Ain shams university – Faculty of Engineering

Department of Architecture

Designing for learning

Studying Outdoor Environment of Primary Schools in Egypt

A Thesis presented in Partial Fulfilment of the Requirements for Master of Science Degree in Architecture Engineering.

Submitted by

Alaa Abd-Elmoniem Abd-Elraziq El-Telwany

BSc in Architecture 2014 – Ain shams university

Under Supervision of

Prof. Dr. Muhammed Ibrahim Gabr

Professor of Architecture, Faculty of Engineering, Ain Shams University

Dr. Tamer Samir Mahmoud

Assistant Professor of Architecture, Faculty of Engineering, Ain Shams University

Dr. Ayman Muhammed Assem

Assistant Professor of Architecture, Faculty of Engineering, Ain Shams University

2020

Disclaimer

This thesis is submitted to Ain Shams University M.Sc. degree in architecture.

The work included in this thesis was carried out by the researcher at the department of architecture, faculty of engineering, ain shams university, during the period from 2016 to Jan. 2020.

no part of this thesis has been submitted for a degree of a qualification at any other university or institute.

/ /

Alaa Abdel-Elmoniem

Signature

Acknowledgment

" اللهم انفعني بما علمتني ، وعلمني ما ينفعني ، وزدني علما ، والحمد لله على كل حال "

With setting the last final touches, I would thank god for being able to complete my research with success. Primarily, I would like to express my special thanks to Dr. Muhammed Ibrahim gabr whose valuable guidance has been the ones that helped to patch the path of this work. In addition to, DR. Ayman Assem and DR. Tamer Samir for their suggestions and instructions that served that as the major contributor to complete the study.

Then, I would thank my great father (Eng. Abdelmoniem EL-Telwany) and supporter mum (Mrs. Elham Hamam) without your efforts there is nothing come to light.

Finally, I am proud of the final thesis that represents the hard work of the last two years and wishes to be valuable work in my life.

Abstract

Primary education is a key factor in developing children's character and fulfil their special needs during schooling life. Subsequently, governments and educational organizations pay significant attention to this educational phase. Furthermore, the quality of the educational environment impacts educational performance. In most cases, The Egyptian schools underestimate the importance of the design quality of the schools' outdoor environment unlike educationally developed countries especially those interested in outdoor education. Thus, it is essential to highlight the role of the natural environment and the welfare of the educational outdoors environment for children in schools among urban planners, designers, and governmental authorities.

Unfortunately, the national Egyptian guidelines for schools' outdoor environment set by GAEB (General Authority for Educational Buildings) lack the design principles of schools' outdoor environment. These schools' outdoor areas considered a complimentary area for the school building only.

The study adopts that the ***design language of outdoor spaces is ONE of the means of educational tools.*** Hence, this study aims to build design principles for an educational outdoor environment for primary schools. These principles study the relationship between the educational settings children's development dimensions and the characteristics of the children's outdoor environment. The thesis classified these environment's characteristics into three categories: the motivations factors, the usability factors, and the legibility factors to create an active environment for children.

In addition, the compatibility of the principles relative to the governmental Egyptian and UK's design guidelines of the primary schools' outdoor environment was analyzed. These guidelines of Egyptian and UK were analyzed based on the design principles. This analyzes identified the strengths and weaknesses in supporting the outdoor educational environment. This led the study to analyze these impacts on real schools' models of both countries. The UK represents different methods and tools to apply these principles other than Egyptian guidelines that represent general lack in applying these principles.

Keywords: children's outdoor Environment – primary /elementary schools – outdoor education – children development.

Table of Contents

Introduction..... i
1 the Egyptian education system..... ii
1.1 The Egyptian education stages iii
1.2 The role of the primary education stage..... iii
1.2.1 The Egyptian primary education objectives iv
1.2.2 The quality of the Egyptian primary education stage iv
2 the outdoor environment of egypt.....v
2.1 The Egyptian school's outdoor environment.....v
2.2 The school's outdoor environment research in Egypt.....vi
3 Research problem and objectives..... vii
1.1 Research problem..... vii
3.1 Research Objective..... vii
3.2 Procedural Objectives vii
4 Research Methodology..... vii
5 Research structure.....12
Building knowledge.....1
1. Chapter 1: The relationship between environment and education 2
1.1 Human-Outdoor environment relationships 3
1.1.1 The 'nature experience' is the main approach to shaping the outdoor environment.....4
1.1.2 The nature-based education 5
1.1.3 The approaches of environment-based education.....5
1.2 The outdoor education concepts 6
1.2.1 The experience is the main approach to outdoor education 7
1.2.2 The experiential education.....8
1.2.3 The adventure education.....9
1.2.4 The environmental education 10
1.3 The development of the outdoor education 12
1.4 Outdoor education project 15
1.4.1 The nature connections project 15
1.4.1.1 Pupils' developing factors 16
1.4.1.2 Teachers' developing factors.....16
1.4.1.3 Curriculum's developing factors.....17
1.4.1.4 Schools developing factors.....17
1.4.1.5 The nature connections project's findings.....17
1.5 The outcomes.....18
2 Chapter 2: The theoretical framework of children-outdoor environment.....19

2.1 The children-nature environment....20
2.1.1 Children and nature experiences....20
2.2 The theoretical framework view of children-nature relationships22
2.2.1 The visual approach 22
٢.٢.٢ Function approach....22
2.3 The children outdoor environment characteristics....24
2.3.1 The motivational factors....26
2.3.1.1 Environment's scale 26
2.3.1.2 Flexibility of environment....27
2.3.1.3 The aesthetics Quality 29
2.3.2 The usability factors....30
2.3.2.1 The accessibility....30
2.3.2.2 Safety....31
2.3.3 Legibility factors....32
2.3.3.1 Physical elements....32
2.3.3.2 Landscape characteristics 33
2.4 The outcomes....34
3 Chapter 3: The theoretical framework of educational domains and children development....35
3.1 The theoretical framework of education domains 36
3.1.1 The domains of Educations 36
3.1.1.1 The cognitive domain....37
3.1.1.2 The affective domain....43
3.1.1.2 The psychomotor domain 48
3.2 The theoretical framework of the children' personality development dimensions52
3.2.1 The behavioral development dimensions 53
3.2.2 The social development dimensions 55
3.2.2.1 The social activities....56
3.3 The findings and outcomes....57
Analyzing knoWledge 60
4 Chapter 4: The United Kingdom education context 61
The education context of the....62
4.1 United Kingdom....62
4.1.1 The national education structure in England 62
4.1.1.1 The stage 1&2 objectives 62
4.1.1.2 The national curriculum structure of stage 1&2 63
4.1.2 The assessments of students in the United Kingdom....64
4.2 National guidelines of primary schools....65
4.2.1 The site area....65
4.2.1.1 Net Site Area:....68

4.2.1.2 Soft outdoor PE area: 76
4.2.1.3 Hard outdoor PE area 77
4.2.1.4 Soft informal and social areas:....78
4.2.1.5 Hard informal and social areas 80
4.2.1.6 Habitat areas 82
4.3 The outcome 84
5 Chapter 5: South molton community primary schools – The Case Study 86
5.1 South Molton community primary schools 87
5.1.1 Site analysis of the south Molton community primary schools 87
5.2 The outdoor environment characteristics 90
5.2.1 The motivational factors....90
5.2.2 The usability 93
5.2.2.1 Accessibility 93
5.2.2.2 safety 94
5.2.3 The legibility....96
5.3 The education domains performance 99
5.3.1 The cognitive domain....99
5.3.1.1 Educational activities 99
5.3.1.2 The eco-environment....103
5.3.2 The affective domain....106
5.3.3 The psychomotor domain 110
5.4 development dimensions 113
5.4.1 The behavioral dimension 113
5.4.2 The social dimension....113
5.5 The outcome 116
APPLYING KNOWLEDGE 117
6 CHAPTER 6: The Egyption education context 118
6.1 The national curriculum structure of primary stage....119
6.2 The national requirements and guidelines of the Egyptian primary schools 120
٦.٢.١ The Area requirements of the national guidelines 120
6.2.1.1 The net site area 120
6.2.1.2 The outdoor court....121
6.2.1.3 The indoor court....121
6.2.2 The outcomes of analyzing the Egyptian national guidelines 121
6.3 The performance of the Egyptians' school's outdoor environment 123
٦.٣.١ EL-Qatamia primary school 123
6.3.1.1 The outdoor environment characteristics 124
6.3.1.2 The educational domains....127

6.3.1.3 The development dimensions 128
6.4 The outcomes 128
7 chapter 7: Conclusion & Recommendation 129
7.1 Conclusion 130
7.2 Recommendations 131
7.3 Suggestion for further research 134
References 135
Abstract Arabic 150

Table of figures

Figure 1: The overall research methodology map. 10
Figure 2: The United Kingdom and Egyptian case study methodology. 11
Figure 3: The research structure. 12
Figure 1. 1: Core aspects of ecological literacy. 3
Figure 1. 2: the different motives of a natural experience. 4
Figure 1. 3: The approaches and characteristics of environment-based education. 5
Figure 1. 4: The cycle of experiential learning. 9
Figure 1. 5: the impact of the adventure education model on the pupils. 10
Figure 1. 6: The two directions of EE. 11
Figure 1. 7: The dimensions of the EE through the outdoor environment. 12
Figure 1. 8: The education process's aspects. 15
Figure 1. 9: The design principles of the educational outdoor environment. 18
Figure 2. 1: types of children's natural experiences. 20
Figure 2. 2: Types of natural experiences and modes of learning in childhood development. 21
Figure 2. 3: The characteristics of the children's outdoor environment. .25
Figure 2. 4: The natural elements scaled for children's outdoor environment. 26
Figure 2. 5: The non-natural elements scaled for children's outdoor environment. 27
Figure 2. 6: the children's outdoor environment without a sense of enclosure. 27
Figure 2. 7: primary pupils sharing in finishing their outdoor environment. 28
Figure 2. 8: The alternative activities for one space of the outdoor environment. 28
Figure 2. 9: Interacting of children with mud materials. 28
Figure 2. 10: Difference of textures to leading the children within an outdoor environment. 29
Figure 2. 11: creating children's activities by using verities of colors on the outdoor environment. 30
Figure 2. 12: the direct access between the indoor and outdoor of the school building. 31
Figure 2. 13: The different types of built and natural fences. 32
Figure 2. 14: Different uses of the site topography. 33
Figure 2. 15: the access points for the outdoor area. 71
Figure 3. 1: The bloom's domains of education. 36
Figure 3. 3: The timeline of the development of the bloom's domains. .37

Figure 3. 4: the difference between the bloom's cognitive taxonomy and Lorin Anderson's cognitive taxonomy. 38
Figure 3. 5: The four-stage of cognitive development for humans.....39
Figure 3. 6: mathematical landscape patterns.....40
Figure 3. 7: mathematical problem equations through the landscape.....40
Figure 3. 8: scale bars through the landscape. 41
Figure 3. 9: The percentage diagram circle through the landscape. 41
Figure 3. 10: Using the chalk out in the outdoor environment. 42
Figure 3. 11: planting activities for pupils.....42
Figure 3. 12: Using nature elements to produce energy. 42
Figure 3. 13: Recycling activities through the outdoor environment 43
Figure 3.14: dealing with animals through the outdoor environment. 43
Figure 3.15: Dealing with insects through the outdoor environment. 43
Figure 3. 16: Maslow's hierarchy of needs. 44
Figure 3. 17: the bloom's affective taxonomy. 45
Figure 3. 18: Drawing classes through the outdoor environment area. ..46
Figure 3. 19: Sculpture classes through the outdoor environment. 47
Figure 3. 20: children's theater building in the outdoor environment. 47
Figure 3. 21: cooking activities through the schools' outdoor environment. 47
Figure 3. 22: physical challenge activity for the pupils. 48
Figure 3. 23: The difference between bloom, R.H. Dave, E.J. Simpson, and A.J. Harrow psychomotor taxonomy. 49
Figure 3. 24: Football performance in the schools' outdoor area. 50
Figure 3. 25: Basketball performance in the schools' outdoor area.....51
Figure 3. 26: Volleyball performance in the schools' outdoor environment. 51
Figure 3. 27: Running performance in the primary schools' outdoor environment. 51
Figure 3. 28: Karate and Kung Fu performance in the primary schools' outdoor environment 51
Figure 3. 29: The first step in classical conditioning. 54
Figure 3. 30: The second step in classical conditioning. 54
Figure 3. 31: the third step in classical conditioning. 54
Figure 3. 32: The categories of social and emotional competencies for the child's well-being in primary schools. 55
Figure 3. 33: outdoor classrooms in the schools' outdoor environment..57
Figure 3. 34: parents sharing the pupils' activities in the schools' outdoor environment. 57
Figure 3. 35: The design principles of the educational outdoor environment. 58

Figure 4. 1: The positive effect of outdoor education on the pupils. 16
Figure 4. 2: The Aims of stage 1&2 of the curriculum in the United Kingdom. 63
Figure 4. 3: The United Kingdom's place in The Latest global competitiveness reports classification. 64
Figure 4. 4: Categories of area for site area. 66
Figure 4. 5: Gross and net site area for England primary schools. 66
Figure 4. 6: Net site area and non-net site area lime tree primary academy. 67
Figure 4. 7: Categories of space for the net and non-net site area. 67
Figure 4. 8: the management of the use of net site area in priority order.68
Figure 4. 9: Lime Tree primary academy. 70
Figure 4. 10: the pathways between the buildings and outdoor area of lime trees primary. 70
Figure 4. 11: the zoning of the outdoor area of lime tree primary academy. 71
Figure 4. 12: Ivydale Primary School. 73
Figure 4. 13: the zoning area of Ivydale Primary School. 73
Figure 4. 14: the functions of outdoor zones of Ivydale Primary School.74
Figure 4. 15: The Kings Avenue primary school. 74
Figure 4. 16: the zoning of the outdoor area of the Kings Avenue primary school. 75
Figure 4. 17: the functions of outdoor zones of the Kings Avenue primary school. 75
Figure 4. 18: The soft PE area of lime tree primary academy. 76
Figure 4. 19: the soft PE area of Kings Avenue primary school. 77
Figure 4. 20: the hard PE area of lime tree primary academy. 77
Figure 4. 21: the hard PE area of Ivydale Primary School. 78
Figure 4. 22: the soft informal and social area of lime tree primary academy. 79
Figure 4. 23: the soft and informal area of Ivydale Primary School. 79
Figure 4. 24: the activities of soft informal and social of Ivydale Primary School. 80
Figure 4. 25: the hard informal and social area in the lime tree primary academy. 81
Figure 4. 26: The circulation of the hard informal and social area of lime tree primary academy. 81
Figure 4. 27: The shaded area of the informal and social area of the lime tree primary academy. 81
Figure 4. 28: the hard informal and social areas of Ivydale Primary School. 82