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The Study of Environmental Factors Effects on Kindergartens Architecture

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Abstract

Nowadays with the growth of urbanism, the vitality of the compatibility of public places and social needs has grown more important. Over recent years children have spent most of their free time doing activities with no physical effort involved. As a result, the idea of creating places designed to prevent this lack of physical activity is put forward.Unfortunately, it is usually observed that places specially built for children have been designed without taking the actual needs of children into account.

The research method of this article is analytical-imputative and descriptive which, by referring to sources of and essentials of environmental psychology and growth and analyzing them, has made an effort to compile design basics in accordance with children's needs.

Considering the fact that children's building is a content-analysis place in which a child's most important childhood activity, playing games, takes place, children's building can be interpreted as a playing games building. This interpretation brings forth the idea of "experience building". According to Maslow it is possible to label childhood development as "self-development". This study can offer solutions for creating creative environments for children.

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Introduction

One of the most important characteristics of human being and the center of their lives is the power of thought. During their lives human beings have never stopped thinking and doing so has enabled them to tackle and solve different issues and problems leading to development and elevation of mankind. This is why all human success and achievements owe themselves to such effective and dynamic thought. Creative thinking is one of the most important aspects of humankind about which there are many different theories and viewpoint. None of which has been a point of agreement among researchers and psychologists. Creativity is without doubt under the influence of the surroundings. A collection of definitions divides creativity as following: Some put personal characteristics as basis, and others have considered creativity through creative process. Guilford is among those who consider creativity through personality. He believes that creativity is a combination of abilities and attributes that lead to creative thinking [1].

Gislin believes: Creativity is a new presentation of concepts and meanings and Taylor defines creativity as what shapes experiences in new categories. Creativity is an ability whose development and blossom are dependent on personal, social and environmental factors such as family, personal characteristics and overcoming personal and social obstacles such as fear of losing or creating creative,

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educational spaces and so on. The discovery of talents and creative behavior in people has always been among mankind's ambitions which has to be noticed since early childhood.

Without doubt the most fascinating thing in the world is watching a child's artistic effort from the design until finalizing, from the beginning until the end, of a work and this effort needs to be developed under certain circumstances and specific environment in order for child's creativity to develop [2].

Environmental psychology of children

Environmental psychology of children is a field of study that deals with the interactions between people and their environment [3]. In other words, it is a rather new filed in psychology that studies the mutual effect of children's behavior and the environment. The simplest definition may be Graman's. He believes that environmental psychology completes general psychology lacking environment.

Traditionally in children environmental psychology the emphasis has been on how behavior, emotions and well-being of children and human beings are under the influence of the physical environment and that the most important phase in one's life is a person's childhood. A period in which the basis of one's personality is formed. In addition to physical development, a child experiences social, emotional, personal and intellectual development as well. These factors are all essential factors in human development and growth which form among children all over the world since their childhood. In addition to growth, a series of physical, social and personal changes happen over time.

A child's development is the scientific study of these changes in childhood. All people experience this growing up process whose many aspects are predictable. Children learn to sit before they walk, and walking before running. This predictability is what enables the scientific study of development and growth [4].

Historical viewpoints on Growth Psychology

In the early 20th century one of the research goals in growth psychology was the collection of descriptive information on growth customs. For instance, some information was published based on many careful observations on children's language. The information reflected the number of words a one-year-old child can produce on average, the average age in which children use two-word phrases and many others are examples of such demographics. Using these observations, changes in age which is clear from children's game and mutual interactions between each other is explained. Intelligence quotient tests were designed base on the average intellectual performance of each age group. The purpose of such descriptive research was providing behavioral norms [5].

Three movements in European and American psychology took place which later on had a great impact on growth psychology. First was Freud's psycho-analysis theory. Second was Jon Watson who started the Behaviorism movement. Not only was he an extreme environmentalist, he was also a direct and all out author. He claims: Give me a few healthy babies and let me bring them up in my unique world. I guarantee that I will create whatever specialist I want out of them regardless of their talent, abilities and tendencies and profession and race. A doctor, a lawyer, a businessman or even a thief or a beggar. Thirdly it was Piaget who started conducting his own studies on children's intellectual growth in Swiss.

These three movements gradually formed the new basis of child psychology. In the early 60's Piaget's growth and development theory found its way into the U.S and his viewpoints affected fundamental views on children. Piaget's focus was on collectivity in child's development rather than personal differences, and believed that growth is a result of mutual interactions rooting from growth and experience. With careful observation of his three children he was convinced that children are active

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beings who are after motivation and form and organize their own experiences without the environment giving them any direct education or program [5].

Child acknowledgement from psychological view

Correct and thorough acknowledgement of children is the most fundamental factor in upbringing and educating children. In every growth period mankind has their unique needs. This means that based on intellectual and emotional development mankind recognizes his/her surroundings in a unique way. This is the reason that by aging and gaining experience and education, everybody looks back at their past understandings and perceptions in a critical manner and at times call their personal beliefs and perceptions critical. Therefore, in every age gap different motives, beings and specification, according to child's understanding, should be taught. The important goal that kindergartens are after accordingly is that educational, social and natural topics which are selected for children's intellectual and physical growth must firstly be simple and secondly noticeable and able to be experienced and thirdly contain scientifically correct information and interaction patterns. As a result, kindergartens are not expected to teach a wide body of knowledge to children, but what is taught is expected to be logically and scientifically correct.

Children's attributes especially mental, intellectual, emotional and their limitations in life experiences indicates a lack of mental capability and growth in the level of an adult in children and on the other hand emphasizes on extreme emotional attributes and the impressionability of this age group. The overcoming of emotions over logic usually leads to the result that pre-school children are attracted to educational programs easier through playing games and artistic abilities and their upbringing is more successfully achieved. In addition, during such activities children benefit from discretion and fun and the variety needed and such activities are more attractive to them. The existence of characteristics such as imagination and fiction and significant emotional characteristics in childhood indicate an even more symmetrical relation between artistic language and language as well as nature tendencies of this age group. Some of these characteristics include: Curiosity, imagination, fiction, playing games, painting, poetry, story reading and sport [6].

Growth stages in childhood

Human being experiences growth in all stages of life. Growth rate however, is different during various ages. This means that this growth is fast and rapid, contrary to a slow and steady pace during other stages. A person's childhood is the most important stage in which this growth is easily noticeable. [7]

- Child's physical growth

Physical growth rate is fast from birth until the ages of 5 and 6 and then it becomes rather slow and steady until the age of 10. Between 11 to 13 years of age this growth rate increases and with a quite fast pace coincides with puberty and therefore children's environment and toys must be designed with regard to their bodies. A child's height growth at the age of 5 is twice as much as when the child was an infant and his / her weight growth 5 times in comparison with infancy. Afterwards, from 5 to 10 years of age, weight and height growth decelerate in children, but their ambulance, agility, strength, skills and the ability to learn is extremely high during this period. [8]

- Child's mental growth

Taking different aspects of growth into account, mental and psychological growth is the most important factor. Therefore, in order to improve mental growth of a child and because of the importance of the issue we would like to look into the matter in details. First we analyze child's frame of mind and then different stages of child's psychological development from Piaget's point of view. Our better understanding of the unique characteristics of each of these stages enables the spaces and tasks we assign to children to be of greater help in their path toward development. [8]

1. Child's frame of mind

Nowadays all experimental psychologists agree that different behaviors of a child during different periods and child's upbringing, instinctive or obtained, completely depend on the lineal changes and the development of child's brain system. [8]

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Child's brain weight doubles in the first year of his life. The reason of this weight gain is partly because of an increase in the number of brain cells and partly to the development of connections between brain cells and different brain parts. [8]

Without such connections we are unable to think and learning starts due to these connections. When a baby takes an interest in something and makes a mental effort, these connections form a network. A child does so when each of his senses is aroused.

Therefore, from birth, variety of sounds and images, connections, emotions, smells and tastes create more connections. This process is important because of the major growth jumps brain has during 1 to 3 years of age.

It is possible to help brain development by creating drives in the environment. The more and the richer these drives which are sent through the environment are, the more a child's reactions to the environment and hence a wider body of thoughts. This is how we understand the importance of the living surroundings in childhood. [8]

2. Stages of child's mental development

From Piaget's point of view child's mental development starts from the moment of birth and continues until the ages of 14 and 15. At around the age of 14 or 15, a person's mental growth is complete and no more structures will be build. This proves the importance of childhood and teen-hood.

Piaget's studies show that the understanding and logic process of a child directly stems from what happens in the surrounding of a child and by altering these changes it is possible to accelerate or decelerate the progress of this process.

He has analyzed behavioral characteristics of children in connection with environmental adaptation through adaptation process and believes that the development of every human being is a process with its unique factors and characteristics. [9]

3. Intellectual growth of a child

Piaget has defined four stages that end up in the adult manner of thinking. Each stage is necessary for the on after. Hence, the pace which children go through these stages is different and depends on in-built talents and environmental situations. These four stages include: [10]

A. Touching-moving stage (0-2 years of age)

Piaget has called this stage touching-moving because of the fact that a baby starts learning by touching and through searching and fiddling with his environment he gains control over his movements. From the start biology and experience join together and create taught behavior. One of the most important achievements of this stage is the appearance of object permanence. This term is referred to child's ability to understand an object's existence independent from his. [10]

B. Pre-performance stage (direct perception, 2-7 years of age)

Because the child is unable to act, which is a complicated mental process, this stage has been called pre-performance stage. In this stage a child uses signs and language more than the touching-moving stage. Reasoning and thinking are at direct perception level because the child learns without reasoning. In order to simplify the definition of this stage, it is broken down into two subcategories.

B.1) Pre-understanding sub-stage (from 2 to 4 years of age)

This sub-stage is called pre-understanding because even though the child uses concepts in this sub-stage, these concepts are incomplete and often make no sense to adults.

B.2) Observational thought sub-stage (from 4 to 7 years of age).

After 4 years of age, child's thought grow significantly more logical despite the fact that the perception still dominates child's thoughts more than his logic. This sub-stage is called observational because the observational understanding, under the influence of perception and self-centeredness of a child, plays an important role in the way a child thinks. [10]

C. Objective performance stage (7 to 11 years of age)

The most significant characteristic of this stage is that the child's activities are in relation with his living surroundings. As a result, his direct interaction with his surroundings is one of his most important games and the child is eagerly after playing such games. At this stage a child has a wider view of his surroundings and tries to discover his surroundings through playing games. Achieving the meaning of survival is the most important factor to judge if a child has reached this stage. [10]

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D. Nominal performance stage (teen-hood period from 11 to 19 years of age)

Most contemporary psychologists believe that any distinction and division of growth and evolution period, including teen-hood, is something relevant and that setting a definite starting and finishing point of teen-hood is difficult. This is because growth and development process is continuous and gradual and there's no boarder between the stages of growth and evolution and any division of growth and development process is conventional and depends on researcher's view of teen-hood. Another hardship in dividing growth into different stages is due to personal differences among humans which are caused by environmental and lineal factors. The length of teen-hood changes based on the differences in culture, financial and social status of the personal environment. Based on the points mentioned, it is rather impossible to define a specific period for teen-hood. To simplify things, we need to accept that teen-hood usually starts at 11 to 12 and ends in 18 to 19 years of age. [10]

The importance of creativity in children

The world we live in is rapidly changing. This rapid rate of change, which has never been as fast as it now is, reminds us the importance of creativity when facing these changes. We don't know what problems our children will face, but we do know that they will need creativity and fiction to deal with these problems. Today's children need to: turn into adults who can cope with unexpected happenings, expand their knowledge to new situations, relate the seemingly unrelated previous information, use information someway new, examine new concepts, adapt with constant changes, reexamine values and viewpoints, control and correct their world, have flexible thinking, play with concepts and materials, work with people of different languages and religions, sympathize with others, cooperate with different people in different ways, take risks, be creative and respond to challenges with great imagination. [11] All these, and other similar points, in our children's life are dependent on their upbringing in their childhood and sadly we have often viewed creative and imagined thoughts which promote such characteristics worthless. Psychological needs form the basis of physical and mental health and hygiene. Needs and motives can affect all the different aspects of the behavior of a person and influence their perceptions, imaginations, learning and reasoning. [12] Correct education and upbringing requires understanding and paying enough attention to needs and comprehensive motives and development and the blossoming of talents and emotional, logical, moral and divine training have a deep connection with the way physical and psychological needs are recognized and answered. [13]

Upbringing equipment from psychological point of view

The environment presents children with extremely varied and different equipment and opportunities among which the effect of natural, social, somatic and functional elements on the creativity and the upbringing of a child is of the most important of these opportunities and equipment.

The somatic effect of environment on child's creativity and upbringing

Studies show that paying attention to environmental factors can lead to better learning [3]. Piaget believes that educational environments must be designed to that they make children and students and classroom active. In simple words, an active classroom or school is a classroom or a school in which great attention is paid to operational learning, learning that deals with forms and procedures and learning that is based on implied reasoning. This can be achieved through provision of equipment and supplies, grouping, teacher's role, activity rates in classroom, orderliness and upbringing in classroom and discipline [14]. In many conducted researchers by environmental psychologists, the effect of the change in different classroom elements has been practiced.

Robert Guilford has mentioned some of these examples in the environmental psychology book; in a research done in 1981 in over 1000 schools over a period of 3 year, changing the furniture of classroom changed the amount of creativity and classroom skills of the children. Another research revealed that the existence of carpets in classroom leads to spending more time in classroom and more direct communication [15]. If classroom chairs, tables, carpets, pillows and environment changes according to each activity, we will surely see an increase in the efficiency of these behavioral bases [14].

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It needs to be considered that in classroom design the topic of the lesson and the curriculum must be taken into account so that they fit different activities. Some lessons need a quiet environment and some are freer. Nonetheless they must possess certain characteristics. If a classroom fails to provide a quiet environment for studying or lack sufficient air conditioning, it slows down learning process. Nowadays classrooms need to create a situation so that teachers listen to children's needs and requests and that children create friendlier connections with their teachers and classmates [15].
Classrooms must be organized so that they have enough space for both big and small group projects. There must also be a space to exhibit what students have made as well as images and pictures. Classrooms of an educational and cultural center can be specifically designed to fit different activities. Fundamental elements of physical environments are defined by changing elements such as lighting, color and so on. Color and lighting play a very important part in learning. Proper use of these elements can increase learning rate by up to 35 percent. It also reduces children's stress and impatience [16].

The effect of functional elements on the upbringing and growth of child

Playing games, as the most important functional element in the growth and upbringing of child, has been explained below. Child's instinctive tendency to exhibit his inner aspects and know the world around him is called playing games. Games are a tool for inner understanding of child. Playing games is the most important activity of a child which keeps him busy in addition to other important roles it has. Each of these roles relate to an aspect in child's life that prepare him to enter the world of adulthood. Child's character is formed when playing games and significant changes occur in his personality. Creativity and innovation of children occur in creating of the topic of the game and the tools used to realize the game. A child rediscovers and reinvents himself according to any change in his world through playing games. It is the most dominant and important activity a child can do in order to develop and exhibit his personal and social skills. It is therefore impossible to separate a child's world from games and even the problems they experience manifest themselves in the games they play. Children's games are an example of chain learning process through which behaviors they have learned through drive-response combine and create complex behaviors [17]. Playing games start with the birth of a baby. Children perform subconscious moves in order to adapt their surrounding from an early age. These move have no meaning at the start. Child's adaptation with his surroundings and his all-round growth will turn these subconscious moves to imitating people's voice and movements, especially their mothers. Playing games is the main part of a child before school and is a valuable aspect of growth, social and emotional understanding of a child. The basis of an adults' personality is rooted in his childhood games [18].

The importance of games

Game refers to a wide range of different activities and therefore is not a great choice of term. Games are an occupation and job for children whereas adults use games to fill their spare time. A child never wastes his time while playing games and what to adults seem like important activities, like changing clothes, eating or helping with house chores, are never more important that children's games. Playing games is the best way of spending time for a child and it is one of the most fundamental and constructive growth stages in children [19]. These games include: physical games, imitation games, imaginary games, educational games, exhibition games and entertainment games [20].
Games in Froebel's view: There have been a number of definitions for games. In Froebel's view games are a tool to help natural talents and interests of a child to blossom. John Davy acknowledges game as an activity that is not conscious or don't to reach a certain conclusion and this is why makes games and work different [9]. There are two different theories for game:

A. Classic theories, which include:

A.1. Excessive energy consumption theory: Schiller believes that when physical and mental energy saturates and is not spent on daily activities, the energy is spent in children through playing games. According to this theory, games balance out the energy in children.
A.2. Stress relieve theory: When body energy reaches its minimum and the body needs to gain energy it turns to games in order to minimize its energy loss and deal with the state of impatience and stress.

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A.3. Pre practice theory: According to this theory child learn the activities which they must perform when they're adults through games. These psychologists believe that when a child shows hospitality, he is preparing for adulthood customs of getting together.

B. Active and dynamic theories:

In these theories games are not viewed as they were in classic theories. It is the meaning and the content of games and their analysis that is the basis of these theories. In this category Freud and Piaget's theories are mentioned.

B.1. Piaget's theory: In his idea game is a way of knowing the unknown world by the child. He believes that children's games and their content are in accordance with their environmental and family status. Based on this theory games are vital to the development of child's intelligence and up to an extent they are ever present in human behavior.

B.2. Freud's theory: Freud views game as a relaxing and relieving activity through which a child gets rid of difficult situations and being criticized in life. Freud believes that it is by playing games that a child is prepared to deal with life problems and it is what enables him to show more resilience when facing problems in the future [9].

Effects of natural elements on the upbringing and creativity of a child

Human being is inherently after communicating with nature. Psychologists refer to this as "biophilia". But children these days have lost the chance to explore safe natural environments and natural risks give them a sense of fear and despise which is called "biophilia". Studies show that during early years of life, creativity and thinking powers are improved by experiencing the nature. This thinking power is a strong motive for learning throughout the entire lifetime [21]. Nature manifests itself in many different forms and this infinite variety it offers to child which put all his senses to work, strengthens his creativity. Children who play in natural environments have a better sense of coordination, can keep their balance easier, are more agile and become sick less. When playing in the nature, children's games are more varied and their imagination and creativity grow, as a result of that their language and communication growth become faster. Being present in natural places helps with their cognitive growth and helps their observation and reasoning skills develop. Nature reduces life pressures on children and helps them deal with hardships with less difficulty. Nature helps children improve their observational and creativity skills and gives them a sense of unity and peace with the world. Children who are raised in the nature have more positive feelings towards one another. Natural scenery encourages social interaction between children. Dependence and love towards nature as well as a positive attitude towards living environment stems from an organized relation and playing games in natural environments from early years of childhood. Children which do not have an appropriate relation with the nature show interest in nature and its perseverance [22]. Using natural lighting and plantation to connect with natural environment, attention to the elderly and children as fragile stratums, assigning playing spaces, grass and collaborative and green spaces are of the favorite solutions in lasting buildings [23].

Environment abilities can be categorized in four different categories: Environmental abilities that have physiological and physical aspect and another part which stems from the abilities that are influenced by cultural and social factors. For example climbing trees is fun and understandable for children, but adults can prevent children from doing so because of the possible dangers of doing so or encourage the child to do so to improve his bravery. This makes child's interaction with the environment absolutely important, so much that this interaction includes the formation of personality and physical and mental growth of a child.

So, creating safe and comfortable, accessible, responsive, attractive, creative and intriguing environments in order to develop children's mental and physical growth when creating spaces for children, is of the conclusion reached through researches based on psychological facts and should be considered by psychological designers for children. A child will experience a sense of belonging, local sociability and efficiency by taking part in environmental participation. Doing so enables the child not to view himself as a mere consumer of the environment and in other words the environment becomes meaningful for the child and is seriously considered and analyzed [24].

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The effects of social elements of the environment on the child's growth and development

About the mutual interaction of person with the environment and the role of environmental elements in children's mental and physical development, it is worth mentioning that the core of all growth theories is mutual effect or interaction. All psychologists agree that psychological occurrences and changes are because of the interaction between mankind and the environment, although they disagree what elements are the center of attention here [24]. Coevals and playmates interfere with the forming of personality, social behavior, value order and views. Children learn many social skills through mutual interaction. They learn to give and receive, take part in team activities, enjoy watching others in action, understand others' feelings, evaluate their own abilities, gain self-confidence and gradually grow independent from family and become compatible with the society. Attachment is also important in child's social growth. In ethics theory it is stated that human baby is genetically ready to become attached to those who take care of him and this attachment is important in terms of evolution, because this helps babies adapt themselves with the environment. According to this theory, attachment is an extremely important factor in the social and emotional well-being of child. Hence the child because of the attachment to his parents, accepts their norms and values. This is why creating motivation, improving cognitive skills and having group activities with other children of the same age are of the important social factors affecting a child. Environmental interaction during infancy, childhood and teen-hood are vital to the growth and blossoming of physical, cognitive and creative skills of people and person's environment during this time plays an absolute role in forming existential shape and spiritual and physical growth. Cognitive and intellectual growth of human being is not accidental, but occurs in accordance and at the same time with the growth of other aspects in human being and an improvement in the environment of a child provides him with the possibility of mental and intellectual growth. Spaces' ability to express understandings and unique behavior of children is partly due to the perceptional and behavioral needs of children and their inner exploration motives, and partly due to the latent abilities of these spaces.

Abraham Maslow believes that the forming of an indifferent personality which has no sensitivity or curiosity towards its surrounding environment, or is not interacting with life and has no will to live is the result of failure in satisfying self-built and eager childhood curiosities. Gordon Allport after stating the continuity of evolution processes emphasizes that ideal environmental and experimental childhood conditions are vital in the upbringing of a healthy person. A psychologist named Grinnow states that different shapes and sizes of spaces can be the cause of gatherings and create groups for social interactions. Hence, the design of spaces (the shape, size and purpose) in a way that improves communication and enhances this effect will positively improve creativity [23]. Places in whose somatic design nature has been of help, create the possibility of exploration and search, games and experiences and as a result a much more efficient cognitive growth in children. It is in these places that team and dynamic games are enabled and children take part in group activities and as a result are encouraged to develop their social abilities and skills. Open spaces or natural and remote environments activate children's observational sense [24]. Conclusion

The summary of previously mentioned points and relative solutions has been gathered in form of commentary planning. For this reason the characteristics of spaces responsive to child's needs and their relevant commentary planning have been mentioned in table 1 to table 4.

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Table 1. Somatic elements affecting child's creativity and growth and influential basis and solutions.

Source: the author

Influential basis	Solution
Attention to comprehensible matters by the child	-Using elements which give a sense of continuity in the design of paths -differentiating textures using color and material in crossing -not using elements that are repetitive or carry little differences
Paying attention to new events is a child's characteristic	-creating volumes and shapes so that they strengthen child's power of mind -using different shapes and colors and depth and contrast -attention to grouping considering comprehensible attributes in children, for example color. -Not using abstract meanings in the design of spaces, views and furniture.
The possibility of exploration and experiment will provoke curiosity and the sense of wonder, motivation and creates imagination.	-Creating mysterious and adventurous spaces -enabling moving between activity spaces -Connecting different activities -providing the possibility of experiencing different material -using backspaces and corridors
Getting to know cultural factors is of great importance	designing places with the ability to exhibit works, elements and pictures of different cultural customs -Creating spaces for theatre or local games -the ability to experience the customs, traditions, costumes and food of different ethnic groups
Comfort, safety and suitable physical conditions to enhance and help mental and physical growth	-reducing noise pollution -separating noisy and quiet spaces -using noise insulation -not designing spaces of crowdedness -defining physical territories and their purpose -keeping spaces and furniture appropriately proportional to children's body size -following standards and safety precautions -using appropriate material and furniture -using natural and artificial lighting -not using dark spaces -considering appropriate welfare -considering places for rest and sleeping -considering light, temperature and moisture levels
Flexibility is important in spaces	-changeability of the environment and its elements -consistency of the interior and the exterior considering the view through the windows -connecting bridges from inside to the outside of the building -combining and consistency of inside and outside building by using rolling doors for example -designing outdoor spaces inside, winter gardens or greenhouses for example -The ability to change the environment for children's games -setting a space that is compatible and moveable, by using moveable walls for example

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	-light modular furniture that can be carried and moved by children -designing a space with the ability to exhibit children's work
A sense of personalization and attachment will create desirability	-creating lone and cozy spaces for children's alone time -creating the ability for children to personalize objects and spaces, closets for example -differentiating personal spaces using different colors -using material a child can connect with (natural material
Respecting scaling positively affects the space	-differentiating recognizable areas for children using different activities -considering bigger environments to encourage children to move about and run -considering smaller spaces to encourage concentration -careful attention to the size of doors and separating walls -attention to the size of bathrooms and washrooms
Color creates a sense of desirability in child	-using colors without distinct borders for younger children -using colors with distinct border for older children -using ward colors for places suited for moving about -using cold colors for places of peace and silence -using animal pictures and shapes with abstract colors

Table 2. Functional elements affecting child's creativity and growth and influential basis and solutions. Source: the author

Influential basis	**Solution**
Child's game leads to imagination and increases his touching-moving skills	designing spaces enabling the child to play with different toys -considering places like shelves to store toys -considering large spaces for children to run -designing cycling routes -designing spaces for children to play with water and sand -jumping over surfaces with lots of bumps and those that will create noise -using unbreakable mirrors in different sizes and shapes -using pneumatic game to bring joy and fun -using sponge block for children to build structures their own size -using voice making instruments to encourage children to play instruments -using tread-wheel to help children run infinitely
Existence of high places is good for children. They always look down on the views and can climb up to get different and interesting views of sights around them	-designing tree houses -the possibility to view the surrounding from higher floors -the possibility to go up towers and bridges -tunnels for children to crawl in

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	-wide walls children can walk on -possibility to walk on ropes or hang from them -using huge tunnel slides

Table 3. Natural elements affecting child's creativity and growth and influential basis and solutions. Source: the author

Influential basis	Solution
Interacting with nature and live creatures will activate child's observational senses and curiosity because of the variation and changeability of natural elements	-using natural elements in different ways -creating fountains, waterfalls and aquariums -using different plantation to introduce variety to texture and color -the possibility of changing and differing natural elements -multi-purpose places for children with mountaineering equipment (rope ladders, ropes) -possibility of using labs to explore natural elements -possibility of playing in pools and with sand -using rocks and tree logs in different shapes and sizes in the playing environment
Keeping animals and plants will increase children's sense of responsibility	-creating spaces so children can take care of harmless animals personally (while taking full responsibility) -places to plant and grow plants(with children taking full responsibility) -grass-covered hills for children to roll -creating collections using recyclable material to respect the environment -using a bird garden to familiarize children with their environment -using appropriate plants with different colors and smells in the reach of children

Table 4. Social elements affecting child's creativity and growth and influential basis and solutions. Source: the author

Influential basis	Solution
Cooperation in activities helps with social development of child	-designing group spaces and gaming spaces to facilitate communication -connecting different spaces for children to meet each other -the possibility to experience life skills in groups (for example cooking, piping, carpentry, tailoring and so on) -creating spaces for reading books, poetry, playing music and narrating stories in groups -possibility of putting children of different age groups together so they can discuss and solve their problems themselves
Team games teaches children team work and responsibility	-A space that can turn into another (spaceships, kitchens, bird nests) -designing spaces to learn cultural and folk games -designing gathering halls -possibility to paint in groups on different surfaces

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