



**TOWARDS A METHODOLOGY FOR RAISING THE
EFFICIENCY OF THE FUNCTIONAL PERFORMANCE
OF EARLY CHILDHOOD EDUCATIONAL SPACES
CASE STUDY: KINDERGARTEN CLASSROOMS OF
EGYPTIAN PRIVATE SCHOOLS**

By

Nouran Magdy Mohamed Ibrahim

A Thesis Submitted to the
Faculty of Engineering at Cairo University
in Partial Fulfillment of the
Requirements for the Degree of
DOCTOR OF PHILOSOPHY
in
Architectural Engineering

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
GIZA, EGYPT
2019

**TOWARDS A METHODOLOGY FOR RAISING THE
EFFICIENCY OF THE FUNCTIONAL PERFORMANCE
OF EARLY CHILDHOOD EDUCATIONAL SPACES
CASE STUDY: KINDERGARTEN CLASSROOMS OF
EGYPTIAN PRIVATE SCHOOLS**

By
Nouran Magdy Mohamed Ibrahim

A Thesis Submitted to the
Faculty of Engineering at Cairo University
in Partial Fulfillment of the
Requirements for the Degree of
DOCTOR OF PHILOSOPHY
in
Architectural Engineering

Under the Supervision of

Prof. Dr. MEDHAT EL SHAZLY

Professor of Building Technology
Department of Architecture
Faculty of Engineering, Cairo University

Dr. MOHAMED THABAT

Lecturer of Architecture
Modern Academy for Engineering and
Technology

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
GIZA, EGYPT
2019

**TOWARDS A METHODOLOGY FOR RAISING THE
EFFICIENCY OF THE FUNCTIONAL PERFORMANCE
OF EARLY CHILDHOOD EDUCATIONAL SPACES
CASE STUDY: KINDERGARTEN CLASSROOMS OF
EGYPTIAN PRIVATE SCHOOLS**

By
Nouran Magdy Mohamed Ibrahim

A Thesis Submitted to the
Faculty of Engineering at Cairo University
in Partial Fulfillment of the
Requirements for the Degree of
DOCTOR OF PHILOSOPHY
in
Architectural Engineering

Approved by the
Examining Committee

Prof. Dr. Medhat Mohamed El Shazly, Thesis Main Advisor

Assoc. Prof. Dr. Naila Tolan, Internal Examiner

Prof. Dr. Sherif Mohamed El Attar, External Examiner
- Vice Dean of Faculty of Engineering for Community Service and
Environmental development, Fayoum University

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
GIZA, EGYPT
2019

Engineer: Nouran Magdy Mohamed Ibrahim
Date of Birth: 20 / 10 / 1988
Nationality: Egyptian
E-mail: nouran2008@gmail.com
Phone. : 01022935541
Address: 6060 Fifth district Middle Plateau, Mokattam
Registration Date: 1 / 10 / 2015
Awarding Date: / / 2019
Degree: Doctor of Philosophy
Department: Architecture Engineering



Supervisors: Prof. Dr. Medhat Mohamed El Shazly
Dr. Mohamed Thabat Ismail

Lecturer of Architecture - Modern Academy for Engineering and Technology

Examiners: Prof. Dr. Medhat Mohamed El Shazly (Thesis Main Advisor)
Assoc.Prof. Dr. Naela Tolan (Internal Examiner)
Prof. Dr. Sherif Mohamed El Attar (External Examiner)
Vice dean of Community Service and Environmental development, Faculty of
Engineering, Fayoum University

Title of Thesis: Towards a methodology for raising the efficiency of the functional performance of early childhood educational spaces. Case study: Kindergarten classrooms of Egyptian private schools.

Key Words: Kindergarten Architecture; Childhood development; Kindergarten's classroom; Developmental interior designable themes; quality of infancy

Summary:

The early childhood objectives may be easily achieved through a massive cooperation of Architecture, children psychology, and the early years' recent pedagogies. Global education has been increasingly focusing on early childhood development and education over the last decade. Various changes had been witnessed in the aspects of architecture, pedagogy, and technological development. This thesis had analyzed the most important themes which were globally achieved in early childhood pedagogies and their relation with the interior space of the kindergarten classroom. Also, it had analyzed the developmental factors of early childhood psychology that must be taken in concern for children during their attendance in the classroom. Furthermore, it evaluated the relation between the interior design of the kindergarten classroom space to both (early childhood pedagogies and children psychology).

Disclaimer

I hereby declare that this thesis is my own original work and that no part of it has been submitted for a degree qualification at any other university or institute.

I further declare that I have appropriately acknowledged all sources used and have cited them in the references section.

Name: Nouran Magdy Mohamed Ibrahim

Date:

Signature:

Acknowledgments

First I thank God, the glorious and compassionate, for helping me and giving me the strength to accomplish this work.

My appreciation and gratitude goes then to Prof. Dr. Medhat El Shazly for his constant support and intellectual advice. I also thank Dr. Mohamed Thabat for his continuous encouragement, guidance and support.

Finally, I would like to express my deepest thanks and gratitude to my parents, my sister and especially to my colleague and husband Arch. Moutaz el Baz, for their endless patience, support and care.

Table of Contents

ACKNOWLEDGMENTS.....	III
TABLE OF CONTENTS	V
LIST OF TABLES	IX
LIST OF FIGURES	XIII
ABSTRACT	XIX
INTRODUCTION	XX
1. CHAPTER ONE - EARLY CHILDHOOD EDUCATIONAL PEDAGOGIES IN RELATION WITH THE INTERIOR DESIGN OF THE KINDREGARTEN CLASSROOM	1
1.1. Introduction	2
1.2. Concepts of Early childhood education (A Pilot Overview)	2
1.3. Quality as a primary fundamental in ECE (Early childhood education)	3
1.4. Prevalent status of Early learning Standards (the matter of context and content)	4
1.4.1. The Latest Trends of Early Learning	5
1.5. Pedagogical Play as a New Aspect in Early childhood Education	6
1.5.1. Three Enterprising Approaches in Play-based Early Learning Process.....	6
1.6. Linking Pedagogy with Architecture	11
1.7. Pre-school's Global Designing Fundamentals	13
1.7.1. Guiding lines for Designing of Activity Places	17
1.7.2. Display CUM Storage	17
1.8. The Current Status of the Designing Parameters of KG classroom space.....	18
1.8.1. The Classroom zones	18
1.8.2. Properties of the Kindergarten Classroom	23
1.8.2.1. The Technologies applied inside the classroom	23
1.8.2.2. The Interior Finishes of the Classroom	25
1.8.2.3. The Acoustics of the Classroom	30
1.8.2.4. The Thermal Comfort and Air Quality Perceptions of the Classroom	31
1.9 The Egyptian designing fundamentals according to the Egyptian Institute of Educational buildings	32
1.10 Conclusion	33

2. CHAPTER TWO - THE PSYCHOLOGY OF EARLY CHILDHOOD	34
2.1. Introduction	35
2.2. Concepts of Early Childhood Age	35
2.2.1. Early Childhood Age and Capital Investment	35
2.2.2. Kindergarteners as New Citizens	36
2.3. Children Developmental Outcomes and Socio-emotional gains	37
2.4. Enhancing Positive Development in Early Childhood	37
2.4.1. The Early Childhood Developmental Internal Assets	38
2.4.1.1. The Internal Assets Categories and Sub-categories	39
2.5. The Presence of Early Childhood Developmental Internal Assets inside the Kindergarten classroom – Survey 1	41
2.5.1 Participants	41
2.5.2 Procedures	42
2.5.3 Results	42
2.6. Conclusion	52
 3. CHAPTER THREE - THE PSYCHOLOGY OF EARLY CHILDHOOD IN RELATION TO THE INTERIOR DESIGN OF THE KINDERGARTEN CLASSROOM SPACE	 53
3.1 Introduction	54
3.2 The Psychological Stability of the child in relation to the space	54
3.3 Kindergartners Preferences on their School Environment.....	54
3.4 Children’s Age Needs in relation to the Learning Space Design	55
3.5 Emotional and Cognitive Effects of the Learning Environment on Children Development	56
3.6 Architectural Aesthetic Factors for Better Early Childhood Psychological Development	57
3.6.1 Floors	57
3.6.2 Walls	57
3.6.3 Ceiling	58
3.6.4 Color	58
3.6.5. Light	59
3.6.6 Texture	60
3.7 The KG Classroom Space Effectiveness on the Psychological Development of Children	60
3.8 The KG Classroom Technological Supplements Impact on Children Psychological Development	62
3.9 Conclusion	68
 4. CHAPTER FOUR –A METHODOLOGY FOR DESIGNING THE KINDERGARTEN CLASSROOM.....	 69
4.1 Research Strategy	70

4.2 Research Methodology	70
4.3 Cases Study Analysis	72
4.3.1 International Cases Study	72
4.3.1.1 The Roger's public school in Philadelphia, USA	72
4.3.1.2 The Senora Hahn's school in Spain	73
4.3.1.3 Peaceful Pathways Montessori Academy, Manhattan	73
4.3.1.4 The British School of Sophia, Bulgaria	74
4.3.1.5 The Learning Express School in Plymouth, Michigan	75
4.3.2 Egyptian Cases Study	75
4.3.2.1 Stars language school, Cairo, Egypt	75
4.3.2.2 Green Valley language school, Cairo, Egypt	76
4.3.2.3 Sama language school, Cairo, Egypt	77
4.3.2.4 Al Rowad Language school, Cairo, Egypt	77
4.3.2.5 Future Language school, Cairo, Egypt	78
4.4 Results of Theorem Proof and Cases study Analysis	79
4.4.1 The Interior design parameters of the KG classroom that enhance the Psychological Development of Children	79
4.5 The Effectiveness of the interior design parameters corresponding to each developmental factor of early childhood Psychology – Survey 2	83
4.5.1 Participants	83
4.5.2 Procedures	84
4.5.3 Results	84
4.6 A Concluded Proposed Methodology for Architects which is scientifically enhancing the psychological development of children	115
4.7 Conclusion	122

5. CHAPTER FIVE – THE APPLYING STUDY123

5.1 Introduction	124
5.2 Designing Proto-type model for the kindergarten classroom space	124
5.2.1 Designing a Proto-type for Nursery Room	124
5.2.1.1 Specifications for Nursery room proto-type model	126
5.2.2 Designing a Proto-type for Kindergarten classroom - Level One	128
5.2.2.1 Specifications for KG1 classroom proto-type	131
5.2.3 Designing a Proto-type for Kindergarten classroom - Level Two	132
5.2.3.1 Specifications for KG2 classroom proto-type	135
5.2.4 Floor Finishes	136
5.2.5 Walls' Finishes	137
5.2.6 Windows	138
5.2.7 Doors	138
5.2.8 Fabrics	138
5.3 Advantages of the Proto-type model	139

CONCLUSIONS

FINAL CONCLUSION SUMMARY

REFERENCES.....	
RECOMMENDATIONS	
APPENDIX	