STRATEGIES FOR DESIGNING CHILDREN'S EDUCATIONAL ENVIRONMENT IN TABRIZ, CONSIDERING THE CHILD PSYCHOLOGY APPROACH WITH THE EMPHASIS ON EFFECTIVE FACTORS:ENVIRONMENTAL CONDITION, COLOUR AND LIGHT

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A R T I C L E   I N F O

A B S T R A C T

Architecture is the collection of knowledge, technique and art which is trying to achieve the perfect function for environments parallel with the sense of beauty, using associated elements such as shape, colour, texture, etc. Architecture's aim is to improve the physical and mental performance of the environment in order to make the life in it easy. Since many of the activities take place in educational environments, so it is necessary to pay special attention to the environments and their functional features. In designing many types of educational environments, spiritual and psychological aspects of students are paid less attention. The growing need of our country for expanding educational facilities along with the increase in the population and the inadequacy of existing spaces is one of the fundamental problems that should be dealt with. Children are valuable and productive assets for the future of society. Paying attention to children's issues and problems causes progress and development in society while neglecting to resolve their problems makes irreparable damages. Unfortunately, most of educational environments for children in Iran and particularly in Tabriz do not have required compatibility with the psychological characteristics of children. So the recognition and paying attention to the psychological aspects of children can have a significant impact on a child's growth. An issue related to child psychology is quite broad. Therefore in this paper we are satisfied to study the most important aspects such as environmental conditions and the effects of colour and light and provide solutions for improving the performance of these spaces.

INTRODUCTION

With a glimpse into today's life of human race and culture of urban development's and creating metropolis, supplying needs consistent with such a development process is a part of priorities of officials and politicians in metropolitan areas. For this purpose architects and urban planners are trying to create a work with taking the view of urban development and protecting the welfare of the people, in which the dynamics of city and avoiding creating urban nodes and also reduction in the level of traffic jam is tangible in the form of a metropolis's comprehensive plan.

Meanwhile paying attention to future generation of these cities which include the youth of future and also eliminating their needs is of high importance. Considering the beginning of a business day in cities; supply of daily needs take a lot of family's time and money. For example, parents who want to send their children to kindergarten or school for intellectual growth of their children or in order to fill their leisure time want to send them to entertainment centers. The outcomes of such cases are more troublesome than it appears in some cases. As in recent decades the

percentage of the contribution of young mothers in the community has increased and fatigue due to the daily work of parents also should be added. So construction and equipping of such facilities is not far from mind, that parents can use these services confidently and with no need to go to the different parts of city. Discussing the effects of children's educational environments on progress and full development of them is very important.

RESEARCH METHOD

This case is a practical, theoretical research. In this research, psychological studies are carried out in order to understand the child spirits and investigate their needs. The research method in this study is in the form of analytical and applied purposes. This study attempts to identify and assess the educational environments' features and by introducing such facilities tries to inform the authorities about the importance of these spaces and the necessity of serious action in this regard. For this purpose with searching in libraries, books, magazines, etc. and extracting information provided on web pages, various features are investigated. In this study documental method.

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(Library) is used.

Paying attention to child psychology can have a direct impact on the physical quality of future children's educational environments' features. The environment and environmental factors, colours and light are some of the most important effective aspects of child development and improvement in performance of architecture environments of children.

The aim of this study is to understand moods and interests of children and provide an environment and facilities for education in order to promote the level of knowledge and the general understanding of children. Then with investigating spaces like kindergartens and understanding standards and analyzing them, we gain a detailed perception of the spaces and at last by providing solutions according to the needs of Tabriz and based on conclusions, we will come to a precise designing.

RESULTS AND DISCUSSION

Educational environments for children

Child's educational environment is a space in which children engage in various activities related to Learning. According to the observations made, it is specified that educational environments for children in the city of Tabriz are of poor quality in a way that need for comfort, attractiveness, safety, variety and totally need for a child friendly environment is desperately felt. Also, creating social relationships, fear reduction, building intimacy and joyful atmosphere in such spaces seems to be necessary.

Kindergarten is a place that creates child's love for knowing and learning, increases their general knowledge, their ability to cope with obstacles and raises their interest in the world and the nature and it is also important that in a kindergarten children remain children. Preparing for school does not mean that instead of playing, children should learn or should be forced to learn skills related to school. Educational environments for children should put such activities near group and individual activities, so called traditional education, as a break.

Studies show that during childhood, the abilities and the creativities of children are established and the best time to develop creativity and imagination is ages between two to ten years (Krippner, 1999. Azemati, 2008). During these years, child is more effected by the environment and is curious about it naturally (Azemati, 2008). While educational environments for children in Iran, such as kindergartens, lack suitable designing for children in a way that most of them are established in residential spaces or even apartments and by painting and drawing are converted to childlike environments apparently (Shafayi and Madani, 2010). In designing environments for children, understanding children is of special importance and since children have their own fantasy world, many of them, under the age of seven years old, imagine world as they want and not as it is. And because of this, the space designed by a designer, who does not understand children, is not suitable space for children. Children are always in movement and they like to act curious and explore in sync with playing, therefore their surroundings should be matched with inner interactions and provoke children's curiosity. Hence, the best places for children should be colourful, attractive, busy and disciplined, lively and at the same time relaxing and safe.

Children are considered to be a link to the past and future generations in every society. Transmission of traditions, cultures, beliefs and modifying social environment in every society is possible via children. Therefore the way of family and society's behaviour towards children is like a writing that becomes carved on a stone. Education and consequently educational environment have the greatest effect and play a significant role in mentality and civilization of society. Creating spaces associated with children's activities is required to modify the body of education and training; spaces that have appropriate conditions for physical, mental, emotional and social development for children. This can be achieved through the designing of environments considering behavioural patterns of children (Yazdchi, 2012). In today's modern world a person should be flexible and creative in order to succeed and become compatible with changes imposed on him by society (Mardomi and Delshad, 2010). According to psychologists flexible people are more developed because their life is full of experience and they have appropriate response to mandatory changes (Farhoodian, 2004). The flexibility in behaviour of a child is an ability to overcome mental obstacles; using this ability the child can change his approach and improve it (Fisher, 1386). It should be noted that although the emotional and physical flexibility is partly a matter of intrinsic, but this factor is associated with several factors, among them family support, school support and communicating with friends are considered to be effective in the level of flexibility (Allagband Rad, 2003). So a condition should be provided for children that they can embrace the changes with open arms and use various events and circumstances as an opportunity to boost flexibility feature (Mardomi and Delshad, 2007). According to Sutton- Smith this flexibility and creativity are obtained through playing (Sutton- Smith, 1974). In child development, playing is as important as good nutrition, loving and child protection (Sheridan, 2003). In addition, playing brings the possibility of participating in group activities. Researchers have examined the impact of group work on the development of creativity; they have concluded that the creativity of people working together is more developed because of the interaction of the ideas (Paulus, 2000. Mamikona, 2002).

The Role of Education in Society

'The purpose of education is to replace an empty mind with an open one' (Malcolm Forbes).

According to the useful achievements of communication science, we assume education and training as a way of informing people. In this view, the education of children is not only influenced by the words of teacher but also other elements such as nonverbal trainings and behaviour more than other factors are involved in transmitting message to the learners, so learning does not happen only in classroom (Shaterian, 2008). In designing a learning environment one should try to match environment with learner's needs, and not to force learners to match themselves with the environment (Mardomi and Delshad, 2010). Designing is a process that must simultaneously organize both cognitive

and functional beauty. Designing a building is a story whose main character is human himself. With his presence in this story, quality and state of his surroundings can evoke some of rules as: Feel the light, Know the form, Feel the space, Touch the texture, Examine the shape, Mix the colour and know the volume (Sohrabi et al. 2011). Professor Ahmad Safi one of experts in the field of education and training, reminds the physical close connection between school and student learning: 'Architects should as much as possible be familiar with psychology language, educational science and learning methods. Therefore for building a school a combination of psychologists and educational science experts, consultants, technologists, educational planners and architects should come together. Taking such a view in constructing and designing schools will make new developments possible in the future of schools and educational systems.' (Soltani, 2007).

Child development is a subcategory of child psychology field. Development means a focus on the physiological behaviour and understanding the behaviour of children from birth to maturity, which is associated with quantitative and qualitative changes. Some authors use this meaning to indicate the emphasis on growth and development rather than learning but majority of researchers use this meaning as a cover for mental development and learning and crucial consideration between them (Parsa, 1991).

Psychological theories about growth

- **Piaget:** Piaget considers children as a philosopher who understands the world as they experienced. Not only do children observe and imitate the world, they can also interpret the world. Children learn by working and this learning plays an active role in their intellectual development. Children understand only what they have experienced and they expect adults to observe what they see. Children simply believe that understanding a new experience can be result of previous experiences.

- **Rousseau:** He believes that children should be taught things that can be capable of understanding it. It is better that children's appetite for learning be fed by obviously valuable things that match their taste and interests rather than things that have no relation to children's taste, which ruins their appetite to learning.

- **Pestalozzi:** What Pestalozzi wanted children to learn was exactly what parents expected their children to learn. He believes that the real intuitive experience that is carefully organized and is designed and applied regularly is just logical basis and foundation of education.

- **Froebel:** Froebel believes that preschool children are trying to externalize and manifest their internal world, using their language and he believes that all children have adequate ability and talent to live productive, creative and useful.

- **Montessori:** She concerned about children in a world of the same size and scale of children's world. She asked for classrooms with chairs and desks that fit the size of children. Educational cases of Montessori is such that help children in analyzing intuitive effects; children who have worked with her educational methods learn both public-social skills and cognitive skills (Cole, 1995).

- **Bruner:** there are four important educational factors in Bruner's theory: motivation, intuition, learning and process of learning. Using his theory in learning environment is that students learn in a quiet environment away from any stress; conditions should be away from any sort of making fun of each other that students can express their ideas freely and they are taught to think and discuss learning courses and individual differences.

- **Dewey:** Dewey's theory shows that educating and learning are social activities and consequently, schools are social institutions where social modifications should take place. In addition, he believes that students can develop in an educational place where they are allowed to experience and interact with curriculum and all students have the ability to get involved in their own learning.

Architecture is highly effective in training people by the places it creates. Burden of responsibility for designing spaces for children is stronger due to their sensitivity. Children's perception of environment is different from ours. They perceive all images in terms of momentary intelligence and imagination (Mokhtari, 2008). Children's perception of the environment can be studied in the following three cases:

- ✓ Children's intuitive perception of environment: children determine the places of things that are interesting for them, and become happy as things are in their own places (Mokhtari, 2008).
- ✓ Perceiving shapes: children are unable to perceive shapes in detail. In a way that, they can understand shapes with angle first and then they get to understand shapes with curved edges (Mokhtari, 2008).
- ✓ Perceiving colours: colours have great influence on character of people specially children and cause exciting experiences such as laughter, joy, sorrow and sadness, peace and excitability, tranquility and excitement (Mokhtari, 2008).

So paying attention to the effective factors in child psychology can be useful to provide strategies for designing of educational environments. The three effective factors are: environment psychology, colour and light.

Environment psychology

Spaces for children should try to create an appropriate, inspiring, happy and attractive environment. A place like a park where at tender can feel happy and joyful. An appropriate environment means an inspiring place where children can develop and flourish without any unwanted mental pressure.

Robert Gifford has focused on educational environments in the eleventh topic entitled environment psychology in his book and discussed issues such as status of students and teachers in a classroom, level of noise, light, colour, weather and humidity. In fact his emphasis in on more effective and more enjoyable teaching (Kamelnia, 2007).

Philosophy of new architecture is based on this idea that as consumers of architectural spaces gets more involved in production or formation of the spaces and as they participate in creation of them, so their interest and the level of participation in activities inside that place arises (Mortazavi, 1997). Educational spaces' framework should be such that when children enter these places, get feeling of warmth and kindness.

In environment psychology, considerable number of researches are dedicated to investigate the properties of appropriate physical places, in order to satisfy various needs of human such as need to rest, having fun, eating and studying. For example environment psychology experts have paid much attention to the effects of environmental conditions on education of children (Tabatabaian et al. 2011). Observations made in this field show that some environments create more opportunity for creativity and innovation and some others make it easy to communicate and have social interactions. Based on this fact, Edward T. Hall (1966) in his important theory named 'Silent Language' believes that 'Space speaks' and 'Time talks' and this means that learning does not happen only in classroom but school's walls even carry message for students and speak to children and teenagers just like teachers and books. Long and thick walls, long and narrow corridors induce being restricted and prisoned. While flowery and green yards and clean classrooms with proper and pleasant colour suggest pace and happiness (Navid Adham, 1996).

By studying the behavioural patterns in children's educational spaces, environment psychology experts has come to more effective factors such as school size and lighting, etc. that play important role in enhancing education (Yazdchi, 2012).

Colour psychology

Another effecting factor in education is impact of colour and understanding psychological aspects of it. Mental effects of colour in environment is undeniable; consequently not having enough information about this issue will result in irreparable effects. This is why colours used in spaces are different in a prison or a kindergarten, because definitions of spaces are different (Majlessi, 2008).

Children and colour psychology

As mentioned before, colours have great effect on human personality and cause excitement. This feature gets stronger in children because their pure, simplex, cheerful and succulent soul prefers vivid colours that are combined perfectly. This is the issue that must be considered in designing, decorating and colouring interior spaces and proper colour combination of natural areas. With different colours one can display size and weight of certain things small or big, light or heavy. Basically, warm and light colours extend things and conversely cold and dark colours make things seem smaller than their own size.

Colours fall into three categories

1. Primary including red, blue and yellow.
2. Secondary that is made by mixing primary colours, such as green, orange, purple.
3. Tertiary that are made by mixing a primary colour with a secondary colour, such as greenish yellow, greenish blue, etc.

Warm colours are stimulating and cause activities and inspire clarity and happiness and they generate motions. While cold colours cause passive, calm and motionless moods and dictate sorrow and sadness. Watching warm colours increases rate of heartbeat and is useful for exciting spaces. Among warm colours, scarlet is penetrating to the extent that is spotted faster than of any other colour.

Coordination of colour and form

Colour effects should be investigated not only visually but also from psychological aspects. Colour and form should confirm and verify each other in their meaningfulness and concept. Square, triangle and circle are three main shapes that have certain conceptual and recitative properties just like three primary colours; red, blue and yellow. Square represents material, weight and specified limits and induces a sense of stretch, length, experience and motion. Square coincides red colour, weight and volume of red things coincide heavy and calm form of square. Triangles with sharp and acute angles create effects of aggression and invasion. Triangles are symbol of contemplation and their weightless state and characteristics are compatible with bright yellow. Contrary to squares, Circles gentle and moderate emotions and induce feelings of relaxation and slow and calm motion. Circles are symbol of soul that inside of which is always moving.

Bright colours are glorious in the eye of children. It is better to use coloured wallpapers or cheerful colours for the walls and also it is better to use colour and texture near each other. One can make boundaries and edges of walls more outstanding and add stars and clouds to the ceiling. Children like bright and shiny colours so one can use these colours on walls to determine colour range. Happy, free and clear colours stimulate children's imagination and encourage them to creation and creativity also emersion and advent of bright coloured walls such as using cartoon characters on small areas' walls is very useful.

The effects of colour on designing educational areas

Psychologists have found that colours have miraculous effects on the human psyche and interest in a particular colour is the illustration of mental and spiritual tendencies of people. Colour as the inseparable element of architecture, has great effect on the soul and mental moods of consumers of areas and buildings and it effects their mental and emotional states strongly. If colouring is suitable, it will result in mental happiness mobility, students' efforts and will speed up the learning process in the school. Each colour has its own message to the observers and this is the issue that has always been

investigated by researchers and psychologists (Tabatabaian et al. 2011). Children compare things with each other based on their colour to the age of six years. Consequently colour is one of the most prominent properties that should be paid attention. One should avoid severe and contrasting compositions of colouring and also colours should not be very intensive in their intensity but one should use predominantly the combination of soft and cheerful colours (Atarod, 2012). The position of colour is of high importance in children's life. In fact children live with colours. Researches show that the choosing of colour in children's drawings indicates their mental mood and as a result paying attention to colouring as a tool for educating and training children is a necessary and required matter (Sateii, 1993).

According to the researches about choosing suitable colour for educational areas, made by ACECR, these results have been obtained:

Colouring of classrooms based on students' preference is effective in educational progress, compatibility and efficiency of them. Also the features found for suitable colours are as follows:

-   White: science and contemplation
-   Orange: exhilarating and energizing
-   Pink: Joy and strength, science and contemplation
-   Yellow: energizing, anti-fatigue and stimulating
-   Red: life-giving, energizing and anti-fatigue
-   Green: stimulating, science and contemplation
-   Blue: science and contemplation, stimulating and self-possession

According to above topics one can put these three main colours including red, blue and orange in the group of children's preferences, generally age of four to six. And in the second priority one can put colours like pink, green, yellow and purple. Also colours of brown, black and gray families are of very low priority (Mosayeb zadeh, 2012).

The effects of light and lightning

Light is one of the factors that is effective in the improvement of educational areas' condition. Places with natural and bright light have positive effects on children. In other words dark places with artificial and inappropriate light have negative effects on children. For this reason choosing the light and the way of lightning in children's room play an important role and have a great effect on reading, writing, quietness and concentration of them. Suitable light prepares calm and appropriate surroundings for studying. Light and lighting can be effective in displaying a place big or small. For example installing a skylight in the entrance of a place or around it, leads to extension of that place. It is better to avoid sharp contrasts in lighting of children's educational areas because these lightings cause fatigue. For this reason, using natural and soft lighting is more favourable.

Research recommendations

The training and education for forming lifelong character of children is a very sensitive matter therefore designing educational areas should be done carefully that children be encouraged to have different experiences while they are spending time in that places. Training and education

should be comprehensive and suitable for children's individual needs. Therefore these theories should be considered in studying the designing of children's educational areas. Children spend a short time for static activities such as sitting and on the other hand they spend most of their time for playing and exploring. So filling out the papers should not be their main activity. Children should enjoy their facilities and environment and express their feelings and thus learn a lot about themselves.

Existence of continuous areas with no obstacle and with minimum discriminates in one aspect cause that children communicate with each other and do not feel isolated and on the other hand there will be a comprehensive control on children by teachers. Using sliding doors results in the development and the composition of indoor and outdoor spaces and provides the continuity of open and closed areas. On the other hand lack of private places can be troublesome and for clearing this problem one should use movable components and layouts such as portable light walls, racks and furniture and the like, in a way that children can change the environment in accordance with program of education and create the required changes in the environment.

Using plant species especially species that their leaves and flowers can be seen in different colours and shapes in different seasons of a year such as evergreen trees, deciduous trees, etc. can cause spatial diversity and stimulates curiosity of children and helps them understand the seasons better by observing the trees. Creating an enclosure like a natural jungle, devoting some space for fruit trees, planting vegetables and creating some platforms for observing plants, trees, ware, etc. are samples of interacting with the nature.

Using coloured moveable glass frames inside windows by which children can make different colours of light. Creating a safe and suitable place for playing, using window shades that make it possible for children to make the shadow of things that they have made on them. All these can provide a context for children to play.

Children always love to play outdoors. Thus providing conditions for conducting activities indoor is essential. Tabriz is one of the cold regions that cause playing restrictions in winter. Therefore to prevent child from getting sick, one can create an exciting atmosphere inside the place. For example climbing the trees that are inside, reinforcement of physical strength such as gymnastic exercises and balance of body and using attractive spaces for children to play inside is very important. For example constructing walls with windows of small or moderate size can causes excitement stimulates curiosity and improves children's sense of imagination or considering a library including books and toys can increase children's excitability or excitement. Library is a calm and relaxing place that with coloured racks prevent the atmosphere from getting steady and drowsy, the library make children more eager to study so children the joy with playing and running even in rainy, snowy or cold days.

Designing a safe and suitable place for children's playing in front of the main building that one can control children easily. A place with natural equipment such as trees for climbing, small artificial hills, tenants, mirrors and lenses, bells, shelters with triangular roofs and sandy boxes for attracting the interests of children, which leads to deciding and power of choice by the children themselves. These facilities should be various to the extent that children have more freedom in their options.

Designing spaces related to children should be in a way that has centrality and from all aspects should have a comprehensive and full view. For example designing child care rooms that surrounds the whole building which are connected to each other via corridors. In addition, existence of a place for consultation with children and educational activities seems essential. In designing areas, relationship between teachers and children is of first priority therefore relaxing rooms of teachers should be near children that they can have close relationship with each other.

In terms of architecture, using materials with high stability and resistance to atmospheric factors is very important. Using wood in rooms and doors leads to a warm, pleasant and friendly atmosphere for children. Since children's falling over to floor causes some injuries, therefore using oak can prevent these happenings to some extent.

Safety of buildings depends on the ways to get out of them. In addition, communicating paths that exist like shortcuts result in free plying of children and their curiosity improves through these paths. So it is better that all parts of buildings lead to the yards or playing yards, even amphitheaters should be connected to each other by internal corridors. In a way that these narrow corridors change to areas for learning.

The most important features of children are playing and running freely. Children love to run to infinity, so that their running path does not have any ending except with fatigue. This activity is far better than making a football field in children's areas. For this purpose, using vertical and horizontal paths between the floor and the ceiling can be a divertimento for children. For example using a ceiling in the shape of a ring, circled and wide that has safety shields is a horizontal communicating path that children can run in it to infinity. Also one can connect the roof to the ground by the means of a natural slide and provide a vertical path; this creates interest in the opinion of children. For example in rainy days, rainwater can be directed to small pools that are designed under the ceiling like a waterfall and this can evoke a view, just like a waterfall, for children. Big wide windows give the opportunities of watching these scenes to children.

The need for air conditioning seems necessary in any place. According to the importance of children's places and trying to attract more children to these places, one can use trees to adjust climate. For example one can naturally use trees without cutting them and use wind circulation by creating holes in ceilings or walls. On the one hand, this will help for air conditioning and on the other hand it helps to maintain natural mood and creation of a pleasant scenery and enhances children's nature friendly feelings.

Designing open to the sky platforms as a place for concerts, theater, shows, musical performances, dancing, etc. for children in order to learn rules of children's teams and teach paying attention to other children in a team work.

Permeability of areas and possibility of children's easy mobility without any feeling of getting lost and discovering the hidden aspects of the environment, while controlled by teachers, are attractive for children. So one can design hidden rooms inside the areas in order to create a relaxing condition. Designing such rooms keeps children away from any stress or anxiety. These rooms can be sued as a home or a hideaway in children's games and consequently will be favourite room of children.

CONCLUSION

Today increase in the population of children in Iran has led to paying more attention to the quality of designing children's educational areas. What discussed and emphasized in this paper, as a new topic, is expressing the principles of designing educational areas based on the effective factors on child psychology such as environment psychology, colour and light in Tabriz.

'Learning is not a packaged product because of its own nature, but is an inner process that is manifested as a continual discovery' (Jilk, 2002).

Learning environment, all parts of which have the ability to change into a learning place, focuses on the curiosity of children. The main factor in designing such an environment is providing some condition for children, that they can create their own learning environment, rather than being put in a place where everything is predetermined. In such a structure, the interaction between the children and the environment is formed in a way that on one hand the children make their own environment and on the other hand the environment gives form to the children's world. Undoubtedly complex psyche of man is a combination of instinctive and inherent behaviour plus acquisitive and learned behaviour. Psychologists have not yet agreed on the acquisitiveness or being instinctive of human behaviour in the environment. What effects on our behaviour, happens in the environment inevitably, and as whole life of one occurs in the environment so it forms important effects of our life. At first designing educational environments for children should be able to respond to the mental and the physical needs of them. Providing the mental safety and the calmness of environment is the first condition of suitable environment for children that underlie the children's development. Also investigating the psychological effects of colours with the effects of light are of great importance in designing children's educational areas. Proportional use of each colour can have special use of design. Glory and display of each colour next to another ones, shows its real effect and the brightness and the darkness of each colour appear better in proportion to

other colours. Changing this natural order leads to some inconsistencies.

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