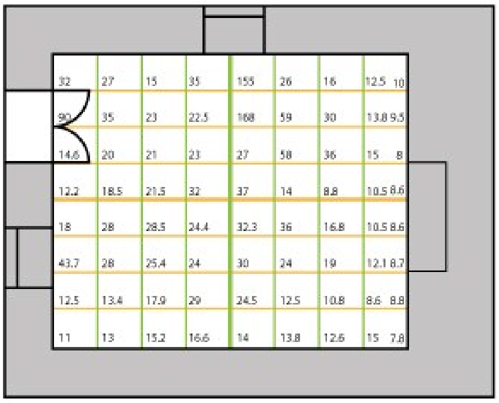
Clear Night
8:00 pm
19 Dec 2011



Sunny and Clear Day
12:30 pm
19 Dec 2011

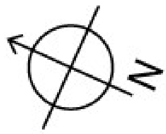


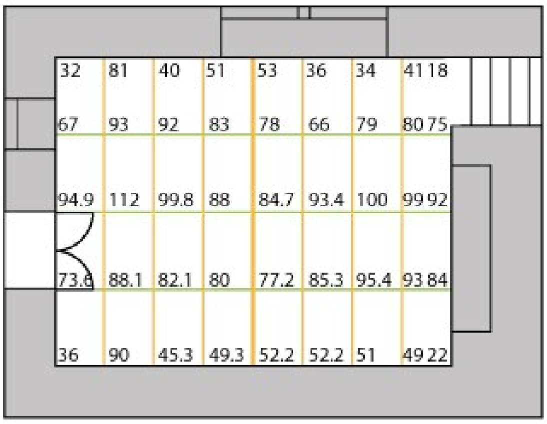

⊗ Artificial light sources only



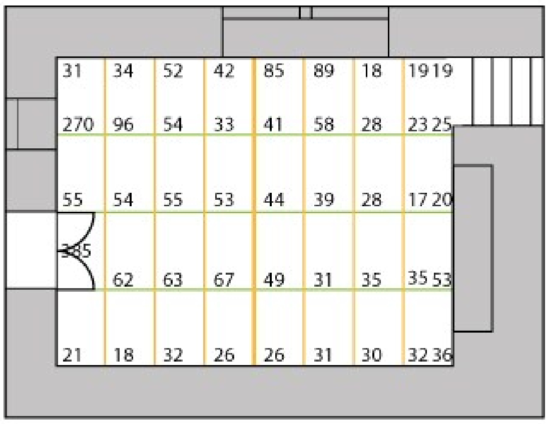

Natural light sources only

(EL) KG
The main classroom
Up to 30 children, at the moment
20 children
4.9m X 5.9m



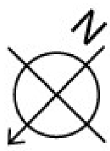




⊗ Artificial light sources only



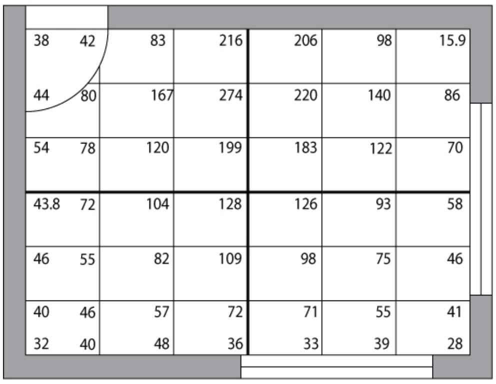

Natural light sources only

(EL) KG
The second classroom
4.8m X 6.15m

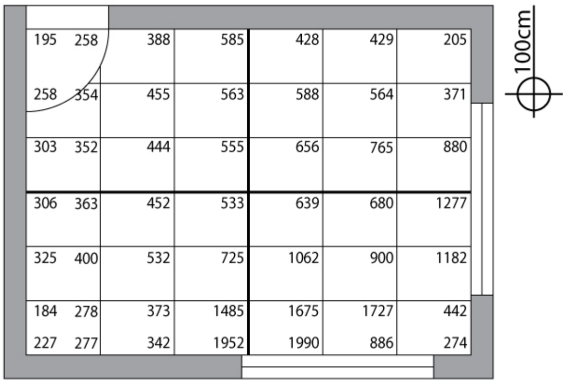


Clear Night
8:00 pm
21 Dec 2011

Sunny day
12:00 noon
27 Dec 2011




Artificial light sources only




Daylight that integrates
***some**** electric light sources

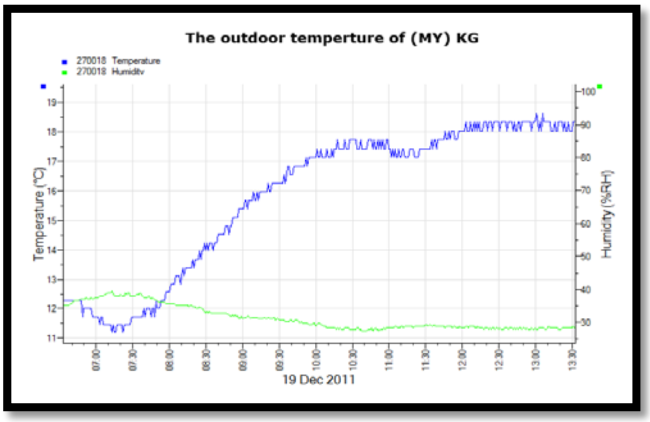
Room No 7 in (MY) KG

# Appendix 8

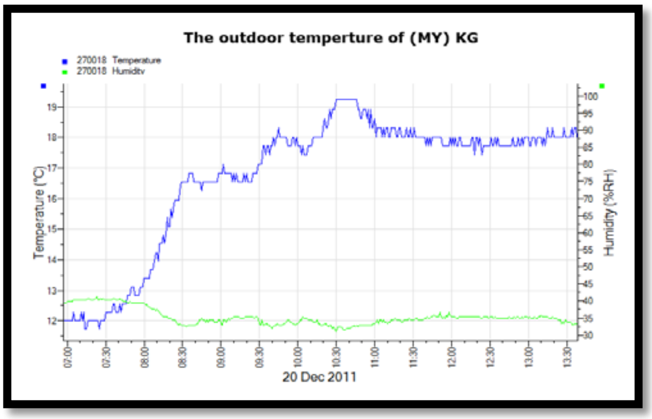
(MY) KG: The outside temperature and humidity

Device: Tinytag Ultra 2_ TGU-4500 (data Loggers for measuring temperature and humidity).

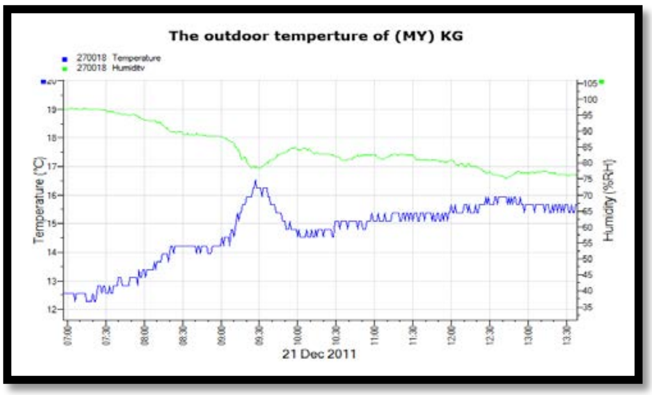
| | 1 |
|---|---|
| S/N | 270018 |
| Type | Tinytag Ultra H°C/%RH |
| Description | The outside (MY) KG |
| Property | Temperature |
| S/N | 270018 |
| Logging Started | 18 Dec 2011 16:13:57 |
| Logging Ended | 21 Dec 2011 18:28:57 |
| Logging Duration | 3 days 2 hours 15 minutes |
| Offload Operator | Ehab Abu-Hannoud |
| Start Delay | 0 second |
| Interval | 1 minute |
| Stop Mode | When full |
| Run Id | 8m2h 8ptf 4o6r |
| Offload Time | 21 Dec 2011 18:28:27 |
| Number of Readings | 4456 |
| Logging Mode | Minutes Mode |
| Statistics Start Time | 18 Dec 2011 16:13:27 |
| Statistics End Time | 21 Dec 2011 18:28:57 |
| Minimum Reading | 11.2 °C |
| Maximum Reading | 19.2 °C |
| Average Reading | 14.5 °C |
| Mean Kinetic Temperature | 14.8 °C |




The outside temperature and humidity 19 December 2011




The outside temperature and humidity 20 December 2011




The outside temperature and humidity 21 December 2011

# Appendix 9


Figure 285: The internal temperature and humidity rate in the fist day (classroom No. 5)

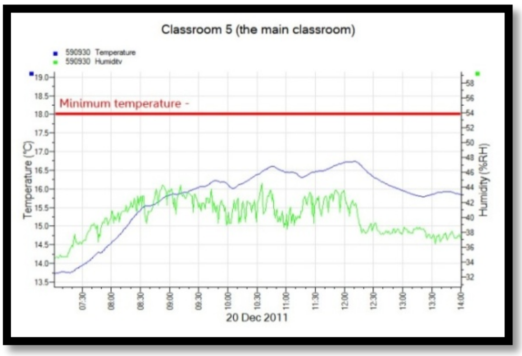



Figure 286: The internal temperature and humidity rate in the second day (classroom No. 5)

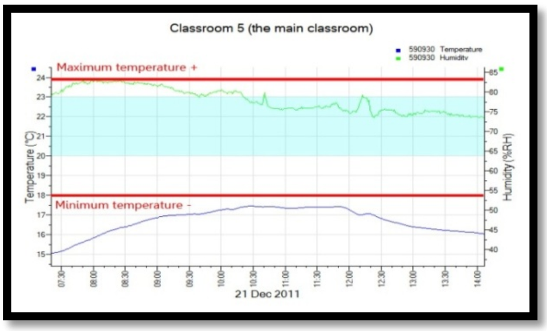



Figure 287: The internal temperature and humidity rate in the third day. (MY) KG, classroom No. 5

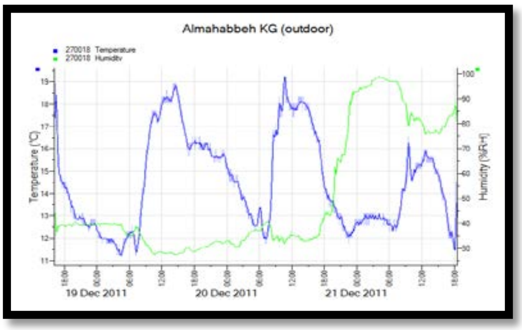



Figure 288: The outside temperature and humidity rate during three days, between 19 December and 20 December 2011

## Appendix 10

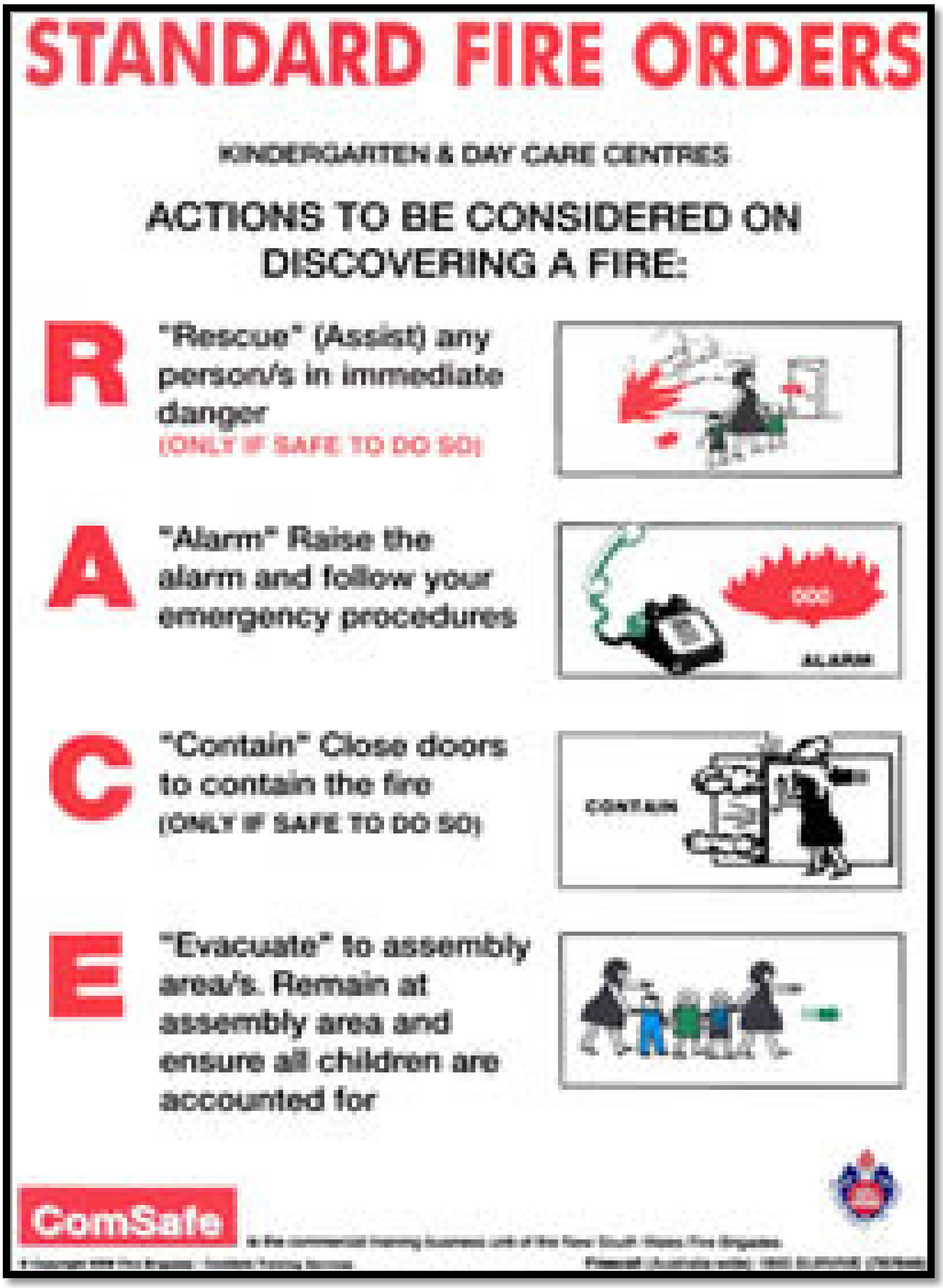



Figure 289: Standard fire fighting orders (KG and day care centres): a coloured A4-size workplace poster highlighting the four actions that need to take in the case of fire (RACE = Rescue + Alarm + Contain + Evacuate). (NSW, 2007)

## Appendix 11

### Free access: wheelchair users

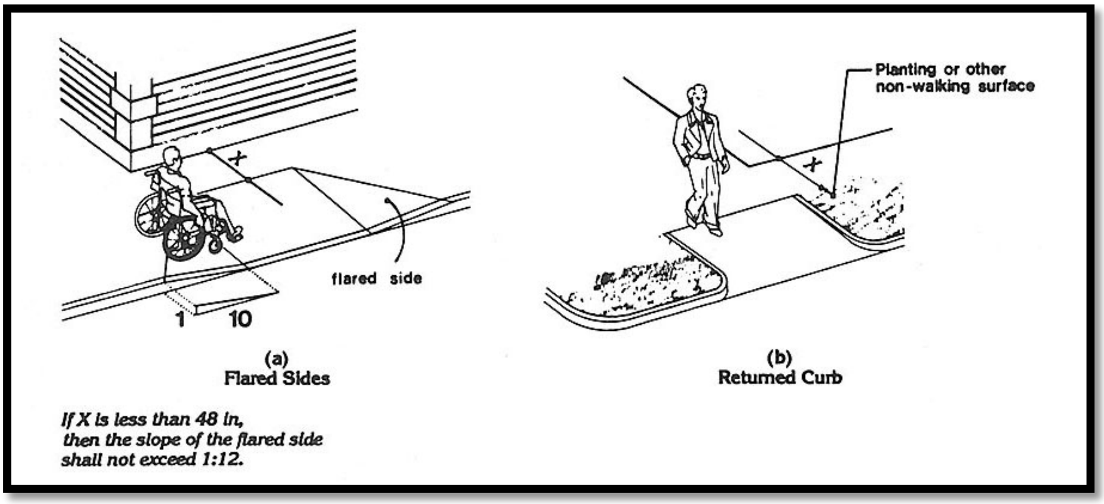



Figure 290: Side of curb ramps (U.S. Department of Justice, 1994, p. 518)

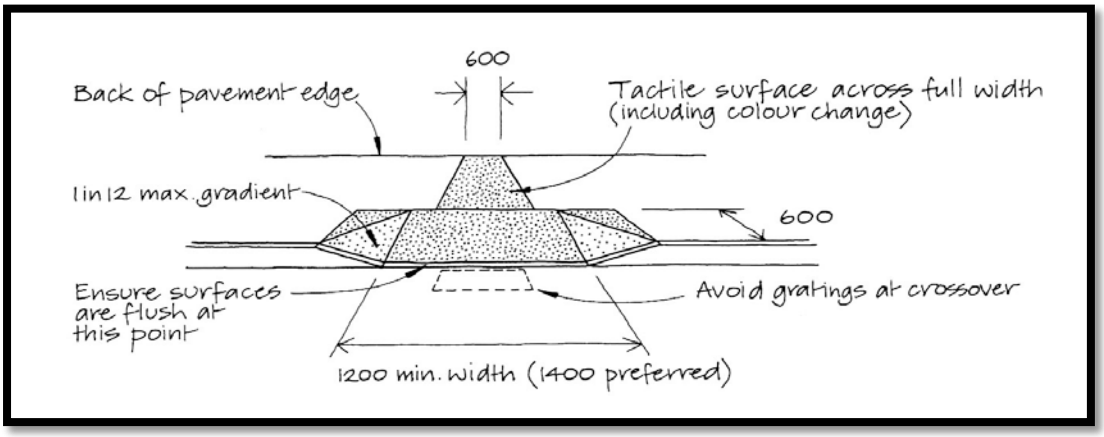



Figure 291: Approach routs (Wood, 1999, p. 13)

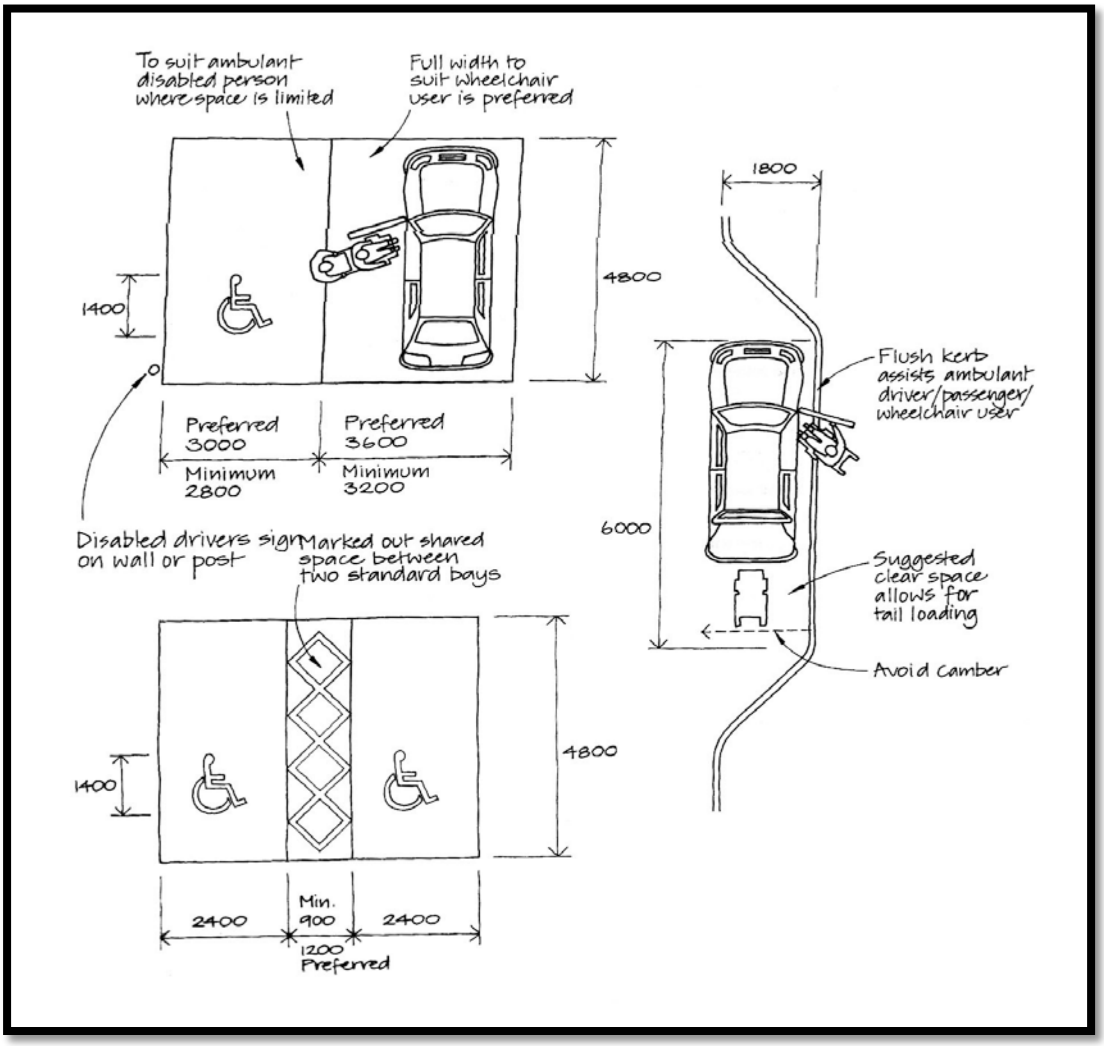



Figure 292: Dimensions of parking spaces (Wood, 1999, p. 12)

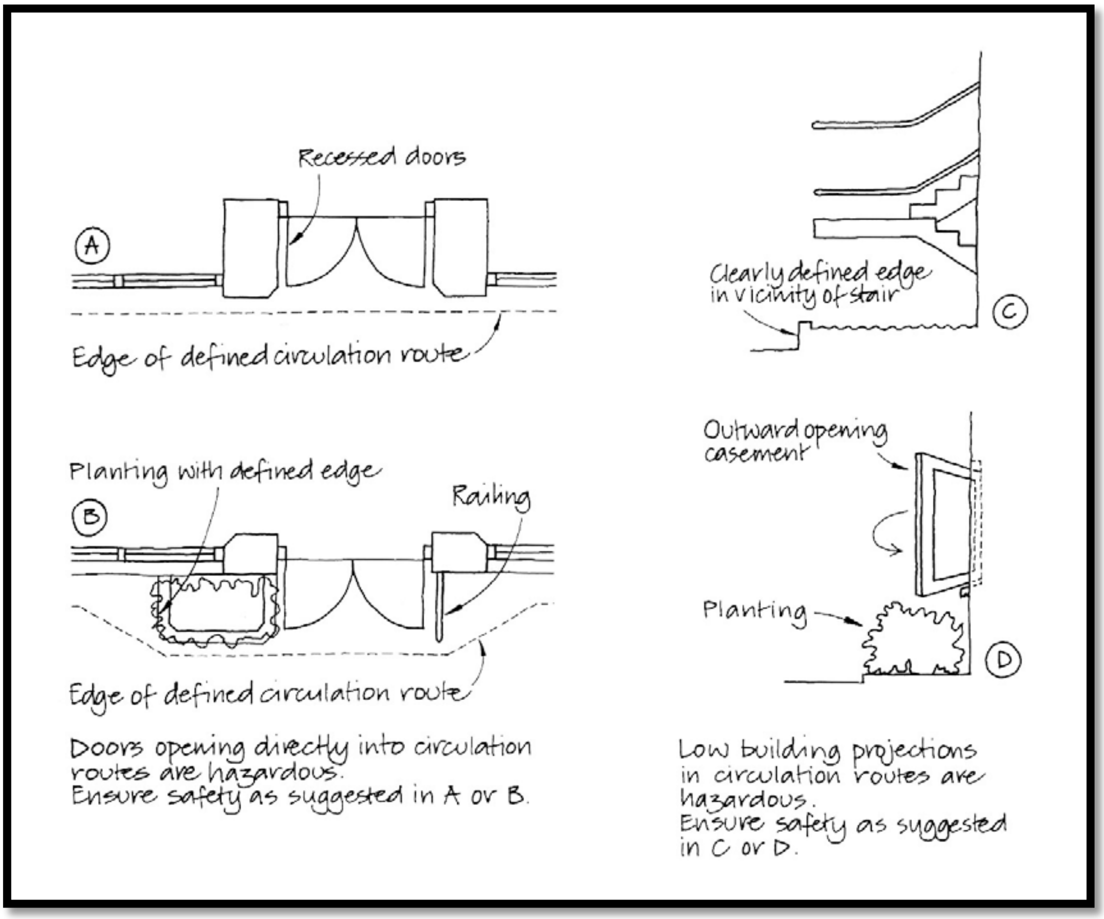



Figure 293: External routs (Wood, 1999, p. 14)

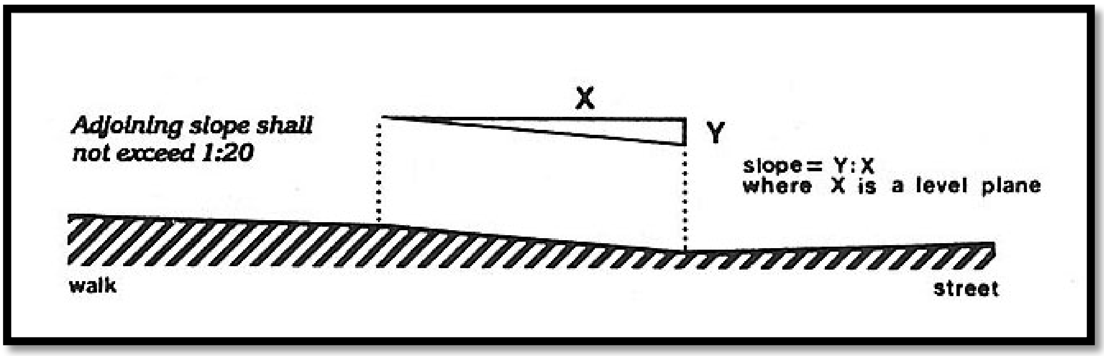



Figure 294: Measurement of curb ramp slopes (U.S. Department of Justice, 1994, p. 518)

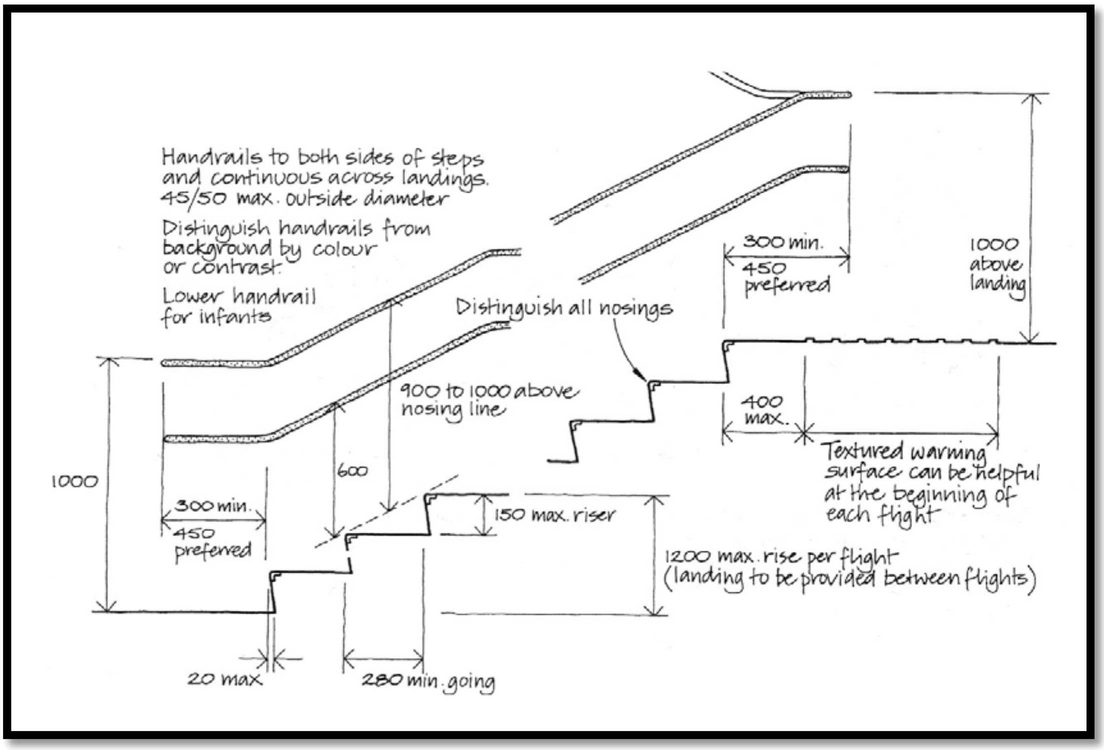



Figure 295: Stairs (Wood, 1999, p. 16)

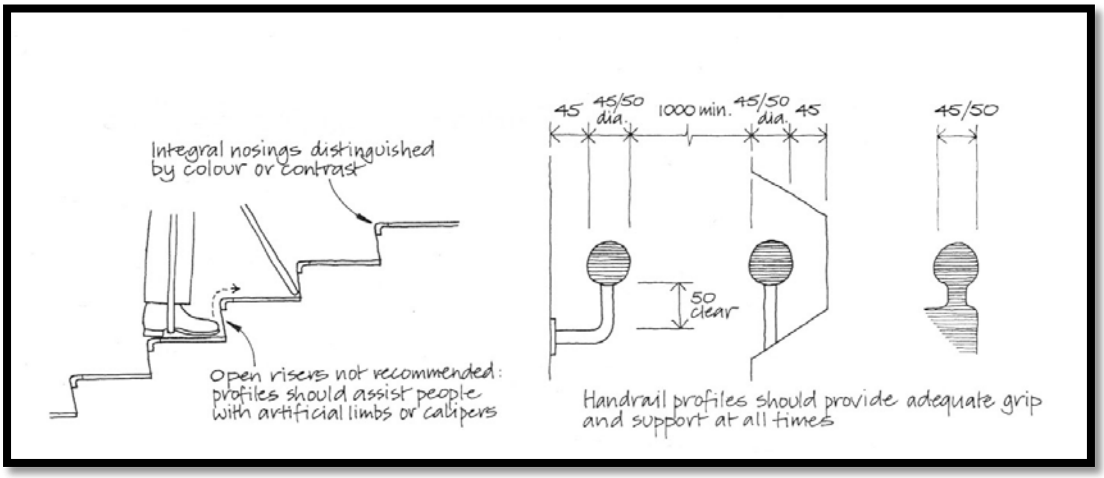



Figure 296: Stairs noises and handrail scale (Wood, 1999, p. 17)

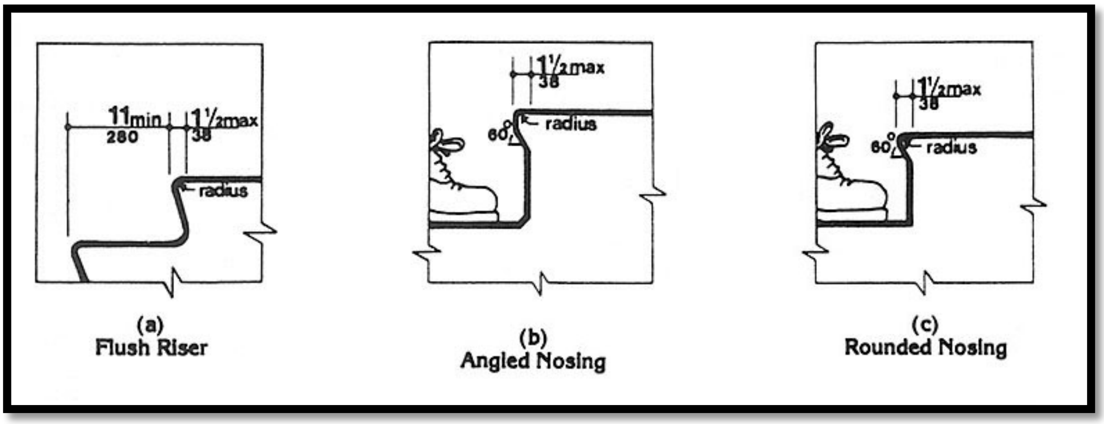



Figure 297: Stair shapes (U.S. Department of Justice, 1994, p. 522)

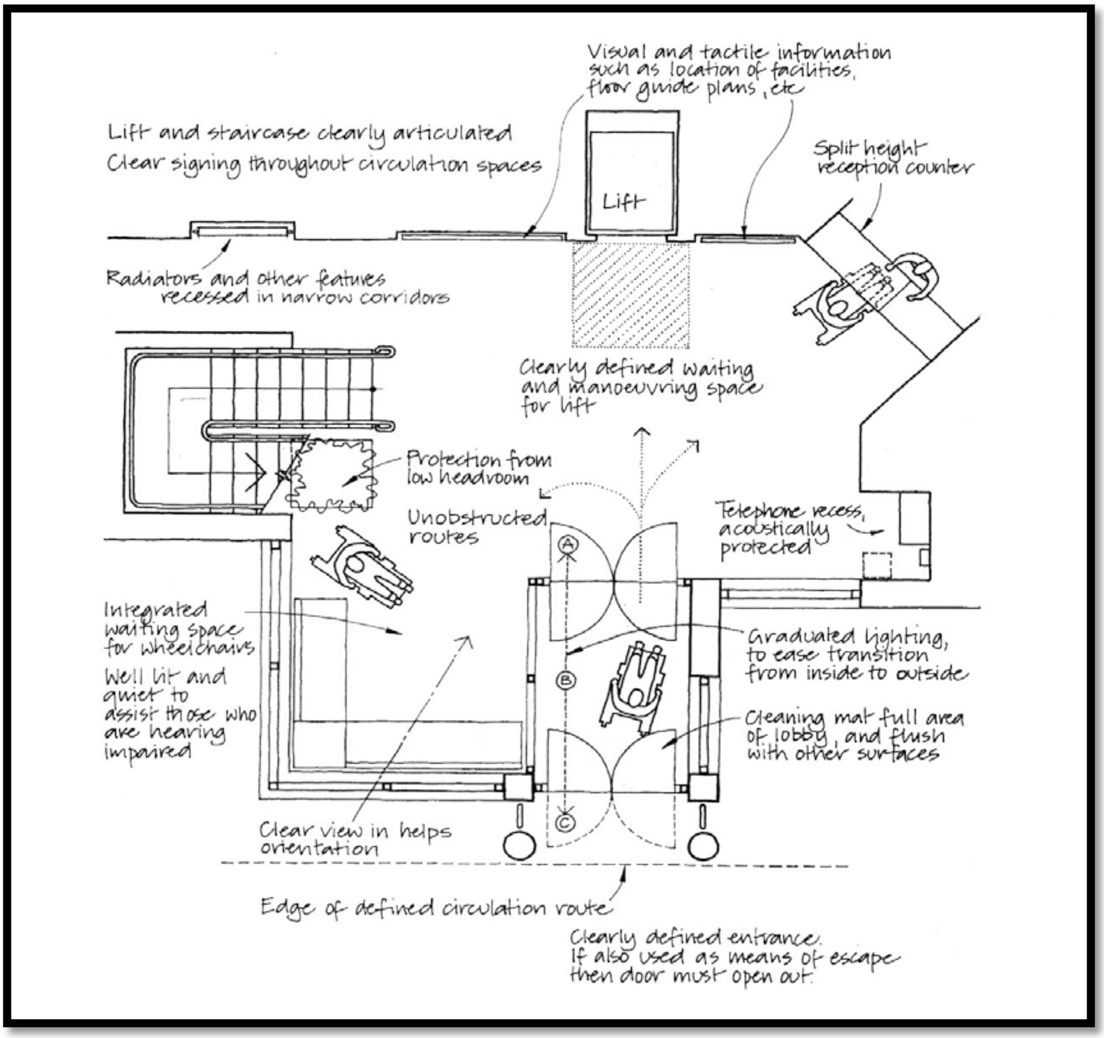



Figure 298: The main entrance-Lobby (Wood, 1999, p. 20)

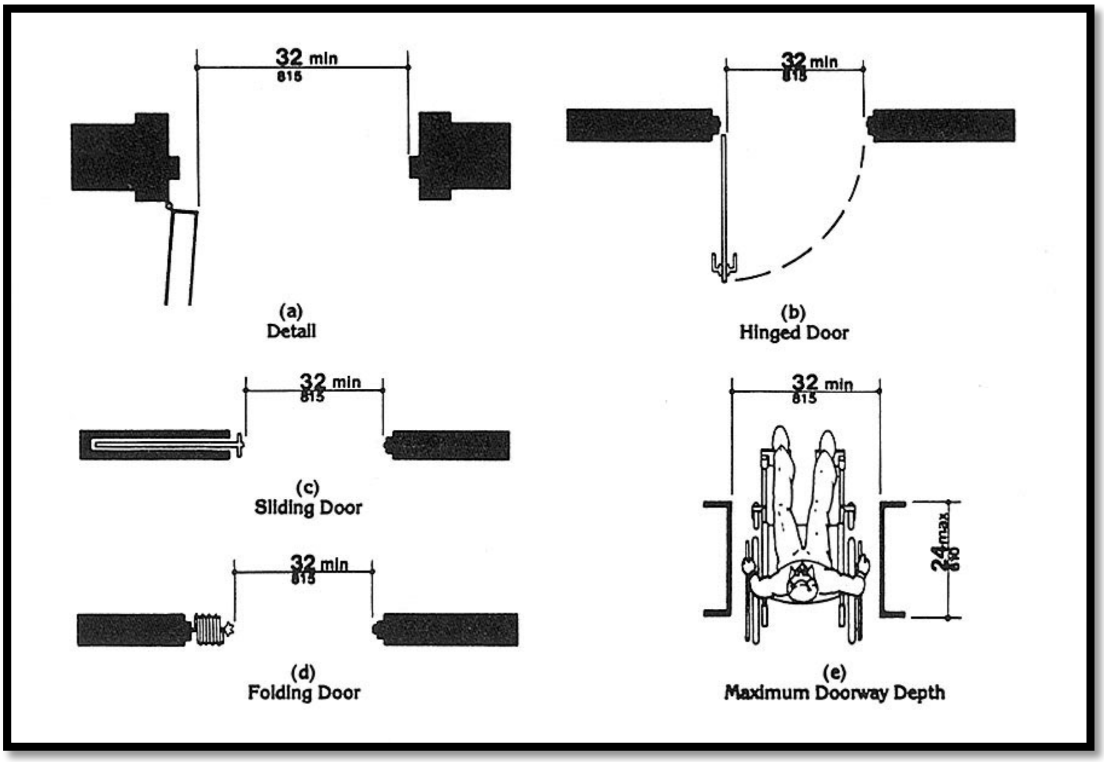



Figure 299: Clear doorway width and depth (U.S. Department of Justice, 1994, p. 528)

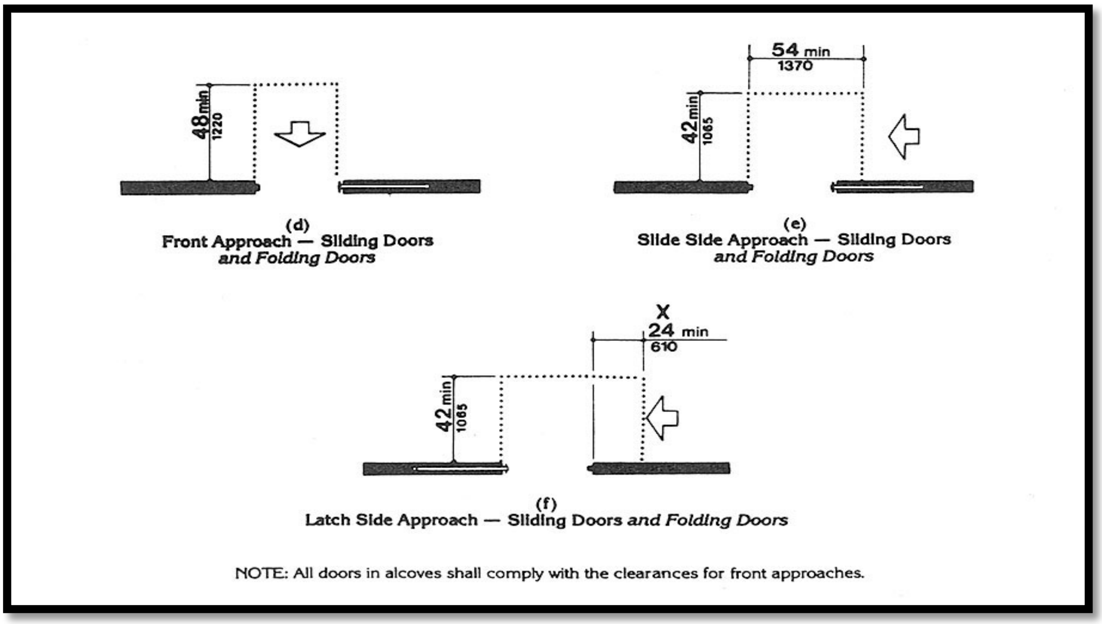



Figure 300: Manoeuvring clearance at doors (U.S. Department of Justice, 1994, p. 530)

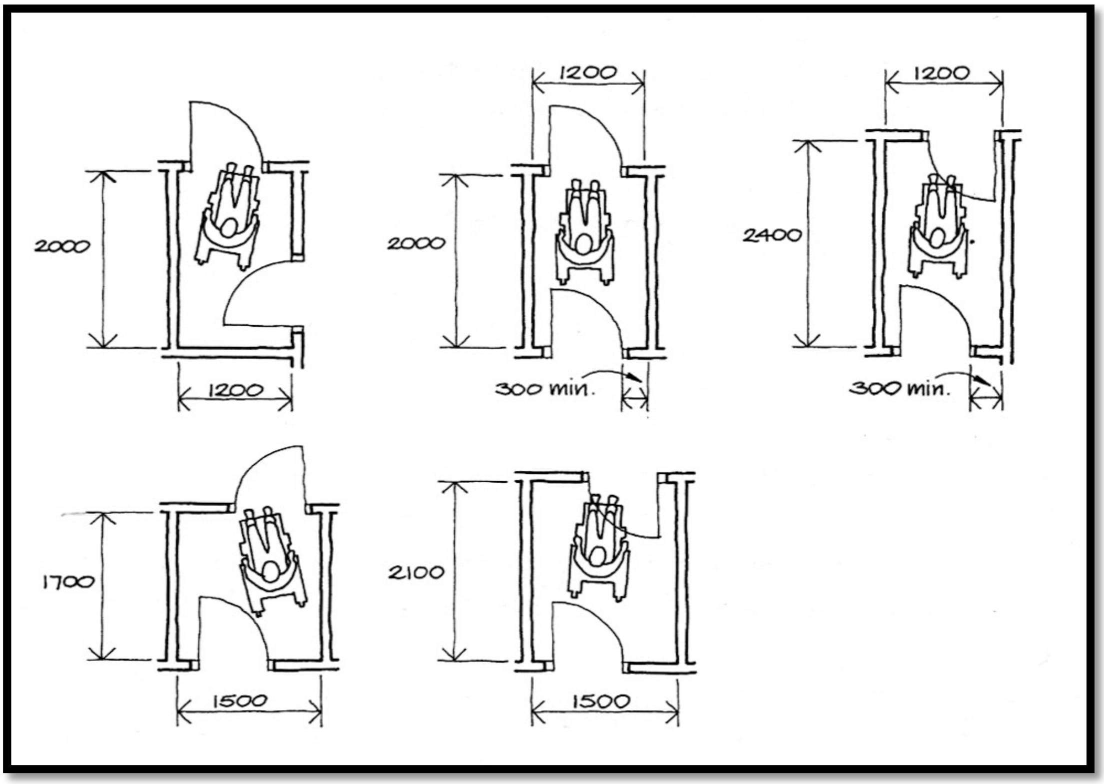



Figure 301: Two hinged doors in series (Wood, 1999, p. 22)

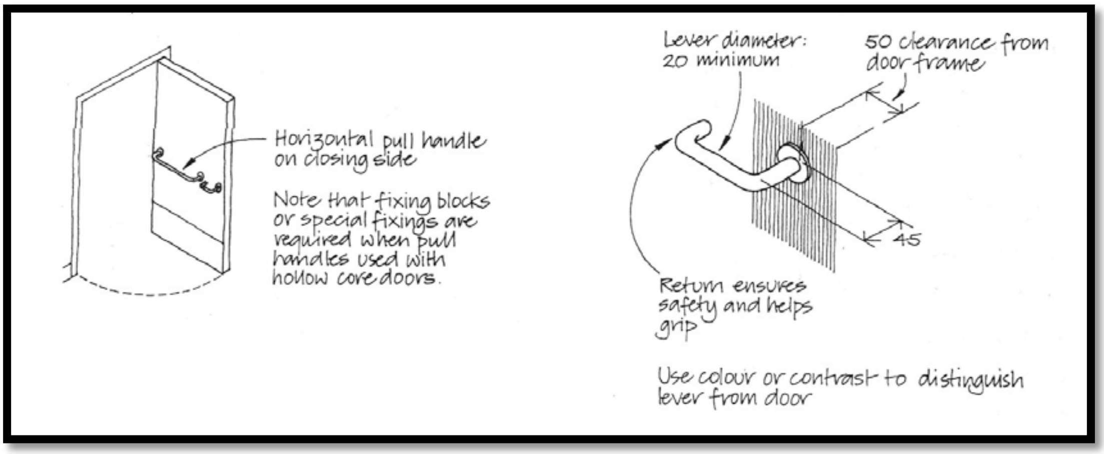



Figure 302: Door handles (Wood, 1999, p. 28)

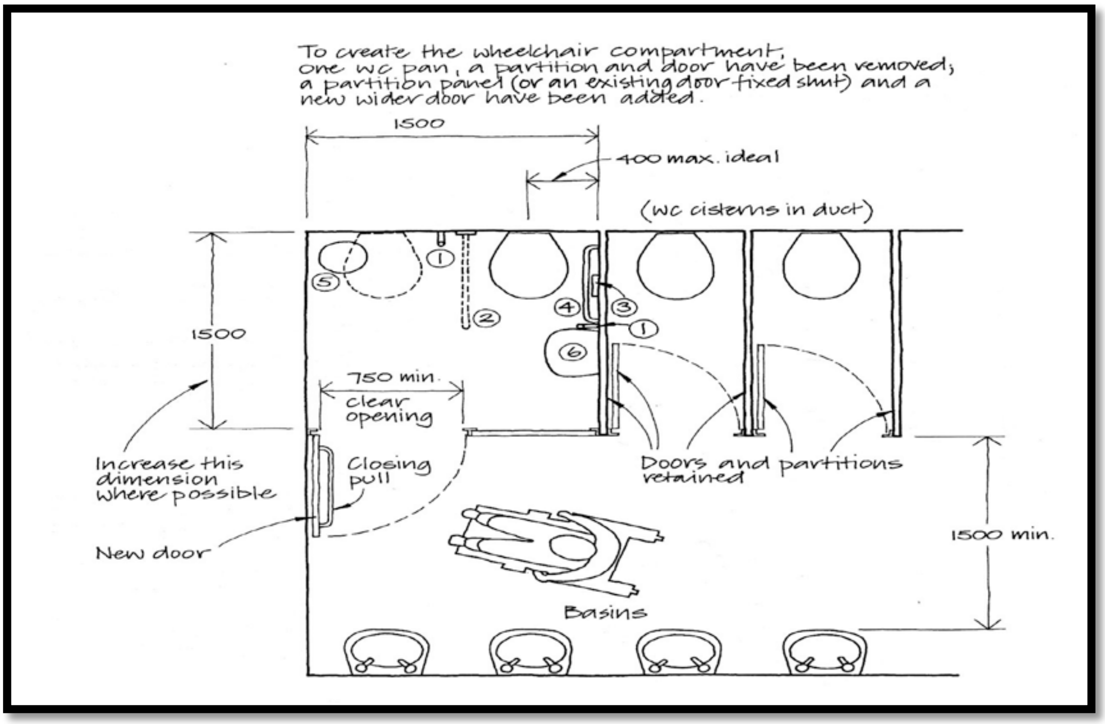



Figure 303: Adult lavatory accessible for wheelchair users (Wood, 1999, p. 34)

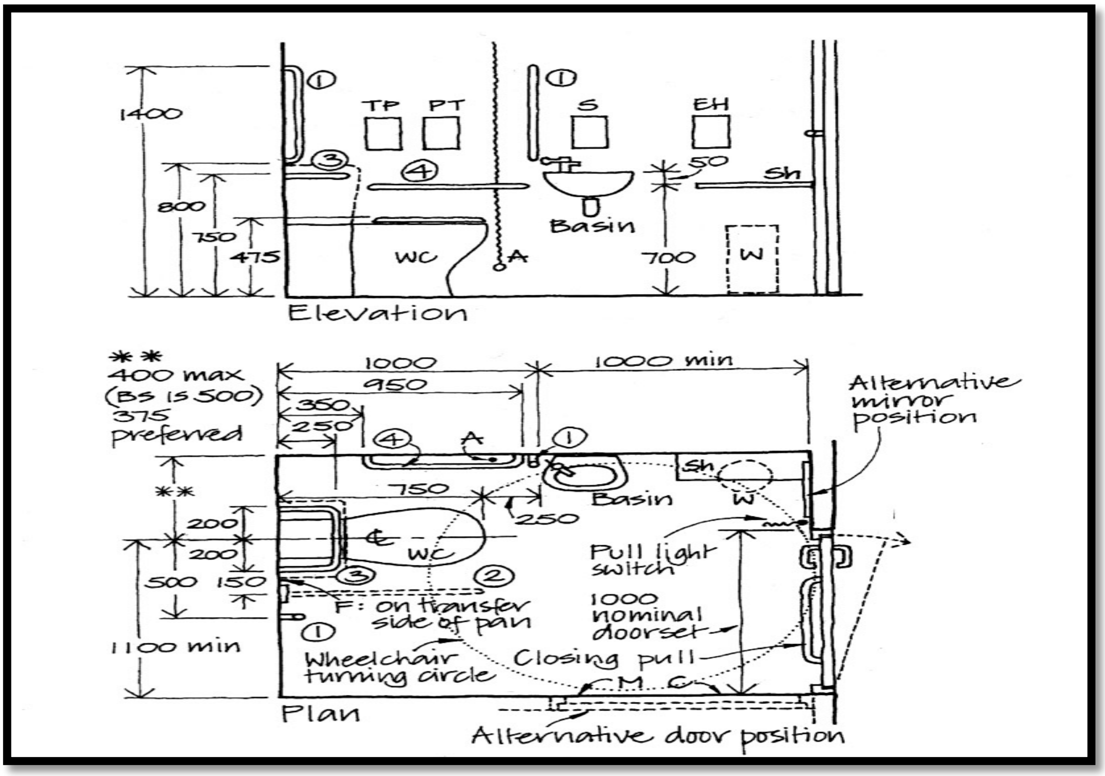


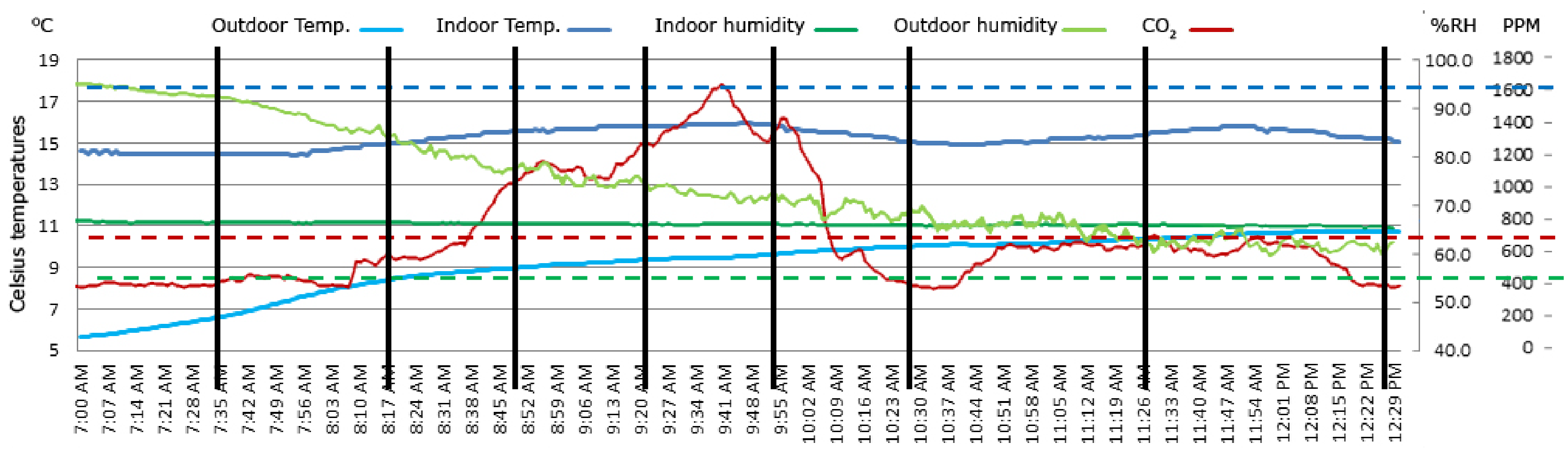

Figure 304: Standard lavatory layout for wheelchair users; 1500mm (Wide) X 2000mm (Length) minimum (Wood, 1999, p. 32)

## Appendix 12

### The cause of the Oslo Accords' failure, which led to the outbreak of Al-Aqsa Intifada (Omar, 2011) (Shlaim, The Rise and Fall of the Oslo Peace Process, 2005):

1. Oslo agreement was based on the principle of land for peace: The vast majority of Israeli settlers should be peacefully returned to Israel within the pre-1967 borders with the return of Palestinian refugees, the two-state solution, a state on the 1967 borders with land swaps, Jerusalem as the capital of the State of Palestine, negotiations with the PLO as the representative of the Palestinians.
2. The rising of Likud, which from the very beginning had been strongly opposition to the land-for-peace deal, has negative impact on the peace process. His leader was not only opposite to establish an independent Palestinian state, to the Palestinian right of return, and to the dismantling of Jewish settlements, but also emphasized Israel's authority over the entire of Jerusalem. Therefore, Likud used its power to arrest, freeze, and destroy the Oslo accords by acting unilaterally in demolishing Arab houses, imposing curfews, confiscating Arab land, and building new Jewish settlements. In addition, they used economic and political war against the Palestinians.
3. On the Palestinian side there was mounting frustration and deepening doubt that Israel would ever voluntarily accept a settlement that involved even a modicum of justice. Israel's apparent intransigence fed the belief that it only understands the language of force.
4. Israel benefited from the application of the Oslo agreement without doing what should be its obligations undertaken towards the Palestinian people, making it out of balance.
5. Oslo agreement could not achieve the Palestinian expectations after 7 years of stalling via non-purposeful negotiations by Israelis, which did not aim to put an end to the conflict but to earn more time. Oslo agreement was supposed to lead (after 3 year instead of 20 years) to end the Israeli's illegal occupation of the Palestinian territories and establish the independent state that lives side by side with Israel.

# Appendix 13




| Time | | Dec 2011 17 children |
|---|---|---|
| 7≤8 | 07:00 | Open the facility to receive children |
| | 07:10 | |
| | 07:20 | |
| | 07:30 | Morning assembly |
| | 07:40 | |
| | 07:50 | |
| 8≤9 | 08:00 | |
| | 08:10 | Reading |
| | 08:20 | |
| | 08:30 | |
| | 08:40 | Teaching Quran |
| | 08:50 | |
| 9≤10 | 09:00 | |
| | 09:10 | Writing |
| | 09:20 | |
| | 09:30 | |
| | 09:40 | Breakfast |
| | 09:50 | |
| 10≤11 | 10:00 | Play outside |
| | 10:10 | |
| | 10:20 | |
| | 10:30 | |
| | 10:40 | |
| | 10:50 | |
| 11≤12 | 11:00 | Clay (inside) |
| | 11:10 | |
| | 11:20 | |
| | 11:30 | |
| | 11:40 | |
| | 11:50 | |
| 12≤13 | 12:00 | Start leaving for home |
| | 12:10 | |
| | 12:20 | |
| | 12:30 | |

**Figure 305: The above chart summarises the relationship between the pupil's life-cycle during the (EL) KGh and indoor quality relative variables, which are indoor and outdoor temperature, the relative humidity, and the concentration of $CO_2$, December 2011. The accuracy of following and applying the timetable by teachers is approximately ±6 minutes**

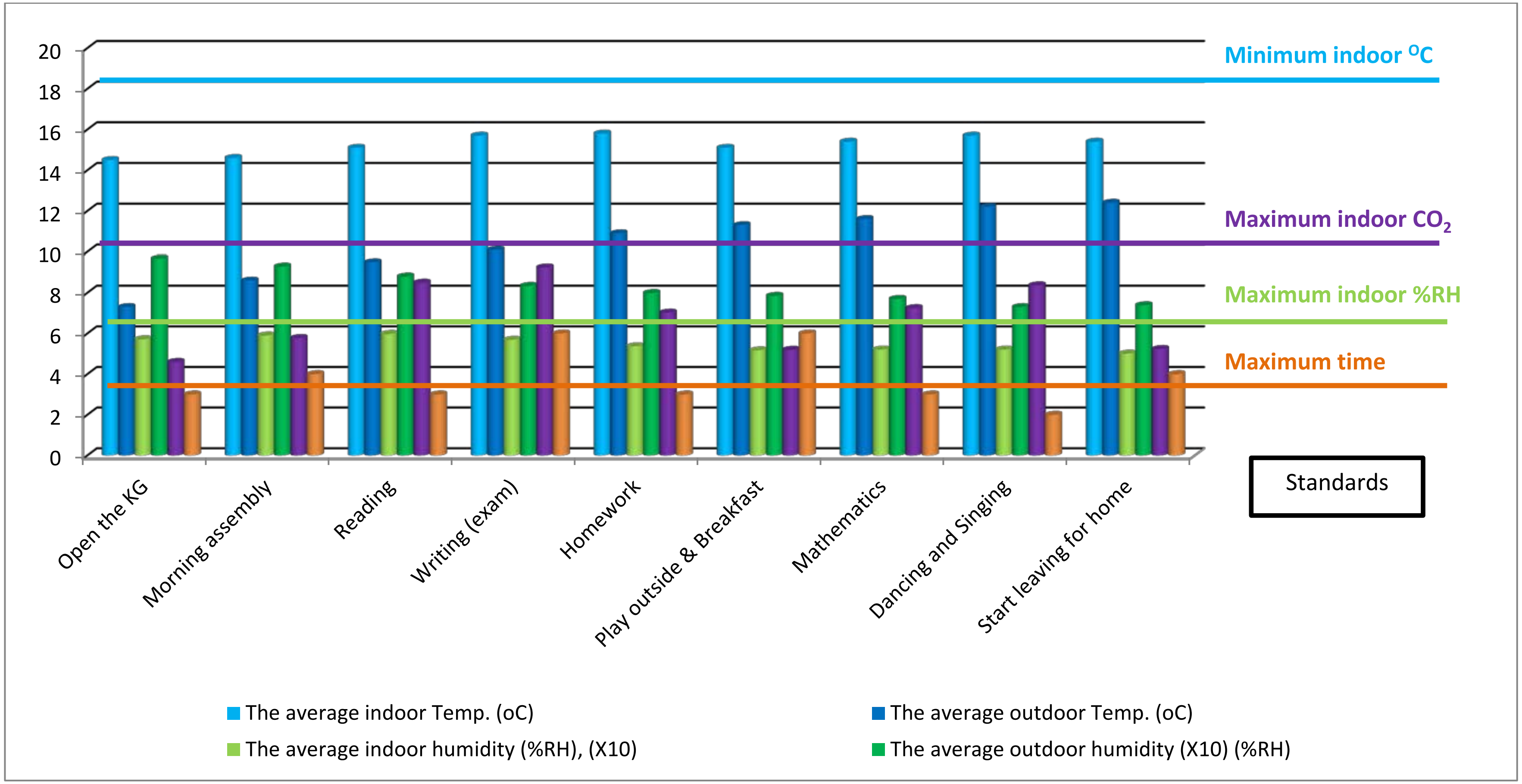



**Figure 306: The average amount of $CO_2$, temperature and the relative humidity inside and outside the (EL) KG building during the KGh and for each activity, 22 Dec 2011[131].**

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[131] While the outdoor $CO_2$ level was been 386ppm and 405ppm

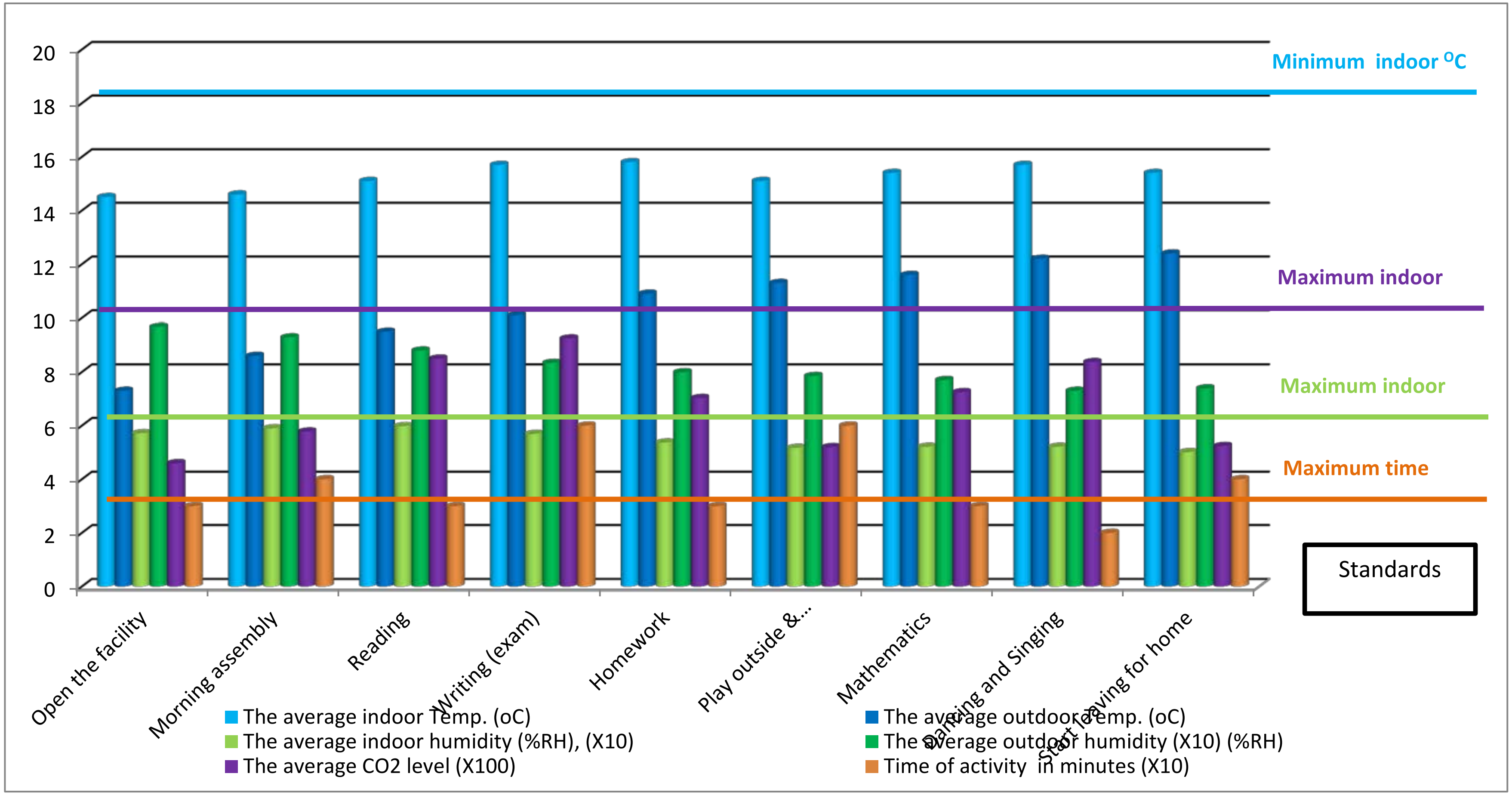


**Figure 307: The average amount of $CO_2$, temperature and the relative humidity inside and outside the (EL) KG building during the KGh and for each activity, 26 Dec 2011[132].**

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[132] While the outdoor $CO_2$ level was been 386ppm and 405ppm

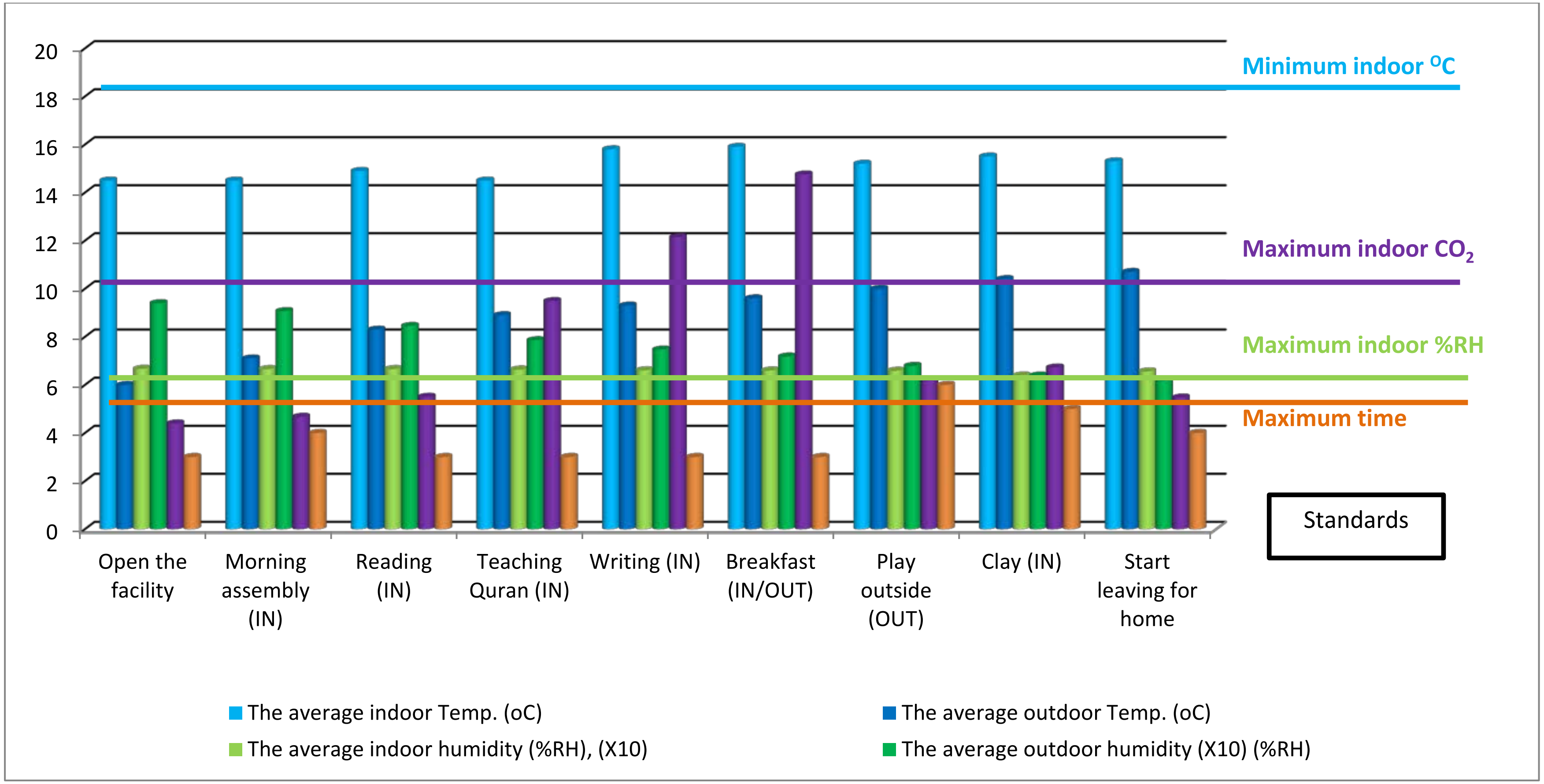


**Figure 308: The average amount of $CO_2$, temperature and the relative humidity inside and outside the (EL) KG building during the KGh and for each activity, 27 Dec 2011[133].**

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[133] While the outdoor $CO_2$ level was been 386ppm and 405ppm

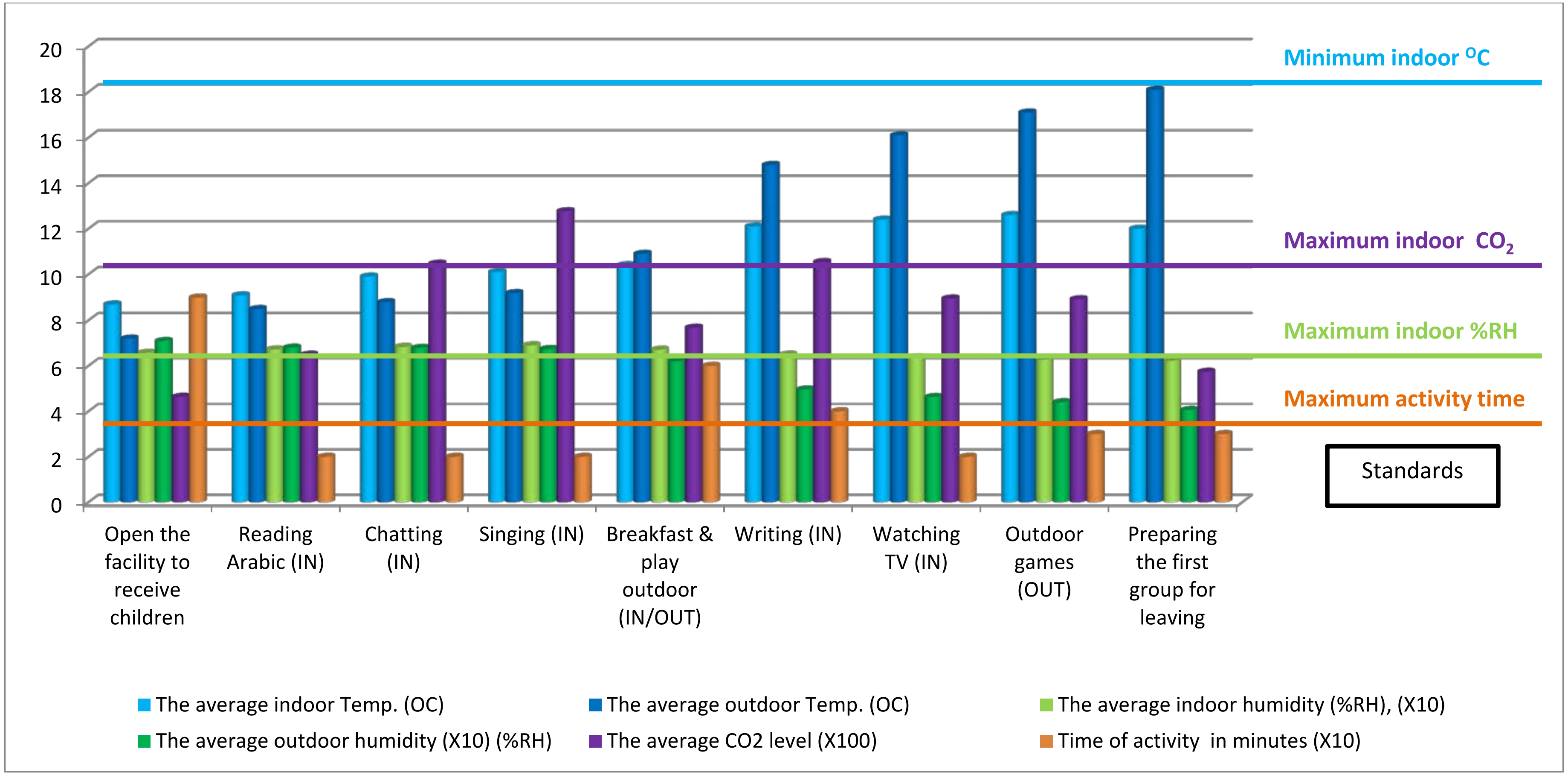


**Figure 309: The average amount of $CO_2$, temperature and the relative humidity inside and outside the (EM) KG building during the KGh and KG activities (28 Dec 2011)[134].**

[134] While the outdoor $CO_2$ level was been 386ppm and 405ppm

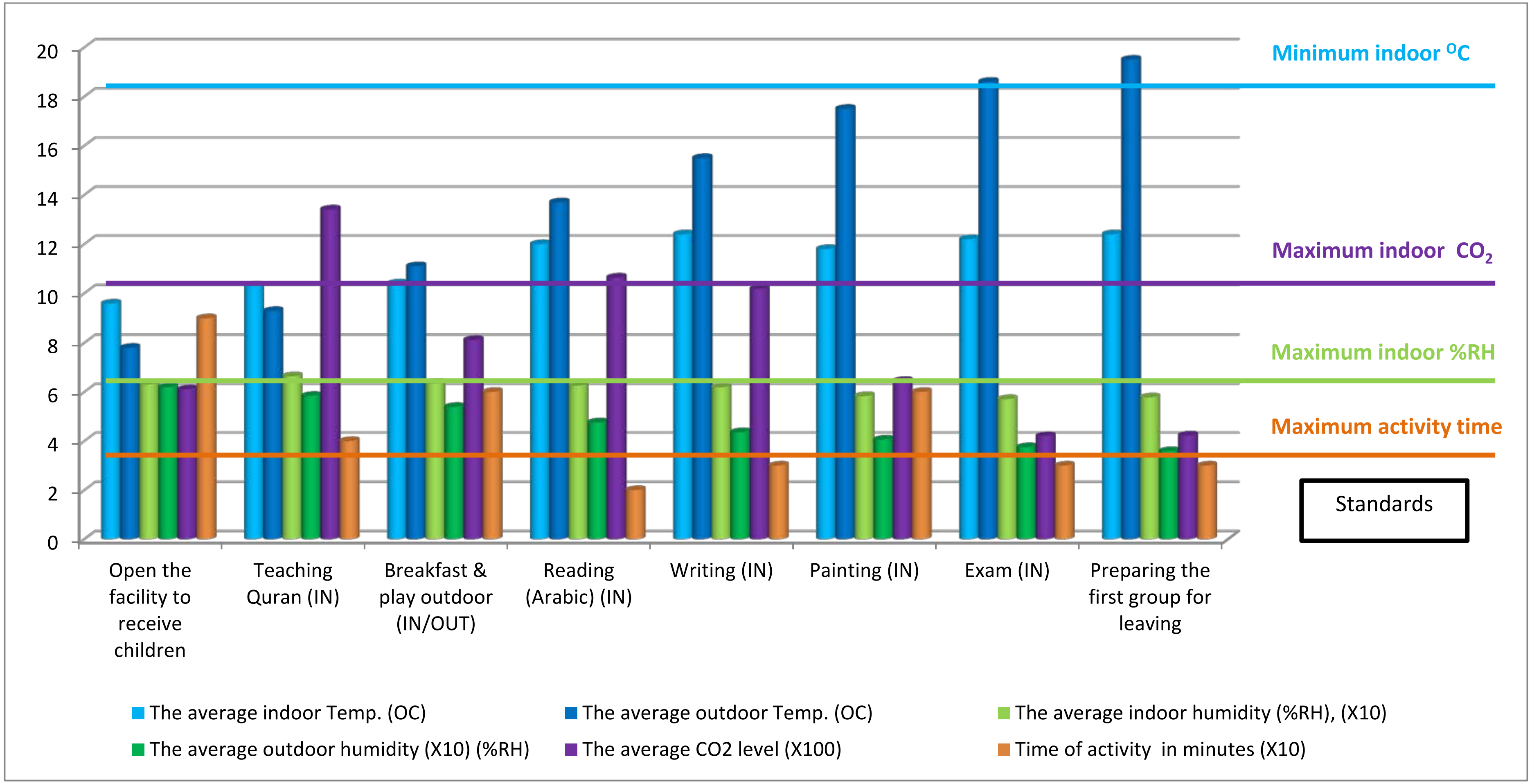


**Figure 310: The average amount of $CO_2$, temperature and the relative humidity inside and outside the (EM) KG building during the KGh (29 Dec 2011)[135].**

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[135] While the outdoor $CO_2$ level was been 386ppm and 405ppm

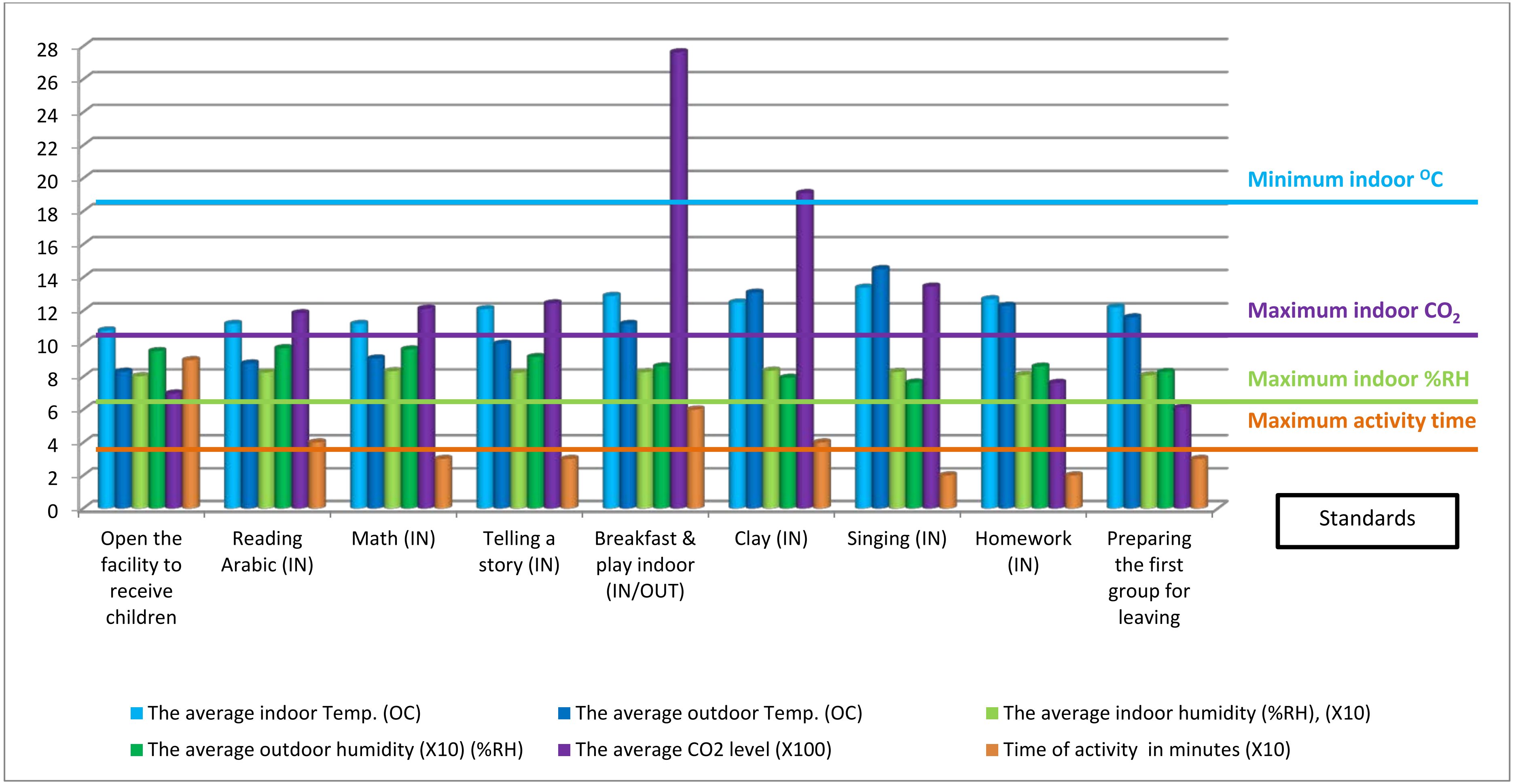


Figure 311: The average amount of $CO_2$, temperature and the relative humidity inside and outside the (EM) KG building during the KGh (2 Jan 2012)[136].

[136] While the outdoor $CO_2$ level was been 386ppm and 405ppm

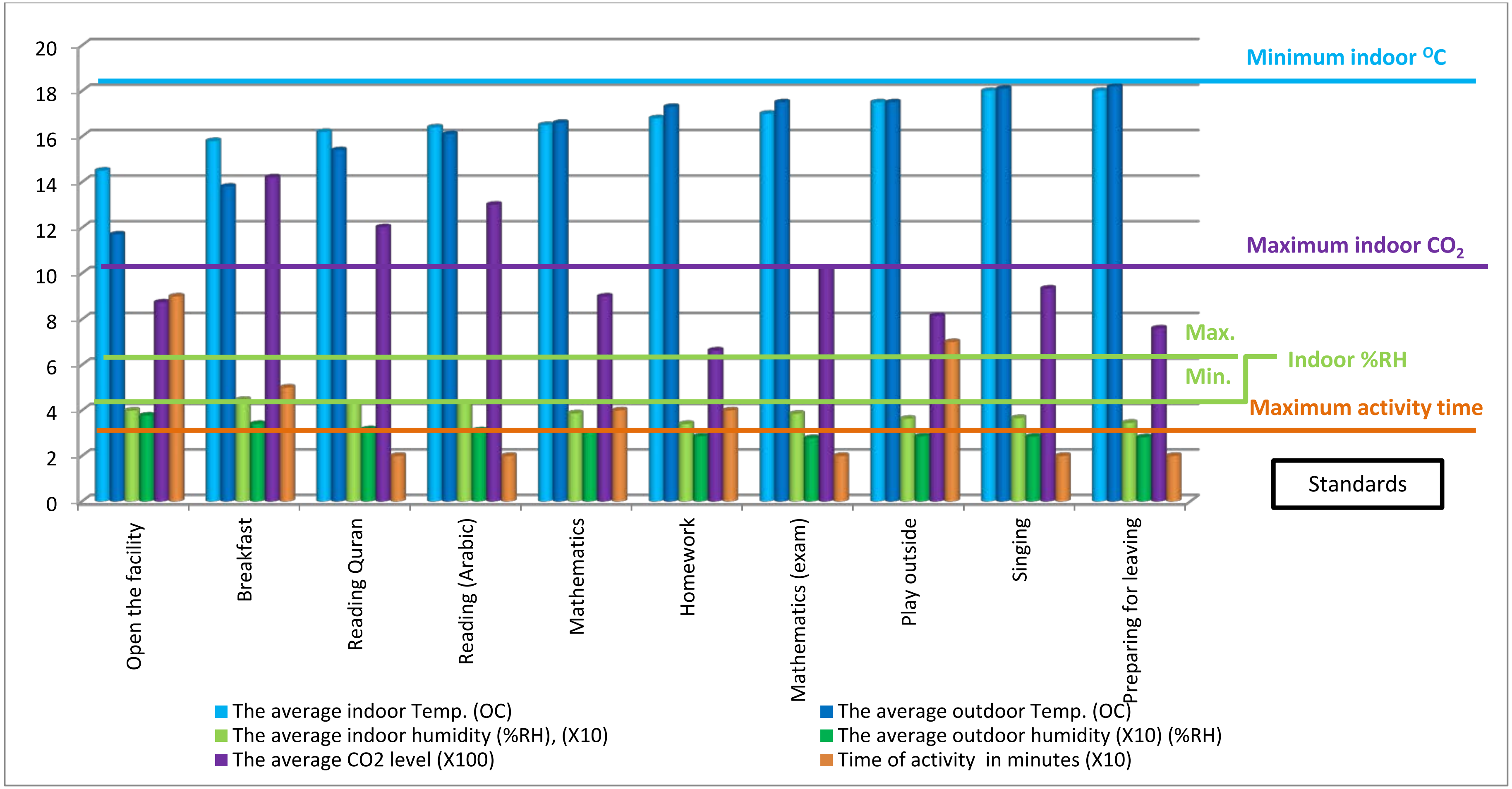


**Figure 312: The average amount of $CO_2$, temperature and the relative humidity inside and outside the (MY) KG building during the KGh (19 Dec 2012)[137].**

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[137] While the outdoor $CO_2$ level was been 386ppm and 405ppm

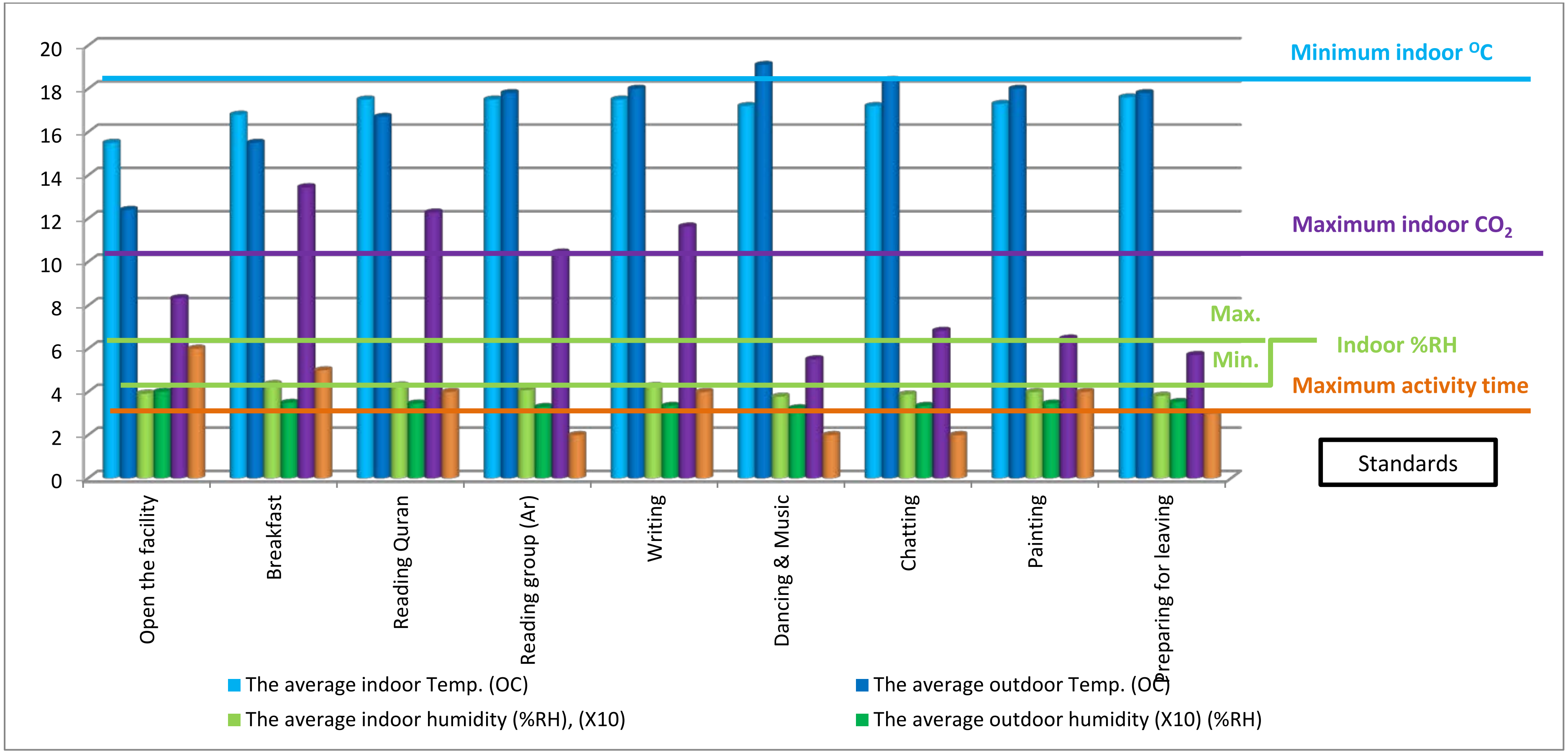


**Figure 313: The average amount of $CO_2$, temperature and the relative humidity inside and outside the (MY) KG building during the KGh (20 Dec 2012)[138], (31 Children were in this classroom on 20 Dec 2011).**

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[138] While the outdoor $CO_2$ level was been 386ppm and 405ppm

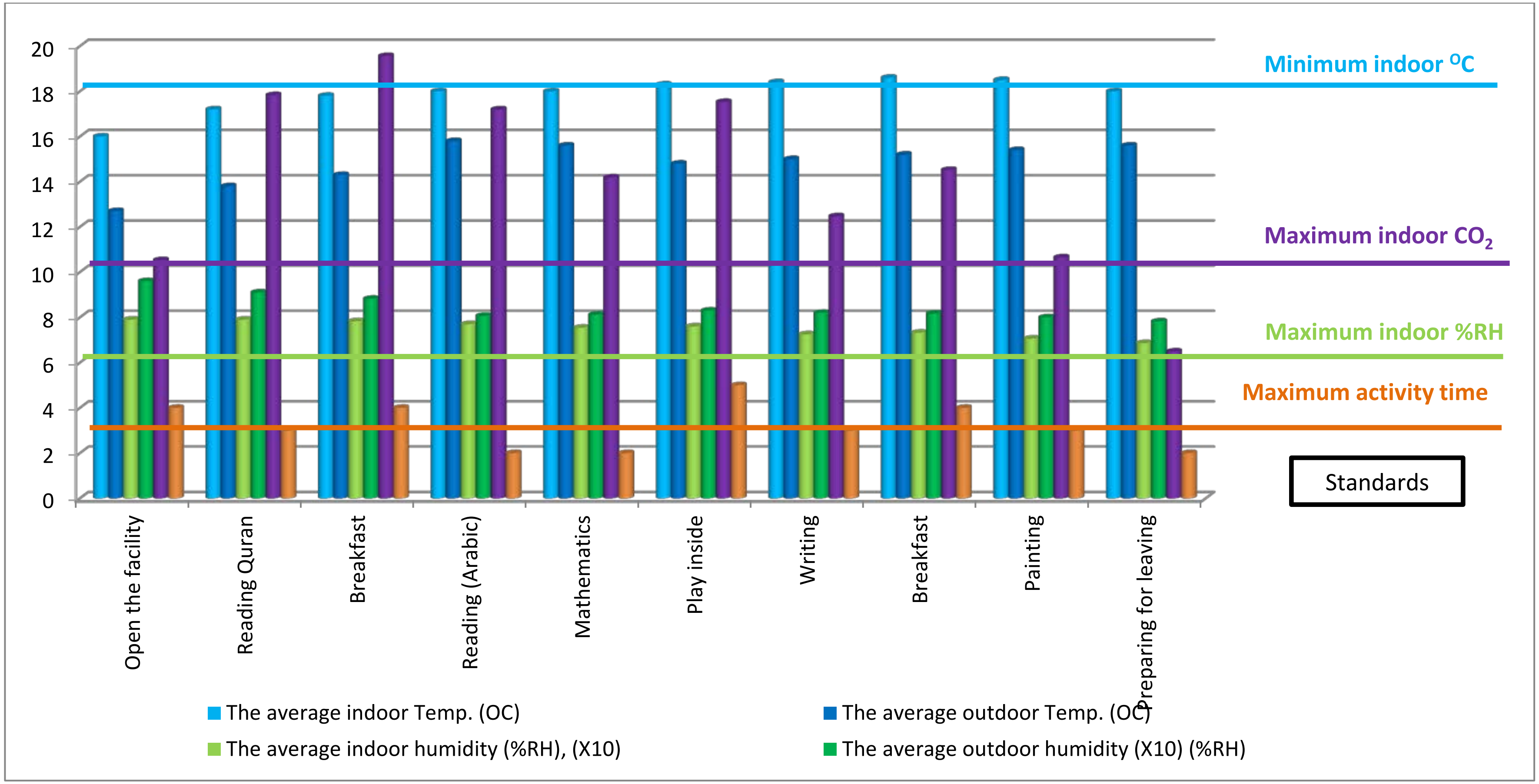


**Figure 314: The average amount of $CO_2$, temperature and the relative humidity inside and outside the (MY) KG building during the KGh (21 Dec 2012)[139], (35 Children were in this classroom on 21 Dec 2011**

[139] While the outdoor $CO_2$ level was been 386ppm and 405ppm