

**The Effects of Colours on Preschoolers' Behaviour:**  
**An analysis of Colour-Mood Association on Preschoolers Aged 4 to 6**

**ABSTRACT**

Typically set up learning environments for preschoolers often end up, with just an interior that is only furnished with posters on walls, paste-up decorations, toys, and a typical furniture layout. In reality not much consideration or effort is put into the colour concept in the built environment. We should pay close attention to our children as users of the environment because they are in the process of developing physical, cognitive, social and emotional skills. Their interactions with the built environment can have profound effects on their later development in total. Studies have proven that children learn best when the task is challenging while at the same time maintaining low level pressure. Thus, it is vital to provide a cheerful and inviting environment to sustain the attention of our naturally extrovert preschoolers. Our environment is inevitably dominated by colours that help us to understand our surroundings better. Various studies have supported that colours affect us both psychologically and physiologically. Colours can induce sensory stimulation in our emotional realm and the whole of our being. In many occasions, designers lack the confidence and knowledge on how to apply colour to their built environment. The colourist, with very general understanding and views on colours, applies them into their environment, without much thought of the possible psychological associations. A monochromatic environment is regularly chosen and this has resulted in a mundane experience. The purpose of this study is to find out colour preferences among aged 4 to 6 preschoolers and how they relate each colour-emotion associations with the specifically given characteristics. The subjects of this study will be an estimated total of 150 preschoolers from several preschools located on Penang Island. Spaces in the kindergartens i.e. the classrooms, playroom, art room, and restrooms will be analyzed on how effective the interior colour setting in each room aids the purpose of usage. Naturalistic observation and unstructured interview will be used for preschoolers while structured interview will be applied to education administration staffs and parents.

Keywords: Colour Psychology, Interior Setting, Preschools Environment, Multiple Intelligences.

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**Introduction**

This paper explores the perception of preschoolers on space and colours in preschools on Penang Island. It is known that in 2001, the Ministry of Education (MOE) and other relevant ministries had increased access to preschool education. The review of the Education Act 1996 regulates the provision of preschool, primary and secondary education. The private sector had also complemented the government's effort. In 2002, the Education Act 1996 was amended and the implementation of compulsory education took effect in 2003, making the New National Preschool Curriculum compulsory in all preschool beginning 2003. The Malaysian National Preschool Curriculum (2003) aims to deliver an education for preschool-age children that will strengthen the acquisition of basic skills such as socialization skills and personality development. The basic skills taught at this level are communication, social and other skills (3Rs) in preparation for primary schooling.

Early childhood development programs are also instrumental in preparing the nation's young to participate in nation building. Our nation building policies are the guiding principles to generate our nation into a holistic perspective of intellectual skills and compatible with other nation, thus cognitive and social emotional skill foundation is imperative to ensure life long learning stimulation. Malaysia preschools education centres are implementing their co-curriculum outline based on the nation building policies to instil the life- long learning motivation for our preschoolers before their enrolment into formal education in primary schools.

## **Research Background**

The Malaysia **National Preschool Curriculum is based on 4 principles:**

(a) Overall & Integrated Self-Development which focuses on the development of individual's potential. Child's potential must be developed in an integrated manner, as each development aspect is influential to each other.

(b) Cheerful Learning which stresses the interest and the motivation to learn instilled through an interesting, comfortable, challenging and happy learning environment. A learning environment that is conducive fosters a spirit of loving knowledge, and later develops the child to be interested in learning with an open mind.

(c) Meaningful learning experience which emphasizes active participation of children in activities so the child can apply learning with daily life experience, to result in effective and meaningful learning.

(d) Life Long Education which requires a continuous effort in acquiring and transferring knowledge, positive values, and skills. Cheerful and meaningful pre-school education experience will foster interest for life long education.

These principles mentioned above highly emphasize on the learning experience which is related to the emotional and cognitive developments of a child. Therefore, this study aims to find out preschoolers' behaviour responses to the built environment from the perspective of multiple intelligences. This is based on Gardner's theories (1999), cited by Smith, Mark K. (Howard Gardner, Multiple intelligences and education), viewed Jan 2008, <<http://www.infed.org/thinkers/gardner.htm>> on cognitive strengths that empower individual learning abilities. This study also provides insight into emotional intelligence and brain based learning concepts, which elevate the ideas of creating a learning environment that is interesting, comfortable, challenging and cheerful.

The purpose of this research is to study the influence of built environment to a child's learning experience. The researcher's choice to analyse the built environment settings of child care facilities and preschools is rooted on the idea that young children spend most of their time in child care facilities and preschools in order to attain foundation skills which are crucial before receiving their formal education in schools. It is essential to build the groundwork for preschoolers during these formative years where their learning experiences will determine their life long learning motivation. It is acknowledged that a schooling experience that is solely dependent on the educators' guidance is not enough to sustain the child's interest. Generally, not much consideration is put into colour design for the interior of a learning environment, a general concept of how children respond to colour was commonly applied through their drawings and wall decorations.

The justification for selecting the preschools centres in Penang Island only for this research study is supported by the following factors;

- The geographic location of the island, which is small yet highly developed in terms of its socio-economy and infrastructures.
- Selected preschools in Georgetown and its surrounding areas are exposed to the same infrastructures and standard of living which provides consistency for the researcher's data.

## **Psychology of Colours**

Colour and emotional effects is the subject of this research, as may be derived from the problem statement which is, "An Analysis of Colour-Mood Association for Preschoolers". Findings from various researches on colour such as from Frieling, Wohlfarth, and Grangaard (summarized in Mahnke, 1996) have shown that colour has the psychological effects trough

visual experience. From these studies, young children, with their extrovert nature, are claimed to be attracted to warm and bright colours. These studies also showed the architecture of a built environment is significant to provide visual stimulations that also indirectly affect the child, both psychologically and physiologically.

Conclusively, this research hopes to analyse how preschoolers respond to colours. Whether these colours will generate positive or negative emotional responses will always be linked to the relationship between colour and environment. Colour is defined as a form of energy of lights; ranged from different wavelengths and frequencies, this colour range includes all the adjacent hue and for practical purposes forms the basis of a standard twelve-hue colour wheel. The twelve basic hues can be divided into what are termed primaries, secondaries, and tertiaries.

Psychology is the science which deals with the mental process and behaviour and this includes thoughts, feelings and dreams to anything a person experiences. Mahnke, F. H. concludes in his book *“Colour, Environment, and Human Response”* that humans sense colours not only about how we perceive through our eyes but also from a sensation of feeling that arouses our cognitive thought. He stated how humans perceive colours within the six interrelated factors in his *“Colour Experience Pyramid”*.

*We may assume that six basic interrelated factors influence this experience. Using pyramid; (1)Biological Reactions to a Colour Stimulus, (2)Collective Unconscious, (3)Conscious Symbolism, (4)Cultural Influences and Mannerisms, (5)Influence of Trends, Fashion, Styles, (6)Personal Relationship. (Mahnke, Frank H. 1996, p.10)*

Conscious symbolism plays a significant role in various fields, such as advertising, fashion, product and graphic designing, architecture and in our built environment. Colour symbolism have been used to influence how we perceive and interpret our own emotional statement. Mahnke highlighted that each individual has his personal colour preferences and dislikes but to trace the reason behind them is complex, because how we experience colour is influenced by the interrelationship between all the levels of the *“Colour Experience Pyramid”*. Mahnke further pointed out that the Frieling, Pfister, or Luscher psychodiagnostic colour tests can investigate our personal relationship to colour and its significance. (Mahnke, Frank H. 1996, p.18)

The relationship between how important our environment evokes certain mental conscious or emotions that subsequently affect our physical condition are stated by Mahnke who said that designers are responsible to create an environment that will not promote undesirable emotion by having appropriate visual or external stimulation. Mahke further suggested that it is worth to study the subject of emotions and how they are important in psychosomatics. (Mahnke, Frank H. 1996, p.47). Psychosomatic is about the science of mind and body; determines the mind is responsible for physical disorder and vice versa. Mahnke stated;

*Decisions about visual design in our environment should be based on an understanding of aspects of architectural psychology- especially color psychology. (Mahnke, Frank H. 1996, p.49)*

## **Multiple Intelligences**

The cognitive development of preschoolers has been studied from the perspective of Gardner's theories on Multiple Intelligence that can have profound influence on preschools education approach. This is a teaching pedagogy that elevates individual learning abilities by using the major inborn intelligence and nurtures their minor used intelligences, if proper encouragement, enhancement, and training are given. Gardner pointed out that intelligence consists of eight relatively independent intellectual abilities, namely Linguistic; think in words, Logical-Mathematical; think by reasoning, Spatial; think in images and pictures, Bodily-Kinesthetic; think through somatic sensations, Musical; think via rhythms and melodies, Interpersonal; think by bouncing ideas off other people, Intrapersonal; think deeply inside themselves, and Naturalistic; think via elements of mother nature.

As mentioned earlier, the brain based learning and emotional intelligence that are linked to Gardner's theories are best explained by the interrelationship between emotional,

cognitive and environmental settings. Lackney, J. A. (1998) (12 Design Principles Based on Brain-based Learning Research), viewed Jan 2008, <<http://www.designshare.com/Research/BrainBasedLearn98.htm>>, came out with the list of the brainstormed ideas from participants of a workshop facilitated by Randall Fielding, AIA. The outcome of the workshop enabled participants to start the public dialogue concerning the implications of research on brain-based learning in the design of school environments.

Emotional intelligence is generally defined as the ability to monitor and manipulate one's own or others' emotions. Mayer, Salovey and Caruso (2002) cited by Emmerling, Robert (Mayer-Salovey-Caruso Emotional Intelligence Test), viewed Jan 2008, <<http://www.eiconsortium.org/measures/msceit.html>> describe the followings as emotional branches in one of their publications:

- 1) Emotional perception involves such abilities as identifying facial expression, music and stories.
- 2) Emotional facilitation of thought involves abilities to relate emotions to other mental awareness such as taste and colour and using emotion in reasoning and problem solving.
- 3) Emotional Understanding involves knowing what causes the emotion and what relations they convey.
- 4) Emotional management involves understanding the implications of social behaviour on emotions and control of emotion in self and others.

Study from Stevens and Goldberg (2001) cited by Clemons, Stephanie A., (Brain-Based Learning: Possible Implications for Online Instruction), viewed Jan 2008, <[http://www.itdl.org/Journal/Sep\\_05/article03.htm](http://www.itdl.org/Journal/Sep_05/article03.htm)> also highly give emphasis to emotional and environmental conditions:

- a) Emotions are critical to successful learning,
- b) Multi-sensory input is desired by our brains,
- c) Threat, high anxiety and sense of helplessness impair learning.

Colour preferences by preschoolers are linked to warm, bright colour schemes that complement their extroverted nature. The study by Fehrman (2000, p53), showed that colour preferences by kindergarten children are not limited to only bright primary colours but also a very sophisticated colour palette with an excellent colour balance.

A few recommendations were made by Mahnke regarding colour selection for preschoolers. Mahnke does not agree that the child's need for change in hue, colour intensity and lightness can be fulfilled by pinning drawings, cartoons or cut-out on the wall. He wrote;

*Children of kindergarten ages are majority extroverted by nature. A warm, bright color scheme complements this tendency, thereby reducing tension, nervousness and anxiety. Color may be light salmon. Soft, warm yellow, pale yellow-orange, coral and peach. Colors of opposite temperature should also be introduced as accents. (Mahnke, Frank H. 1996, p.183)*

Birren (1982) also supported that bright colours and warm colours such as soft yellow, coral and peach will have positive effects. He stated that colour is needed not only for aesthetic purpose but more to provide proper emotional outlets. The stimulation of colour is good to the senses and degenerates emotions of fear and apprehension:

*Because visual and emotional interest will proceed outward, the bright, warm color scheme becomes highly appropriate for kindergartens, elementary grades, place for relaxation and diversion. Because virtually all children are born extroverts, the dynamic setting invites an outward release of feelings and emotion – and because of the release, nervousness and tension tend to be dissipated. (Birren, Faber. 1982, p. 81)*

## Methodology

The research undertakes the qualitative approach and it is guided by a few methods. This research approach focuses on the exploration techniques in acquiring data; research begins with a field study which comprises naturalistic observations and field experiments through play and interviews. The objectives are:

- to study the relationship between the environment settings and the emotional behaviour of preschoolers
- to analyse the colour preference by preschoolers on Penang Island
- to justify the colour symbolism that cause positive and negative emotional effects for preschoolers

The research hypothesis is:

- Pre-schoolers prefer more than just bright primary colours i.e. red, blue and yellow, as a wide range of secondary colours that bring positive emotional effects are also within their selection of colour preference.

The subjects for this study are 150 preschoolers aged between four and six, from 5 kindergartens in Penang Island, Malaysia. Selected preschools are from Georgetown and in its close proximity areas. The sampling methods for the selected population of one hundred and fifty preschoolers, who are from the 5 kindergartens in Penang Island, are defined into:

- Selected age groups – aged 4 to 6
- Gender difference

The researcher develops the role as a friend to the preschoolers prior to the field study. This allows the researcher to cultivate trust by providing the subjects with a complete and detailed explanation of the purpose and hypothesis of the research. The researcher introduces herself and explains the research objectives and hypothesis to the preschoolers, and the administrative and academic staff of respective kindergartens. A formal meeting with the administrator is necessary to gain a mutual understanding of the research objectives and procedures. The researcher will then plan a weekly visit to the selected kindergartens to conduct the planned field works. The objective of the pre-observation process is to make the preschoolers familiar with the researcher. The researcher makes no audio or visual recordings of the ongoing behaviour during the class except a diary report which will be assessed outside the classroom. This report will serve as a reference to be compared to the behaviour differences that occur before and during the field observation. Prior to the field observation, interviews with the school administrative staff and teachers will be carried out to gain access into the school management policy. The researcher gets to familiarize with the class schedules and any possibilities of rules and regulations to be adhered to in order not to interfere with the school administration routine.

Field study with naturalistic observation is to determine the relationship between classroom environment settings and the behaviour of preschoolers. Each of the classroom's settings is to be described thoroughly. A video recorder serves as the instrument to record the ongoing naturalistic structure of the class. Each class session lasts about twenty (20) to thirty (30) minutes. Preschoolers are recorded while they are performing their tasks guided by their educators or caretakers in each setting. The researcher's role is to take note of positive and negative emotional behaviour that occurs during each session, a checklist of frequent behaviour is to take note of the frequency of any possible emotional projection. All the emotional expression and body language occurred are to be described without ambiguity. This observation study is to analyse the relationship between the environment settings with the emotional behaviour of preschoolers

A friend role and the gain of trust are cultivated throughout a period of time, after which the researcher is ready to perform the field experiment in a naturalistic class setting. A time slot is requested from the school administrative staff without interference to the respective teacher's teaching schedule. This specific time slot is used by the researcher to perform the proposed field experiment. The objective of this experiment is to measure the level of colour understanding or colour smart among the selected preschoolers. The following task is to discover how preschoolers associate colour with specific emotional experience. Three emotional expressions have been pre-determined namely happy, neutral and sad.

Here, the researcher embarks on the field experiment. With the assistance of the class teacher, the researcher designs a task to be accomplished by the preschoolers. Preschoolers complete a colour associative task to specifically explained characteristic by voting. Instruments used here consist of different coloured chips and three identical boards with the designated character. The preschoolers vote for the colour of their choice after having been informed of the objectives of the voting process. The teacher becomes the medium to convey the subjects of study; story telling of the three different characteristics is to generate possible emotional effect among preschoolers towards each character before they vote. The three characteristics that are designed to induce the emotional effects are happy, neutral and sad.

The researcher gains more understanding about colour association or colour symbolism among preschoolers by conducting unstructured interviews with open ended questions combined with projective techniques. The preschoolers then move into the play phase that indirectly allows for unstructured interviews to take place. The researcher gathers a small group of preschoolers consisting of three (3) to five (5) subjects. Instruments used are video and tape recorders to record the ongoing interview sessions. The researcher illustrates the images of their interior of the preschool centre on a computer screen, followed by inviting them to choose their preferred colour if they wish to repaint the interior of their environment. The researcher then displays to the group of preschoolers the applied colour and further asks for their opinions using open ended questions. Questions asked are aimed to find out how preschoolers associate colour with their surroundings and possible factors which influence their colour choice. The following questions are to be asked during the unstructured interview;

Before the interior projection:

- What is your favourite colour? Why?
- Which colour do you dislike? Why?
- What objects do you think of when you see this colour?
- Do you wish for your room to be painted in this colour? Why?

During the interior projection

- Do you like this colour?
- Which part of the room do you wish to paint with this colour?
- How do you feel when you see this colour?

The researcher makes another effort to gain some insight into the preschoolers' colour preference by conducting a structured interview with the parents and school's administrative staffs. The parents and teachers of the selected preschoolers will be asked with structured questionnaires to fathom further the survey on their children's understanding. The data collected here will be analyzed to verify the degree of colour preference among preschoolers. Information gathered from these interviews will be able to provide additional information that is helpful to justify the colour preferences among the preschoolers.

### **In progress work**

Researcher will carry out a pilot study to test the research hypothesis and research questions before proceeding to the full scale study. Research questions will be tested upon preschoolers whom researcher knows to test the validity of interview questions and methodology. Then, the first preschools centre will be approached to carry out the design structures within a time frame before making the full scale study for the research. Time frame designed for the pilot study estimated to be conducted within 10 weeks; all data are to be collected from the fair amount of 30 preschoolers from aged 4 to 6, their parents and teachers. All the methodology approaches above will be tested upon the selected school. The data collected here will be put into analysis to verify the validity of research objectives.

### **Anticipated outcome**

During the study, researcher gets to access to different cultural and background of preschoolers; different language approach will have to apply to different preschoolers in order

to deliver research subjects clearly. Estimated minority of preschoolers will not give full cooperation where they might be carried away by other possible distractions. In that case, researcher will have to exclude the possible data which are not valid. However, adding the total number of preschoolers from each schools will help to increase the reliability of the study.

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