

PLANNING AND DESIGN OF EDUCATIONAL BUILDINGS - SCHOOLS, A CASE STUDY OF ALEXANDRIA, EGYPT.

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ABSTRACT

Today, after the over expanding population densities in our developing countries, the schools have been transformed from being adequate educational environment for teaching the pupils to inadequate and overcrowded schools in which the pupils are restored for certain time of the day. Following to this statement, this research is directed to study to what extent schools are planned and designed in response to the pupils requirements in order to arrive at a better school environment. The study is mainly divided into two parts, the first is concerned with analysing the relationship between schools and pupils of different ages from literature to identify the requirements of the pupils. The second part investigated this relationship in existing schools (public and private) selected as a case study area in the city of Alexandria. From both the theoretical and practical out-put, the factors and dimensions contributing to the problem of school and pupil relationship have been identified and to which a number of solving recommendations were set-up.

INTRODUCTION

School planning and design starts and ends with the pupil. It must be planned and designed to relate in some way or another to the pupil and satisfy his needs. Despite of this fact, there are many schools being built as to restore the pupils instead of creating the environment which suits the pupil through his different ages and works as his second home.

Therefore, this research aims to arrive at planning and design principles for schools. These principles would allow an optimum environment to be created and improving the educational function that school building should provide.

To achieve the aim of the research, the problem was analysed in theoretical context from which general criteria have been identified. These criteria were examined in different existing schools in the city of Alexandria, Egypt. From this examination, using comparative analysis based on theoretical and practical problems, general criteria for school planning and design were arrived at in the form of

conclusion and recommendations. These recommendations can be applied for Alexandria city and regions with similar conditions.

FACTORS AFFECTING SCHOOL BUILDING AND DESIGN:

There are several factors affecting the educational target, some of which are related to the decisions taken by the educational planners and others directly affect the school building and design processes. The later factors are the interest of the research.

1- Social Factors (the society):

The nature of society and it's cultural and social behaviour can affect school building and also the educational level. This effect may be found in two ways. The first is that, the school being built in an environment with low-income groups may need much of maintenance because of the attitude of pupils in such societies. The second influence may

be related to the degree of noise produced from both the people and their different activities, such noise could affect both the degree of absorption of pupils and the ability of teachers to teach.

2- Factors of Site Constraints:

The site with its characteristics and borders has its influence on the educational product. Building schools very close to noise produced from a factory or high traffics can negatively affect the school function. In contradiction, the school being built near or in the community garden can have double benefits of being away from noise (in calm and quite environment) and having the probability of future extension.

3- Climatic Factor:

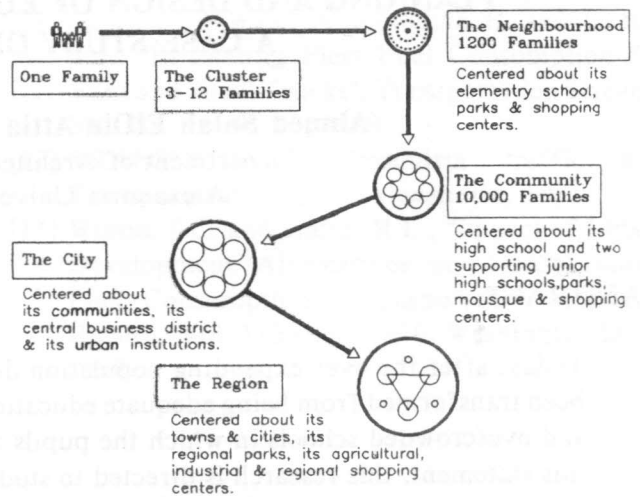
The nature of the prevailing climate may be mild or very hot or very cold and windy resulting in comfortable or uncomfortable climatic conditions and which in turn may positively or negatively affect the pupil and his level of absorption.

4- Economic Factor:

Building a school, provided with the necessary services and supporting facilities can be influenced by the very limited budget of money. This problem may be found in providing the suitable area of land, types of building materials, providing the necessary services and equipment,...etc.

5- Population Factor:

In countries with high population density, schools and subsequently the quality of education can largely be influenced. For example, in Egypt, population is increasing with 1.7 millions every year. This over population density requires either building new schools or increasing the density of pupils in the existing schools and which in turn affect the educational level, considering the right distribution of schools in relation to the number of population,(Figure (1)).



Zahrar, M.M.1973, Challenges of the urban environment.

Figure 1. School's distribution in relation to population.

6- Planning and Building Regulations:

One of the factors affecting school building and design is the planning and building regulations of the area in which the school is to be built. The problem is like when the available land for school building is limited especially when the buildings should be controlled by certain building regulations such as, heights, density, opening, etc.

From the above factors, it can be pointed out that the school designer has a great part to play in improving the educational target. He can design the school which suits the pupil in his different ages. He can put the economic and simple design which answers the pupil's needs, goes into planning and building regulations, avoids the site disadvantages, takes its advantages and adapts the prevailing climate. All these considerations can be considered together in order to design the school which answers the pupils' needs.

It was written by the educational British agent that the school building extended in its purpose from teaching the pupils how to read to teaching them how to live. Since that, the school became an important element with great effect on population. Every thing being practiced in the school helps in

educating the pupils not only in the classrooms but in every place in the school environment. So how can we help in improving this environment? To do so we must be familiar to the pupils needs from their schools.

THE REQUIREMENTS OF THE PUPILS:

The pupils' needs from his school can be divided into two main types of requirements, Figure (2):

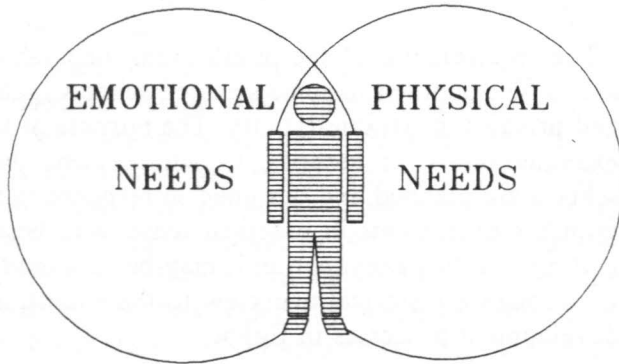


Figure (2). The needs of the pupils from his school.

1- Physical Needs:

Physically, the pupil needs shelter, safe structure, proper sanitation, good heating, proper lighting, adequate space and good sounding conditions.

2- Emotional Needs:

Emotionally, the pupil needs a pleasant environment, secure, friendly and colourful surroundings.

The Pupil and the School Building:

When planners, educators, school boards, architects and others meet, they after a building with a specified number of classrooms and other facilities, a sound structure that will satisfy all building codes and safety requirements, in all cases the produced environment must achieve the satisfaction of the client (the pupil). William Candill (1954) stated in his book (toward better school design), the school building, in addition to the above mentioned target should be within the limits of the money we have to

spend. It is wright, the money should be taken in consideration, but when we talk about creating an environment for the future generation, money should not be a constraint.

The Pupil as an Organism:

Considering the pupil as an organism, in order to function, it needs air and light and food. But if the air took it's negative extreme conditions the organism may feel sick. To some extent the human organism can keep it's thermal balance; it can regulate the amount of light which it receives; and it can filter sound. Within a certain range of environmental changes, the human systems can operate efficiently, but when they are overloaded, a strain is exerted on the organism. One primary school planner and designer, therefore should be to find ways of modifying both the natural and man made environmental conditions. Simply, they should plan and design the school in such a way as to provide comfortable climatic conditions for the pupil.

The Pupil as a Social Being:

Because they are social beings, all the pupils, and particularly those of high school age, are going to gather in small groups about as often as they can and where they can. It is the architect's duty to design the school in such a way to be a place to help keep the children out of hangouts and parked cars and a place they can enjoy themselves during the school day in addition of having their education. The aims and practices of social living must be carried from the home into the elementary school, into the high school, into the college and even in his future life. We as architects have to design our schools for the social pupil as well as the physical pupil and the mental pupil. This can be achieved by carefully design the suitable inner courts and gardens and playgrounds as well as the classrooms and other school design elements.

The School as a New Atmosphere:

The pupils, particularly those in the primary schools are still close to the warm protectiveness of

their homes. They have grown up under the care, love and security offered them by their families. They know very little of the world outside their home's environment and react strongly toward this world when they do meet it. The school environment should be designed to afford a similar environment to that in which the pupil has grown up. They need intimate, cozy schools with welcoming entrances and cheerful, friendly classrooms and colourful surrounding. This applies most obviously to the pupils in the lower grades, but it is important for the older pupils too. The older pupil does not have exactly the same emotional needs that the younger pupil has, but he does need a cheerful, clean, and wholesome atmosphere in the school just as much as he needs it at home and there is no much excuse for disregarding this to him when we design his new school.

Scale and the Pupil:

Every architect must agree that the school building should be differently planned and designed according to the age of the pupil, if we believe that the school should be familiar to him. Every element in the school (including open spaces and classrooms) must be adapted to the scale of the pupil. In the classrooms, ceiling heights, walls materials and colours, windows height and length and the equipments and furniture should be treated in different way, adapting to the child scale. He can move with more ease and more peace of mind. This scale adaptation should also be expressed in the school's open spaces (courts and playgrounds), in the way it is planned, designed and furnished. The pupil then can feel that the school is created for him, and he will love to go to and be more self-reliant and do more and better work.

Colour and Texture and the Pupil:

The school colour and texture are very important for the feeling of the pupil (according to his age). It is not hard to imagine what the feeling of the school pupil must be when he is seated in the middle of a brand new, perfectly lighted but cold and unfriendly classroom. The pupils like colour surrounding that make them impressed and happy. If colour can help

the pupil to like his school and learn better in it, there is no valid reason it should not be used for that purpose. Creative architects can also bring inexpensive outside materials to the inside of the buildings with considerable success in producing colourful and highly textured spaces. The design of walls, doors, floors, and ceilings should show consideration for the pupil's emotional needs and his other needs.

THE CASE STUDY:

ALEXANDRIA CITY, EGYPT:

The requirements of the pupils from their schools are to be examined in some selected schools (public and private) in Alexandria city. The purpose of this examination is to identify to what extent these schools are planned and designed in response to the pupil's requirements in practical sense. But, before getting into this examination it may be necessary to go through a historical overview to the educational development processes in Egypt.

THE DEVELOPMENT OF EDUCATIONAL SYSTEM IN EGYPT:

1. Before the Revolution of 1952:

With the beginning of the industrial revolution in Europe, Egypt started to develop the education and schools. But, because of the English presence in Egypt, many schools were closed up and education was only limited to the rich people of the society. Some Egyptian educational revolutions came up by the leaders Mostafa Kamel and Mohamed Farid for building schools for the public. This continued until the 1923 station which appeared and called for the free education and establishing public schools. Education was developed in the period between 1923 to 1952 revolution, but this period was characterised by segregation between people; the free public education, and those who were able to pay had the primary education influenced by the European style and concept.

2. After the Revolution of 1952:

After the revolution of 1952, the problem of

educational buildings has been raised up, because of the continuous desire for education. The Ministry of Housing was responsible for constructing the educational buildings, but the problem at that time was limited in the prototype designed schools using finishing materials of a very poor quality. Additionally the number of schools at that time was only enough to absorb half of the pupils all over the country, which was 3,000,000 pupils of both sex, this raised the need for about 350 school plants to be built, each had to be designed for 500 pupils.

The responsibility of constructing the educational buildings was committed to the Educational Buildings Institution (established in 1958) and which constructed about 1625 primary schools and 104 schools for general and technical education. In 1965 this institution was transferred as a public agent under the title of Arab Bureau for Design and Technical Consultations. In 1967 (after the war), the problem of education in Egypt has come up to its extreme situation especially when the educational buildings were used for accommodating the migrants coming from canal area. In 1973, during the open handed era, the problem was exceeded, because of the moving many qualified teachers outside the country, to work permanently in the Gulf area, at that time the idea of private schools started to take place related to religious or national agencies. In 1988, the Public Organization for Educational Buildings was established to be responsible for planning, supervising construction process, upgrading and determining the estimated needs of the educational buildings.

3. *The Existing Situation of Educational Buildings:*

According to the census of 1985 the stage of primary education was suppose to take care of about 6 million pupils, while the available buildings at that time absorbed about 79.5% of that number, which means that about 1.5 million pupils are outside primary schools. For the high schools 2.1 million pupils (from 12-15 years old) are needed to have their education, while the available schools absorb only about 14.3% of this number which means that 1.8 million pupils have no places. It also means that there are about 3.36 million of pupils (from 5-15 years old) have no places in the public schools. The

census have also indicated that the deficiency of the educational level is related to the following conditions:

1. Buildings are used as schools but never been designed for being a school plant, many of them work for two shifts or more during the day.
2. Some school buildings are threatened with collapse and either need to be maintained or replaced by new school buildings.
3. Many school plants have necessary services of very bad quality such as, toilets, electricity, drinking water, ..etc.
4. School plants are planned and designed with no criteria and principles that have to be found in this type of buildings.
5. The shortage of budget allocated for both maintaining and constructing schools.
6. The shortage in building materials in the market in addition to their being very expensive.
7. The shortage in labour forces and qualified workers in the building field.
8. The difficulties of having available and suitable sites for building schools, especially if inside the city.

SCHOOLS IN ALEXANDRIA:

In Alexandria, there are 111 pre-schools, 637 Primary schools, absorbing 435,754.0 pupils, seating in 8760.0 classrooms, 286 elementary schools of 213,928.0 pupils seating in 4910 classrooms, 79 secondary schools teaching for 51,674.0 pupils seating in 1297 classrooms and 64 schools teaching technical studies for 50,926.0 pupils seating in 1505 classrooms,(tables 1,2,3). It means that the average number of pupils in the classroom for both primary and high schools is 50 pupils, but in the public schools and some private schools, this number is elevated to 60 pupils and in some other private schools the number is decreased up to 45 pupils. However, from these census the number of pupils in the classroom is high in relation to the theory of school design which determine the number by 32 pupils in the classroom in order to afford the appropriate in-door and out-door environment for teaching. Many of the schools of different ages have also wrongly been located and distributed either in

terms of population density or inadequate selected sites or both. Additionally, many of the schools may be successfully located but designed in a way does not fulfill the pupils requirements. In the following sections some schools of both public and private have been examined in order to identify to what extent they are functionally working and planned and designed in response to the needs of pupil through his different ages. It is also intended to illustrate the main factors causing the problem of the schools of being as a place prepared to restore the pupils instead of creating the school building which make the pupil feels comfortable during his school day.

1. Private Schools:

1.1. English Girls College (E.G.C.):

This is one of the private schools teaching and taking care of pupils from the nursery to the secondary stage, (Figure (3)), It is located in Shatby area on land of about 20 feddans surrounded by three streets. It was built in 1940 and designed by an English architect, and it was therefore designed with some spirit of the English architectural style. The layout plan of the school is mixing between the closed-off and open plan type of school buildings. It was firstly built to teach for 50 pupils, this number expanded to 5000 pupils in 1991. Since 1940 till 1991, to absorb the continuous increasing number of pupils and prevent the crowding in the classrooms, some new buildings have been constructed inside the school site. By applying the planning and design criteria which would allow an optimum educational environment to be created for schools, we can find the following:

1. The school is located away from pollution and noise sources as it is surrounded by streets with reasonable traffic density, in addition to its vast site area which make it quite and private environment.
2. It is easy to reach as it is located in the middle of the city and surrounded by three streets.
3. The site area allowed for future extension without reducing the needed open spaces and playgrounds (from 6 to 7 sq.m. per pupil).
4. The external spaces were designed containing

playgrounds, green areas, walkways, swimming pool, all of which provide pleasant and cheerful environment for the pupils.

5. The old building (original school building) was designed and built around internal court surrounded by classrooms of single loaded corridor in addition to the vast open areas and playgrounds in the external court.
6. The school buildings contain classrooms, necessary services and supporting facilities, such as, gymnasium, swimming pool, auditorium,...etc.
7. The classrooms and laboratories are oriented to the north and north east, which is the likely orientation for classrooms in Egypt, considering the prevailing climate. Also, the area of the classrooms is designed according to the school design criteria in terms of size, lighting, ventilation, furniture,...etc.
8. The school building was simply designed using simple facades with a considerable height (3 floors) using pitched roofs and covered with red roof tiles in some areas making the building's appearance pleasant for the pupils.

Around the external court, three buildings have been added , the first (1970) and the second (1978) were to some extent poorly designed and not in harmony with the old buildings, while the third building (1991) was designed matching with the style of the old building using the same architectural vocabulary, colours and form. Generally speaking, this school with its buildings and open spaces provide the necessary physical and emotional requirements to the pupils and which have to be highly considered when building a school plant.

1.2. Smouha Language School:

It is located in the middle of housing blocks on an area of about 2000.0 square meters, (Figure (4)). The school was an old villa (built in 1950) of three floors. An additional U-shape building was built in 1986 of five floors around the old building, leaving an internal court in between. The area of the court is very small (about 15 x 15m.) in relation to the number of pupils attending the school and which is about 2000 pupils seating in 44 classrooms. By applying the planning and design criteria for this

school we can find the following:

1. Being located in the middle of housing cluster and very close to houses, the school may cause disturbance and noise which some time affect the comfort level of the surrounding residents.
2. The school is directly opened to the streets which make it unsafe for the pupils especially during in and out times.
3. The area allocated for the school is very small and does not allow for future extension. It also does not provide the necessary out-door spaces and playgrounds. The only available court works as a place to restore the pupils instead of being an open, cheerful and proper out-door environment.
4. Some of the classrooms are probably located to the north, but the majority are oriented to the south and south west without having any means of sun protection which results in inconvenience atmosphere inside the classroom.
5. The classrooms are poorly designed in terms of, area, lighting, space furniture, colours and finishing materials.
6. The design dimensions of the school buildings with their style and heights are not designed in relation to the pupil scale, this resulted in the school environment of being unpleasant and scareful for the pupils.
7. In terms of building regulations, the school buildings illustrate no respect and that can be noticed in building heights in relation to the left open spaces.

The school is one of the private examples from which the target of being educational plant has been transferred to an illegal investment purpose. The planning and design criteria which would allow an optimum educational environment have totally been dismissed in this example of schools, (Figure (4)).

2. Public Schools:

2.1. Moharam Bey School:

The school is one of the public schools, teaching for elementary stages, (Figure (5)). It is located in Moharam Bey area, on three streets, one of which is the main road (El-Rassafa road-20m. width) with high traffic and where many transportation networks are run, such as, public buses, tram and cars. The

school was firstly established in an old villa using it's private open space and garden as playgrounds for the pupils. Later on, new blocks of classroom buildings have been constructed of three storeys each in the open spaces leaving no out-door space for the pupils activities. Today, the school (the old and new buildings) is overcrowded so that some inadequate spaces have been used as classrooms such as, the stores in the basement and areas under the balconies directly opened to the garden with no means of protection and privacy.

By applying the planning and design criteria for this school we can find the following:

1. Locating the school directly on the above mentioned road with its high traffic conditions is inappropriate decision which make the pupils do not feel safe and secured, in addition to the level of noise caused by that traffic element.
2. The selected site between congested built-up area does not provide any chance for future extension.
3. The school lacks appropriate open spaces and playgrounds in which the pupils can practice their out-door activities. They therefore consider the school atmosphere as an unpleasant and unlikely environment to go.
4. The school lacks the necessary services and supporting facilities, such as, toilets, cafeterias,...etc., while the available toilets are in a very bad condition.
5. Most of the classrooms in both the old and new buildings are wrongly oriented in terms of the prevailing climate. They are also poorly designed in terms of area, lighting, furniture and finishing materials.
6. There has no even respect been given to the building regulation. This can be clearly seen in building heights and the very limited spaces in between.
7. The appearance of the school buildings is not appropriate and welcoming pupils. It is an ugly composition of irrelevant building styles.

The school is one of the very inappropriate educational environment for pupils. It has wrongly been located and designed. This example indicates that using an existing building (villa) is a wrong decision, as building a school plant must be related to certain criteria and principles in order to achieve the successful environment for educational purpose.

2.2. Smouha Elementary School:

It is one of the public schools, constructed in 1978 to teach for pupils of elementary stage, (Figure (6)). It is located in Smouha district on an area of about 4 feddans, near to the university students hostels. The school is one of the closed-off types of school plan, it consists of wings of single loaded corridors (3 story height) between which a reasonable out-door space is found. By applying the planning and design criteria for this school we can find the following:

1. It is located in a reasonably quite area, away from heavy traffics, pollution and noise sources and the site is easy to reach.
2. The school buildings are designed around two courts, connected to each other through the ground floor of one of the wings, providing an adequate and well ventilated out-door space for the pupils activities.
3. All the classrooms are oriented to the north, north east and north west (the likely orientation for classrooms), also the classrooms area suits the number of pupils.
4. The school buildings are not in conflict with building regulations in terms of heights and open spaces.
5. In terms of the architectural aesthetic values, the school buildings are considered a prototype design which may give a monotonous feeling. Apart from the architectural aesthetic values the school can be considered as a good example if regularly maintained, and the number of pupils is considerably kept in relation to the area of the classroom.

The Role of The National Organization of Educational Buildings in Alexandria:

This organization was established to take the responsibility of:

1. Preparing general comprehensive plan for educational buildings (schools) all over the country in relation to the needs of each governorate according to population density, cultural, social and environmental conditions.
2. Setting-out architectural programmes, planning and design criteria for schools in different educational stages.

3. Allocating the needed budget for maintaining, buying and selling lands for school purpose in each governorate.
4. Providing schools with the required furniture and equipments.

That was the purpose of establishing the NOEB, but the question that can be asked here is how much has the role of this organization been effective? The answer of this question can be concluded in the following:

1. Proposing design studies for some examples of schools for different ages as shown in, (Figure (7)) of one school which has been built in Alexandria (Abu-Keer).
2. Constructing new buildings as extensions in the left open space in some of the existing schools.
3. Maintaining and redeveloping some of deteriorated school buildings.

From the above it can be concluded that the role of the organization has not been entirely effective in solving the problem of schools in Alexandria. In terms of the proposed studies, the examples are planned and designed according to the criteria of planning and design of school buildings, but the area allocated for the school for example, is not according to the relation between the number and pupils to the total area of the school including open spaces as mentioned in the proceeding sections. Also, constructing new classrooms buildings as extensions in very limited open space of the existing schools has negatively affected the quality of the educational environment in these schools as happened in Moharam Bey school, (Figure (5)). Additionally, there are many of both public and private schools have been built regardless of any planning and design criteria for school buildings, while there is no an effective decision is taken against these schools from the organization. This irresponsible action also encourage the continuous constructing examples of such inadequate school plants. But the role of the organization was positively found in maintaining some of the old school buildings and supplying them with the required furniture and equipments.

CONCLUSION AND RECOMMENDATIONS:

In this research, the aim of the study was to analyse and examine to what extent schools in

Alexandria city are planned and designed taking into consideration the fulfillment of the pupil's needs and requirements through different educational stages. To arrive at this target the issue of school planning and design was discussed in literature to identify the requirements of pupils from their schools. The identified requirements have been investigated in selected schools and highlighted the issues causing the deficiency in schools in the city of Alexandria, for solving this deficiency the study is ended with planning and design principles as follows:

1. The schools in Alexandria need to be redistributed in terms of the number of pupils reach to the standard number of pupils in each classroom (this number is from 32-35 pupils).
 2. Talking about each district in the city, in certain districts, the number of pupils in the classrooms is considerable in some schools, while in other schools this number is overcrowded, which means redistribution of the pupils on the level of the same district is also required.
 3. There are many schools (as described in the text), are located and designed in a way not adequate for educational purpose, such schools should immediately be closed off or redeveloped according to the planning and design criteria for schools.
 4. To achieve the above recommendations, new schools are needed to be built in a proper planning and design dimensions.
 5. Preparing a yearly plan for maintaining the school buildings according to the conditions and needs in each district is also required.
 6. The recommendations 3 and 4 must be implemented and followed-up in a restricted and effective manner by the NOEB.
 7. Encouraging the technical education by building new schools and improving the existing ones in order to release the pressure on the schools of public education.
 8. Both new and existing schools should be planned and replanned, designed and redesigned to fulfill both physical and emotional needs of the pupils.
- a- The selected site must be away from pollution and noise, easy to reach, allow for future extension without reducing the required out-door space . Also the total area of school site must be related to the final number of pupils as (4.5 sq.m.

for school of less than 250 pupils and 7.2 sq.m. for school of more than 250 pupils, NOEB, 1990).

- b- The school plan may be better to gather between the closed-off and open-plan of design schemes.
- c- Out-door space must be suitable in area, provided with playgrounds, green areas, walkways and open and shaded spaces.
- d- Classrooms should be properly designed in terms of area (1.25 sq.m. per pupil), orientation, ventilation, natural lighting, insulation, finishing materials (durability, texture, colour, ...etc.) and furniture and equipments.
- e- The school design should be including the necessary services and supporting facilities, such as, toilets, cafeterias, gymnasiums,...etc.
- f- In all the above issues, design elements must be organised in a proper functional relationships.

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Table (1). The number of schools, classrooms and pupils in different educational stages in Alexandria, 1990/1991.

Educational stages	Number of		
	Schools	Classrooms	Pupils
Pre-school stage	111	623	29,791.00
Primary stage	637	8137	405,963.00
Elementary stage	286	4910	213,928.00
Secondary stage	79	1297	51,674.00
Technical schools (industrial)	18	658	21,245.00
Technical schools (commercial)	45	687	27,305.00
Technical schools (agricultural)	1	61	2,376.00
Total	1277	16475	752,282.00

Ref. Alexandria Governorate-Educational Administration, 15 Nov., 1990.

Table (2). The number of schools, classrooms and pupils in different educational directories (districts) in Alexandria, 1990/1991.

Educational Directories	Number of			No. of pupils/classroom
	Schools	Classrooms	Pupils	
1. El-Montazah	211	3118	167,766.00	53
2. East	254	3875	191,481.00	49
3. Central	273	3437	138,994.00	40
4. El-Gomrok	96	1001	38,299.00	38
5. West	128	2011	93,422.00	46
6. El-Amria	130	1392	67,720.00	48
Total	1092	14834	697,682.00	

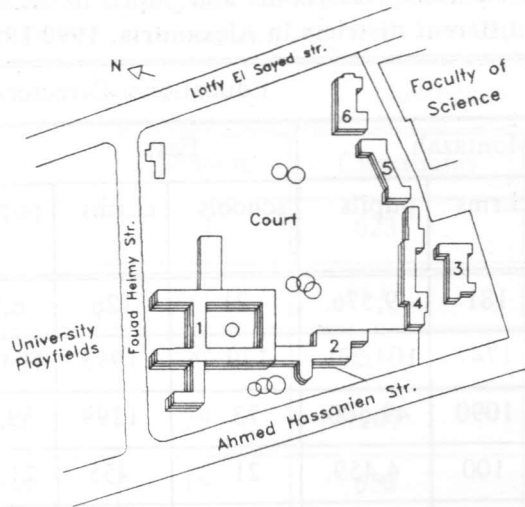
Ref. Alexandria Governorate-Educational Administration, 15 Nov., 1990.

Table. (3) The number of schools, classrooms and pupils in different educational stages- in different districts in Alexandria, 1990/1991.

Educational Stages	Educational Directories								
	El-Montazah			East			Central		
	schools	cl.rms	pupils	schools	cl.rms	pupils	schools	cl.rms	pupils
Pre-school stage	32	181	9,576.	21	126	6,813.	38	227	10,073.
Preparatory stage	116	1747	104,231.	139	1995	103,588.	144	1700	71,063.
Elementary stage	56	1090	49,500.	73	1299	59,560.	63	1023	42,144.
Secondary stage	7	100	4,459.	21	455	21,520.	28	437	15,714.
Total	211	3118	167,766.	254	3875	191,481.	273	3437	138,994

Educational Stages	Educational Directories								
	El-Gomrok			West			El-Amria		
	schools	cl.rms	pupils	schools	cl.rms	pupils	schools	cl.rms	pupils
Pre-school stage	10	34	1,313.	6	19	720.	4	36	1,296.
Preparatory stage	58	562	21,796.	82	1135	57,469.	90	904	46,857.
Elementary stage	21	321	12,220.	33	709	31,050.	30	391	17,757.
Secondary Stage	7	84	2,970.	7	148	4,903.	6	61	1,809.
Total	96	1001	38,299.	128	2011	93,422.	130	1392	67,720.

Ref. Alexandria Governorate-Educational Administration, 15 Nov., 1990.



- 1- Secondary Classroom Building & Administration.
- 2- Nursery Stage.
- 3- Primary Stage.
- 4+5 Primary Stage (Extension).
- 6- Preparatory Stage (Extension).

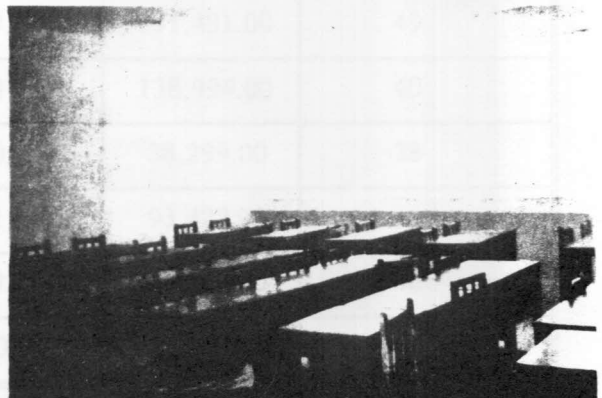
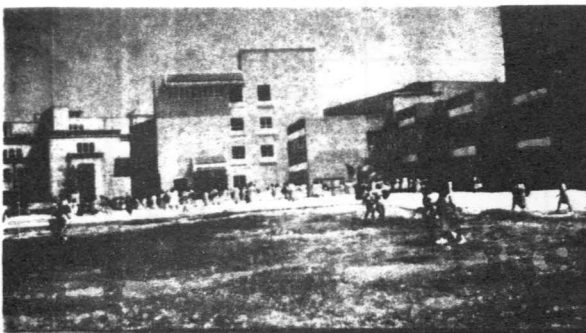
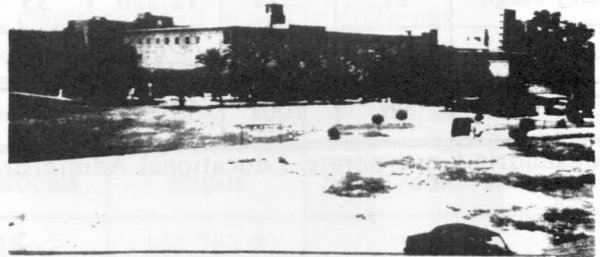
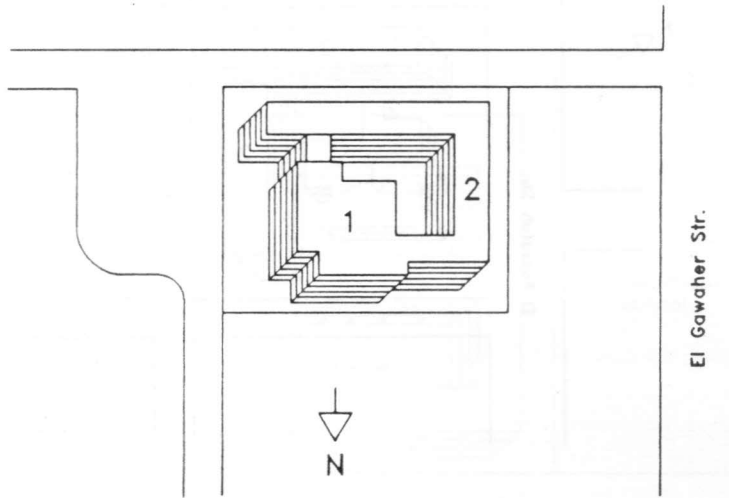


Fig.(3) English girls school, EGC, (private school).



- 1- Administration & Upper extended Classrooms.
- 2- Classrooms Build.(Ext.).

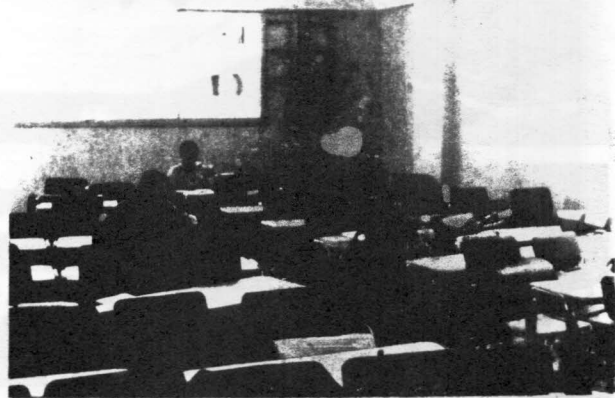
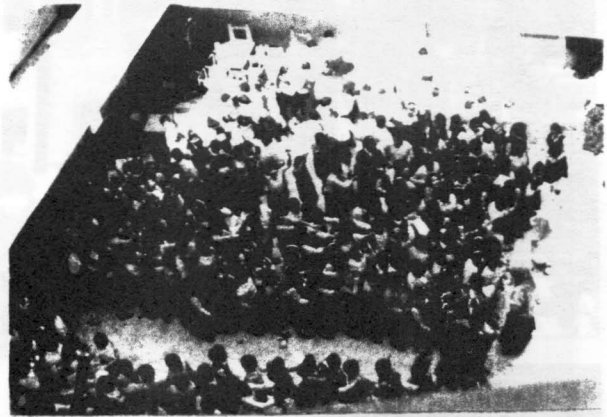
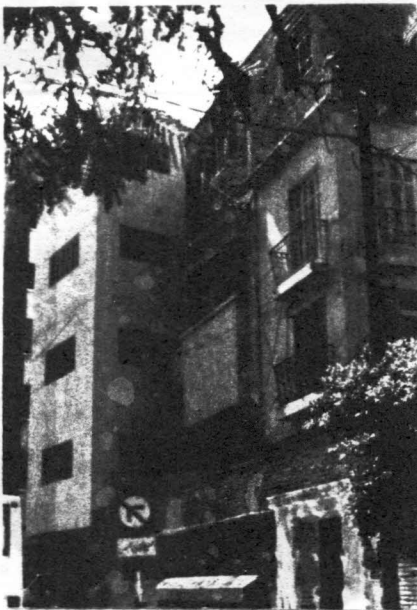
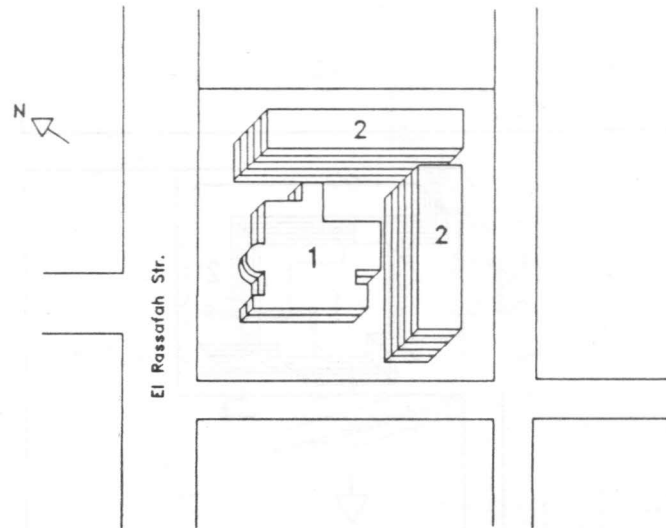


Fig. (4) Smouha language school, (private school).



1- The old building (Adminstr. & classrooms).
2- Classrooms (Extention).

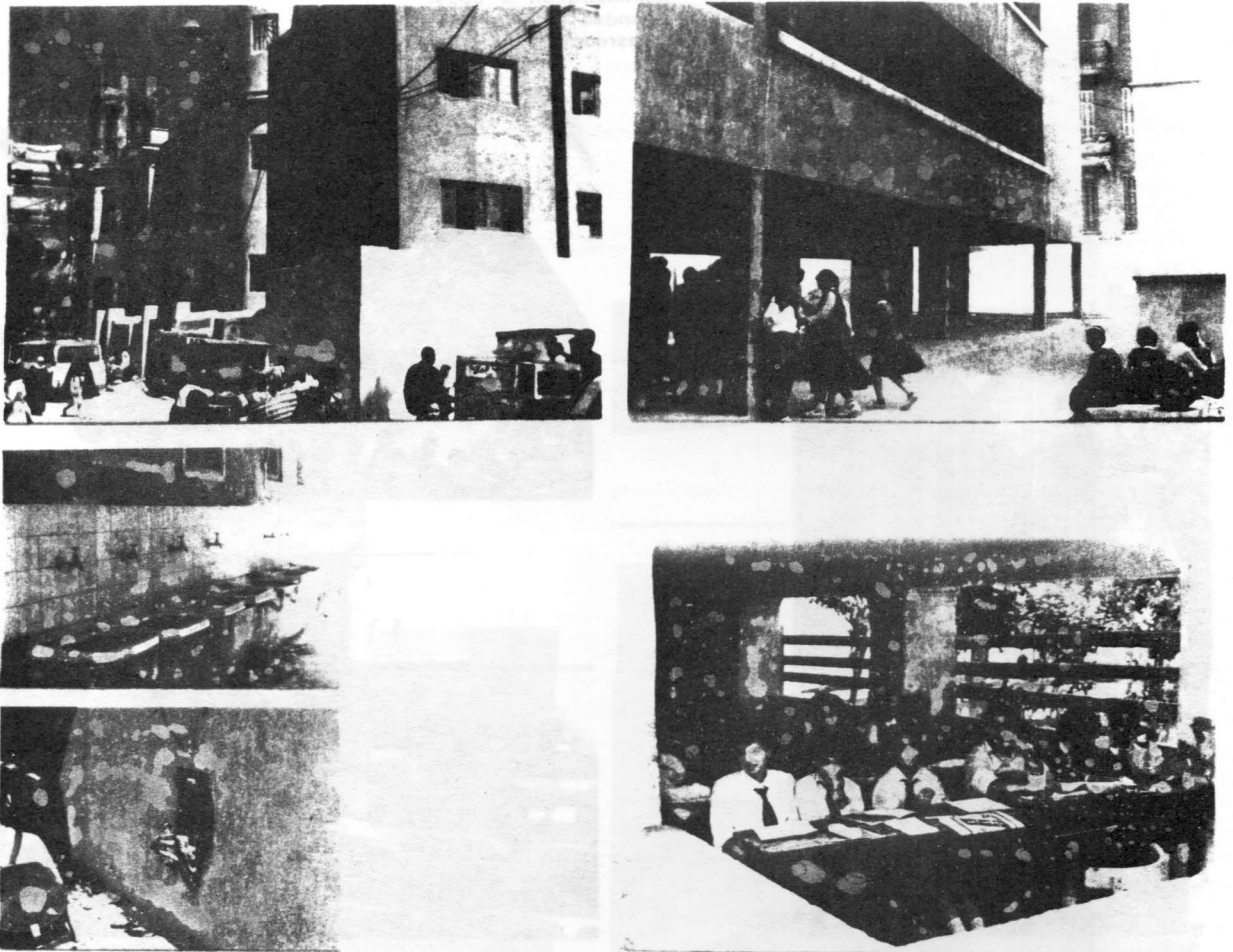
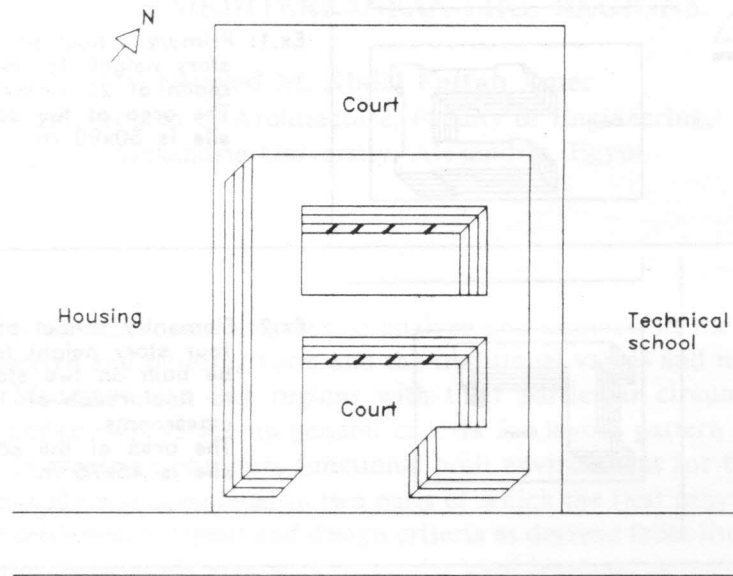


Fig. (5) Moharam Bey School, (public school).



University Hostels

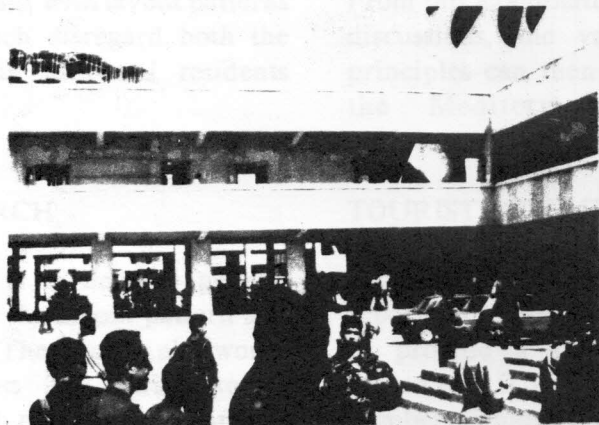


Fig. (6) Smouha elementary school for technical education, (public school).

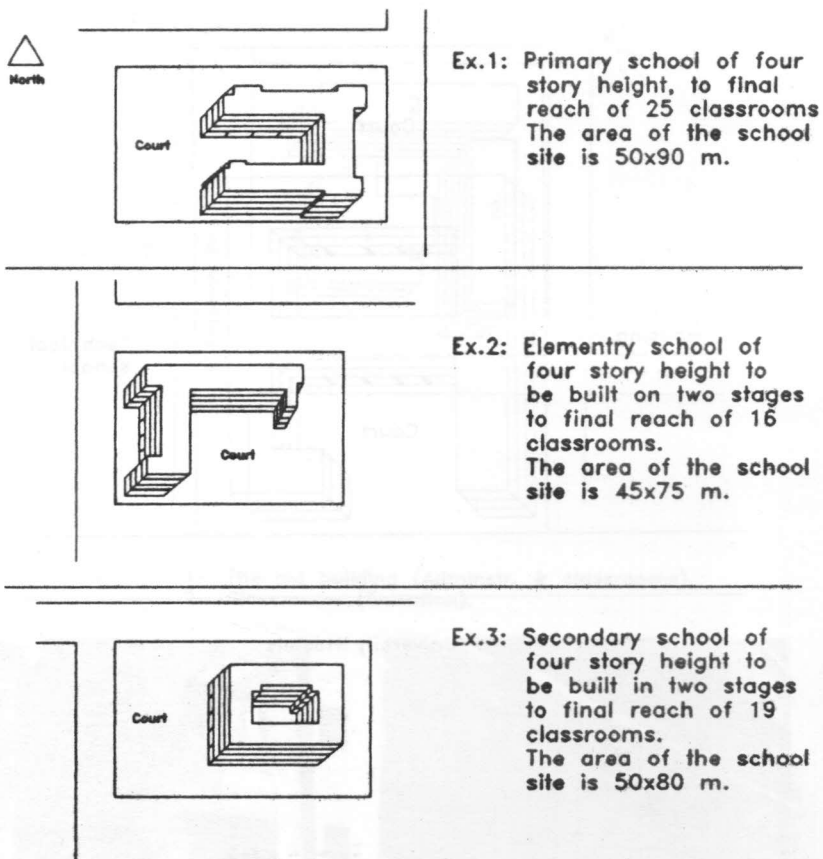


Fig.(7) Design types of schools of different stages proposed by NOEB.