# The Design of Physical Environment's Classroom Compatible for Developing Activities to Reduce Autistic Disorder

NIPHATTHA NOIPRAMAT

A THESIS SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENT FOR THE DEGREE OF
DOCTOR OF ARCHITECTURE PROGRAM IN MULTIDISCIPLINARY DESIGN RESEARCH
INTERNATIONAL COLLEGE
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|---|---|
| **Thesis** | The Design of Physical Environment's Classroom Compatible for Developing Activities to Reduce Autistic Disorder. |
| **Student Name** | Niphattha Noiprawat |
| **Student ID.** | 52600402 |
| **Degree** | Doctor of Architecture |
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| **Thesis Advisor** | Assistance Professor Dr. Chumporn Moorapun |

# ABSTRACT

The purpose of this study were 1) To analyze the behavior of children with autism and developmental activities taking place in the environment 2) To compare the impact of the physical environment within the classroom and developmental activities that contribute to reduce defects children with autism 3) To present a design guideline of the physical environment within the classroom and developmental activities that contribute to reduce defects children with autism. There are three main symptoms of autism including 1) impairment in managing and commanding 2) impairment in processing social information, and 3) impairment in processing sensory information and impairment in learning. Therefore, this study seeks to identify what environmental factors and considerations contribute most to the ASD friendly classroom and we questioned that how to design Autism-friendly classroom which considering on physical environment factor and the development of Autistic children. Quantitative research could be found out the result in several ways. This study evaluated the results after occupying space (Post Occupancy Evaluation: POE) is one method to study the data to be analyzed to derive answers to the research. Moreover, this study used the Test-Retest Reliability for this study in order to collected accurate and reliable data. In this study uses one ANOVA and T-Test is an analysis of the quantitative research statistical test T-test analysis to compare the factors within each variable environment. The study used Purposive sampling method, in order to obtain appropriate sample for the study. Behaviors of 46 autistic children age between 3-7 years old were assigned to participate in therapeutic activities for a year. Including, Special education center, Bangkok and Institute Saeng Sawang Foundation, Bangkok. By divided samples equally in each selected school; there are 6 classrooms in 2 environments.

Based on the findings, physical environments of the classrooms by set up the access area sequence and using symbols in the events sequence can reduce defective management dictates of children with autism. Moreover, characteristics of physical environment of classroom can reduce the social development and interaction difficulties of children with autism related to the environment in five factors: 1) the activity area size per a child should be 0.50-0.70 Sq.m. 2) a capable of space should be flexible 3) the seat position between teachers and students when work in group should be 1.21-1.50 meters 4) The distance between the seats of teachers and students when work individual should

be 0.00-0.30 meter 5) The distance between teacher and student when work front of the class should be 1.20 meters.

Characteristics of physical environments of classrooms can reduce impairment in processing sensory information from the perception of visual stimuli of children with autism. Based on the finding, the behavior of looking at other things rather than the activities can be reduced by all studied environmental factors, as follows. (1) The classroom should be decorated with non-complex or low-complex pictures. (2) There should be no mobile hanging. (3) The distance between the seats and the doors should be 4 meters. (4) There should be the opening at the eye level with the size of 6.50-7.0 Sq.m. (5) The proportion between the size or the opening and the room size should be 6%, 10%, 11% or 16%. (6) The view seen through the opening should be both passive and active view. (7) The distance between the activity area and the area that keeps the materials should be 0.30,1.60,1.70 or 2.2 meters. (8) The area of the environment should not be partitioned. (9) The distance between other classrooms should be 5 meters. (10) Can be using audio during the development activity for children with autism in the classroom.

The environmental variables were limited to the above nine variables, since the researcher wanted to study the authentic environments where the participants were studying. Therefore, other variables, which did not exist in the studied environments, such as the use of fluorescent lambs or incandescent lambs and the environments with air-conditioners or fans, were not studied. There might be new findings, which can expand the knowledge if these factors will be studied in the future.

## ACKNOWLEDGEMENT

I Would like to express my very great appreciation to Associate Professor Nopadal Shachaisaree,/Dr. and Assistance Professor Chumporn Moorapun,/Dr. for their valuable and constructive suggestions during the planning and development of this research work. The generous devotion of their time is very much appreciated. This research support by The Royal Golden Jubilee Ph.D.

NIPHATTHA NOIPRAWAT

# Table of Contents

Contents Page

# Table of Contents

Contents Page

# Table of Contents

# List of Table

# List of Table

Table Page

# List of Table

Table Page

# List of Figure

Figure Page

# List of Diagram

Diagram Page

# Chapter 1

# Introduction

## 1.1 In the research of environmental Background and problem statement

Modeling affect children's development, case study of environmental design contributing to the development activities of autistic child offers the significance with characteristics of environment that impacts on development activities of autistic child since the environment is a reason that can cause appropriate or inappropriate behavior. Umaporn Trangkasombat (2002) states the good environmental management is important to help autistic child to achieve peace and live daily well which means a safer environmental management has regulations according appropriation. Moreover, the environmental- based treatment management in the form of Training and Education of Autistic and Related Communication Handicapped Children (TEACCH) has identified that environment helping autistic child the most is environment with uniqueness. In the absence of such conditions, autistic child is unable to process information in a way that will create new learning. Therefore, it can be seen that environment is a tool for development of autistic child's potentials to be appeared and environment created has the conditions and factors that are important and have direct and indirect influences to people with disabilities. As an architect, John Jenkins has confirmed that the design is relevant to people of all ages and in all types of buildings. By referring to designing the area for education of children with autism, as in principle, children with autism should be able to cope with the design of the space around them and architectural science needs to consider the impacts on inhabitants, especially those who suffer from autism. It is needed to understand the symptoms of autism since individuals with autism have particular needs in order to let them to get to know the area of environment and to avoid the difficulties of daily life under such environments and result their improvement in future (Scott, I. 2009 as cited in Pilar Arnaiz Sánchez).

Symptoms of autism (Autistic) lack of development of social, language and interpretation aspects and have inappropriate behavior characteristics and interests. Each individual will be different in various patterns, but they share common things

including living in self-alienation and the lack of interest in the environment, interesting with less environment, rarely talk or lack the ability in verbal communication, maunder, neither respond when being addressed nor maintain eye contact, but are too much obsessed with particular behaviors, not care of other, play in inappropriate way, not be able to make imagination, interest something with absorbed attention, and have short interest. Because of disorder development about building relationships with the public, as a result, children do not accept things from other people or have a behavioral response to stimuli for a short period and are easily distracted from things around them (หน่วยศึกษานิเทศ กรมสามัญศึกษา กระทรวงศึกษาธิการ, 2544).

Assertive, intent and concentrated meditation with what thought and acted on, as a result, will cause us to have a greater intelligence. Because children with autism have structural abnormalities of brain function, some central system, and impairment of some neurotransmitters, they have short concentration in doing activities resulting in the lack of opportunities in social activities. Therefore, the development meditation of the child with autism is absolutely necessary. How to adjust the behavior and enhance learning makes maintaining appropriate behavior, stops inappropriate behavior, and creates a new desired behavior. Moreover, the particular impaired characteristic of children with autism will determine needs of the various physical environments (Bradley, Robert H.et. al.). What are the characteristics of the physical environment patterns appropriate with particular characteristics of children with autism?

Learning environment is important thing to promote the development of children with autism since environment is something that can attract and stimulate the interest of children while doing activities. Thus, researches address that different environments within classes will affect the level of different children's distraction depending on the sitting manner of doing single or independent activity, sitting manner of doing activities with teacher, teaching and using equipment. These are the interfered factors to child with a different variation (Maureen A. Conroy, Jennifer M. Asmus, Brian A. Boyd, Crystal N. Ladwig and Jennifer A. Sellers.2007). The differences of physical classroom's environmental factors will encourage the child to act behavior in different ways (Conroy et al., 2004; Haring & Kennedy.1990). These factors have contributed significantly to the study. However, they do not indicate the

specific characteristics of such factors of how and directions of distractions are proceeded. Creating a physical environment can provide interaction for children with autism to develop social interaction. At the same time it can also reduce the causes of problems (Pilar Arnaiz Sánchez). What are characteristics of how built environment creates interaction?

The physical environment is part of the therapy as in mean of tools (Margaret H. Amanda, "How Autism Treatments Can Help Your Child Cope").

Therefore, the selection of the study area within the center of promoting the development of children with autism services is appropriate and compliance with this study. The issue of the physical environment within the center of promoting the development of children with autism services can digest the physical environment from study and research, literary, concepts and theories which is the gap for further studies and can be expanded from the original concepts in many parts, as for example.

The too small size of a classroom of children with autism can cause discomfort affects the behavior of children while the too large size of a may make children feel confused because they do not know how to operate activities in classroom (ผดุง อารยะวิญญู 2546. หน้า 34). Space using for doing activities should be wide enough for a child to adjust their behavior properly in order to aid benefits in different skill trainings (Beaver,C.2010 และ Ian Scott2009 และ Richer,J.M. & Nicoll,S.1971). However, the research does not clearly specify the size; they just told that it is not too small or too wide. It should be wide enough to fit wherein the size of the room is a space of research study to answer that question at the appropriate size for the child with autism under the conditions of this study.

The area within the environment should be flexible and adaptable according to the event and the use of space for both small and large. This is followed to the nature of activities that took place and children with autism learn better in an environment that provides a break out area (Lorma Wing, 2527 cited in Valle de Kota Times Restaurants Noonan 2546), (Beaver, C.2010 and. Ian Scott2009 and Richer, JM & Nicoll, S.1971) and (Khare, R. & Mullick, A.2008 and Vogel.2008 cited in Pilar Arnaiz Sanchez), in which the research referred above specified the feature of area as flexible and has classified them. However, it did not specify what areas look like exactly that affect for the child's autism better learning. This can be taken to study

to find the conclusion in the environment, flexible space and the size of the space activities in the future.

The seat in the classroom allows interaction and effectiveness with students based on the specific characteristics of the child. It has an unstable position of sitting between them which affects the control behavior (Display Mode Trang's Treasure in 2545) of the data indicates just that sitting position between them affects the control behavior. However, it did not specify the feature of the seating position and how to control the behavior. The issue became to a study topic about the sitting position between teachers and children with autism. It also can be extended the distance between teacher education issues for children with autism because the distance may be part of the factors controlling children's behavior with autism as well.

From the examples of research literature shows that the concepts and theories above, thus the importance of creating an environment fosters development for children with autism. The children with autism are the children with the concentrating problems on learning. It is one of the most important elements in conjunction with the development. However, as research on the environments affect to children with autism, it does not have any identifying factors and characteristics to the environment relevant with the activity or activities contributing to the development of children with autism clearly. It is important to make the study environment in the areas where the activity development of children with autism within the learning environment to guide the educational model suitable environment further.

### 1.2 Problematic Issues

It is on the factors and features of environment research affecting the environmental modeling within the classroom activities contributing to the development of children with autism.

### 1.3 Research Question

**The main question 1:** What is the characteristics and behavior of children with autism for each group?

**The main question 2:** What is the physical environment is conducive to the development of children's activities autism looks like?

**Sub-questions 2.1**: Which type of physical environment in any manner can reduce fault management dictates of children with autism?

**Sub-questions 2.2:** What type of physical characteristics and activity can reduce impaired social information processing of children with autism?

**Sub-questions 2.3**: What type of atmosphere can reduce impaired information processing sensory stimuli, perceptions, and learning disabilities?

## 1.4 Research Objectives

1.4.1 To study the characteristics and behavior of children with autism that is consistent with the symptoms of children with autism.

1.4.2 To study of developmental activities affecting the development of children with autism.

1.4.3 To study the impacts of the physical environment affecting the development of children with autism.

1.4.4 To suggest the factor in determining the design of the physical environment within the area of developmental activities for children with autism.

## 1.5 Scope of Research

This study collected data samples of children with autism, aged 3-7 years, with development activities within six classrooms, two rooms in schools, including Special Education Din Daeng Center and Saang Savang Klong Tan Foundation.

**1.5.1 Variable Research** There are two variables are independent variables and the dependent variable.

Independent variables are variant expected to cause an approach to modeling the environment affect children's development. Study design environment for behavioral therapy for children with autism which can be categorized as follows:

- Specific defects and limitations of children with autism in learning and Development

- Development activities for children with autism.
- The environment for development activities within the education of children with autism is divided into two parts: a variant of the physical environment and the interaction of people in the area.

Dependent variable is the number and feature of the behavior of children with autism that affect modeling environment that promotes development.

**1.5.2 Duration of data collection**

The time to collect data field on the environment take a survey form and the physical environment surrounding of six environments platform for 1 week. For the behavior issues and recorded information about environment for 2 weeks to complete within one week for activities and events, and another one week to increase the reliability of data on the behavior of children who do the same in the old environment.

**1.5.3 The group of main theories in research**

The theories used in this research are the characteristics of children with autism, the development potential of children with autism, the concept of the relationship between the environment, and the symptoms of children with autism.

**1.5.4 Research Content**

The content of this research consisted of a total of five chapters.

Chapter 1 Introduction shows the importance of the research question and the definition of the scope of the research is expected to be the framework for research and associate each variable with the objectives and research questions.

Chapter 2 Literature and related research, it shows the collection summary and analysis of literature and related research. The group is divided into three areas which include theory, the characteristics of children with autism, the development potential of children with autism, the concept of the relationship between the environment, and the symptoms of children with autism.

Chapter 3 Research Methodology demonstrates about research design, research process, and conversion defines the concept as operating data analysis and quality assurance research.

Chapter 4 Research Result, it presents the findings as a basis for building a research-based approach to observing the behavior of children with autism, data

analysis and results summary on the other objectives of the research and the research question.

Chapter 5 Discusses the results of the research, it explain that the results of research and findings to the concepts and theories of past research. The discussion was based on the research question.

## 1.6 Definition

**1.6.1 Environment** is surroundings things within the classroom, children with autism can be divided into: 1) the physical environment and 2) the interaction between people within the area, special education classrooms, 3 classrooms, public institutions and Saang Savang foundations 3 classrooms for a total of 6 classrooms.

**1.6.2 Development Activities** (Therapy Activities) is an activity that takes place within surroundings to adjust the behavior of children with autism, and make it suitable for the development and sustenance consisting activity log Single Event recreation and group events.

**1.6.3 Autistic Children** are children with impaired language development and social communication, inappropriate behavior and interests. They are aged 3 to 7 years and participated in the development of environmental studies.

## 1.7 The Expected Result

The benefit of ergonomics design is to know autistic children's specific characteristics which affecting the research to characterize the sample. It is also the benefit to know the type of activities within the environment to determine the form and design research, and known the factors and the environment in the study area to determine the variables studied. This is for obtaining the study guideline and research methods for the study of different variables that affect the creation of a simulation environment that facilitates the development of autistic children, and a modeling environment that promotes development autistic children. It also generates educational theory, environmental and development potential of autistic children. These activities are created in terms of proving the theory of learning environment for autistic children, design theory and creating an environment for autistic children who has never studied before.

The benefits of medical science are to discover the unique characteristics of autistic children who are related to creating an environment to be used for the preparation of the development of autistic children. It includes the factors and the importance of the link between development activities on the environment which affecting the development of autistic children. It is used to improve the environment accordingly, and can be a model of the environment conducive to the development of autistic children. Moreover it can also be adapted to use in the relevant authorities department.

### 1.8 The Research Supporting Source

The study was funded by Royal Golden Jubilee (RGJ) Ph.D. Program.

Research framework

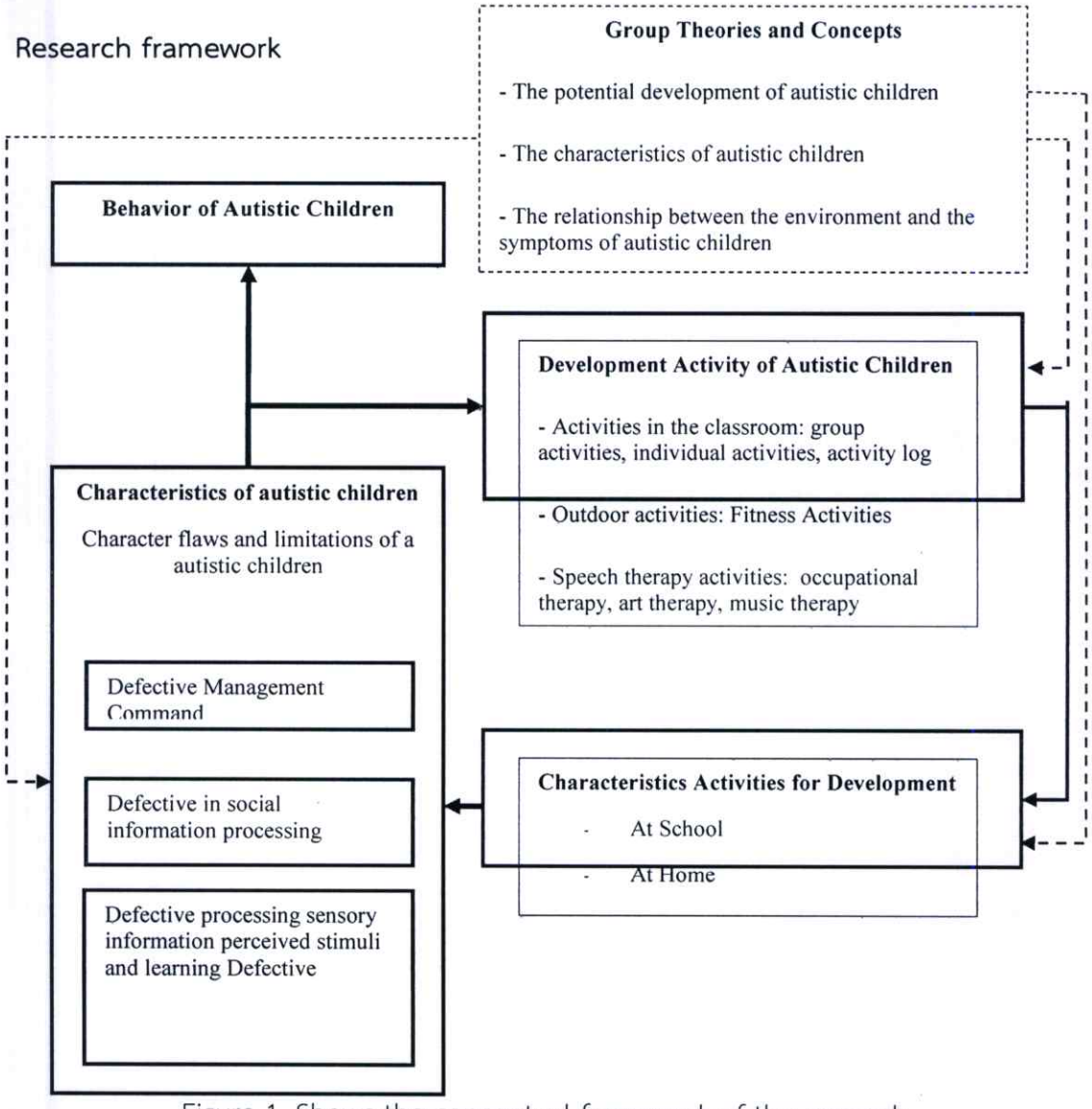



Figure 1. Shows the conceptual framework of the research.

The links of each variable with the objectives and research questions.

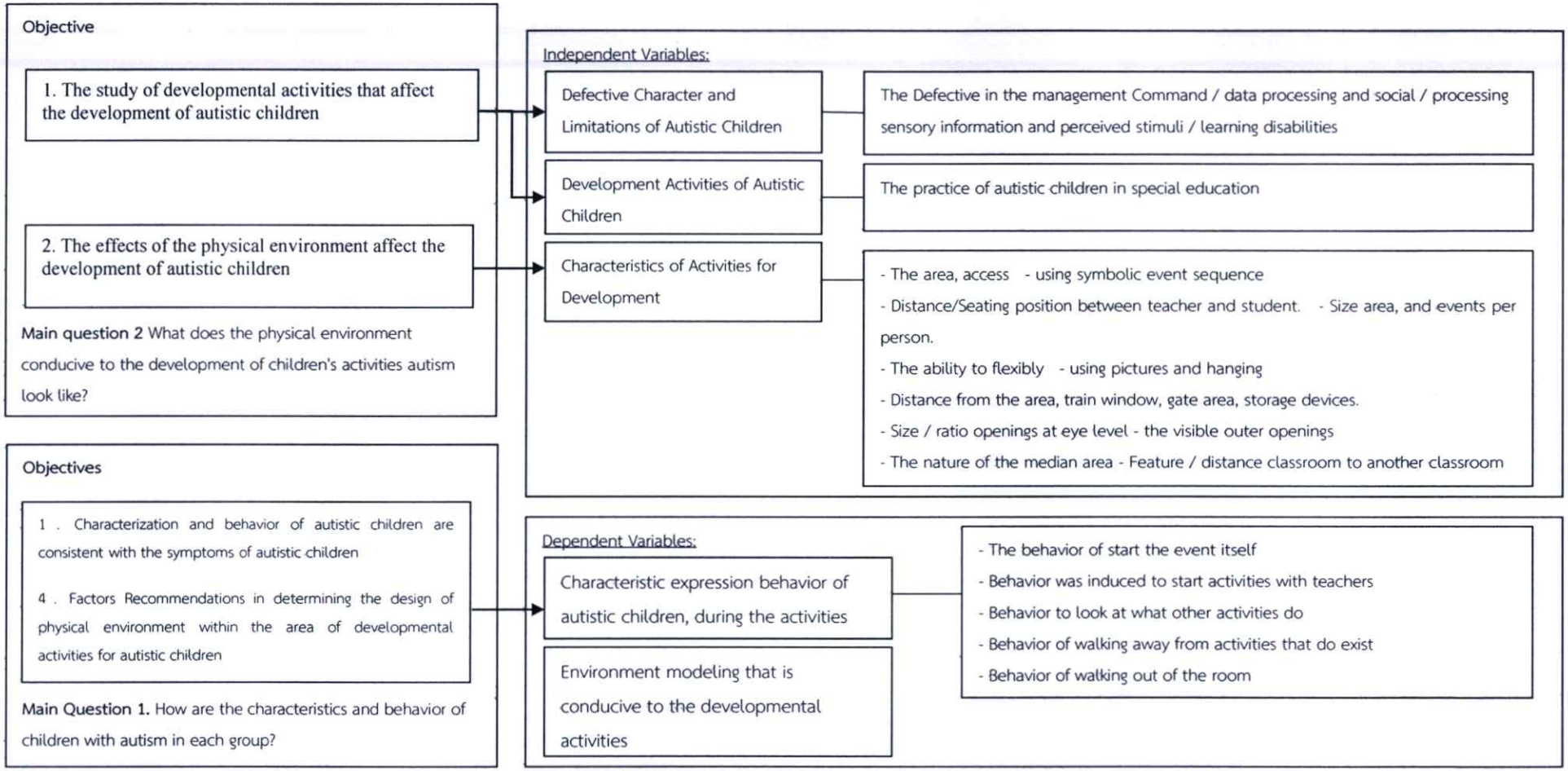



Figure2. Shows the links of each variable with the objectives and research questions.

# Chapter 2

# Literature

In the research of the model environment affecting the development of children. A case study of environment design for behavior therapy of children with autism. Is related to the characteristics of children with autism. Devalopment environment and special education. The researcher studied documents relate research. This concept can be used in this research are five main headings is:

1. The concept of characteristics of children with autism.
2. The development potential of children with autism.
3. The concept of the relationship between the physical environment to the symptoms of children with autism.
4. The special education.
5. The concept of methodology involving people with autism.

And researching the subject. The content and the importance of issues related to the research literature and summarized the research involved in this chapter. The details are as follows:

## 2.1 The concept of characteristics of children with autism.

Review of the literature on the concept of the characteristics of children with autism can issue a variety of topics are as follows:

2.1.1 The definition of autism symptoms.

2.1.2 Etiology

2.1.3 Common problems and defects.

2.1.4 Problems and impaired learning.

2.1.5. Behavioral and emotional problems relating to the environment.

### 2.1.1 The definition of autism symptoms

Autistic Disorder or Autism a derivation from the Autos in Greek means self means living in a world of its own, or run away from reality. An unusual brain one occurring in childhood. Discusses the child with this disease (Autistic child) call the disease. "Autistic" is a term used to call with specific behavior one. Or Autism used to call the children show that ah because the patient has ignored the people around as a world of their own. This disease has recorded for the first time by a psychiatrist of Switzerland, Yu Jen blue in the 1930s 2454 by noting that a group like the isolated from the society around them. Like how to live with others in society. But this disease do not know each other. That is collected and classified as abnormal status of the 2486 by American psychiatrist named Leo Kanner.อุมาพร ตรังคสมบัติ 2545, นิชรา เรืองดารากานนท์ 2551, วัลลภัตม์ โคตะนันท์ 2546

Children with autism refers to children with severe impairments in communication, social behavior and learning disabilities often occur in childhood. These children have difficulty understanding the concept of user recognition, which resulted in a child can not learn well lack of understanding of the subjects. There are problems in communication and friends, ผดุง อารยะวิญญู 2533

Abnormal brain will show symptoms 3 big side.

1. Disorder and social interaction with others.
2. Disorders, language and communication.
3. Disorders of emotion and behavior.

In children with autism, who may be impaired in all three aspects together. But each will have a different intensity. The impairments are quite broad, covering many aspects of the development of medical disorders, autism is classified in the group known as Pervasive Developmental Disorder or PDD called several developmental disorders. There are many diseases that are common in this group of Asperger's syndrome very good (PDD or PDD-NOS)

Autism spectrum a term used to describe the all children with deviant behavior disorders. In the past, the name may be different, whether it is good or autism

syndrome. Aspen's Burger because there are different elements. It features a wide range of behaviors.

**Symptoms of Autism Refers to children with deviations in social skills or interacting with others. Communication skills and have repetitive behaviors or interests specific and difficult to change. The total represents a deficiency disorders. Or delay age clearly all sides. Or is just some side might have the ability or wisdom from below normal to much above the common.** (นิชรา เรืองดารากานนท์ 2551 หน้า 2-3)

Autistic disorder is a disease that is very different. There are several symptoms and severity vary. Since little harsh to say so or a state school for mentally retarded until he can get his doctorate. Because the symptoms are relatively wide scope. This disease is medically known as Spectrum (sometimes referred to as Autistic Spectrum Disorder, or ASD) may be divided into three levels is

1. Minor children often intelligent, develop good enough to use language learning with normal children perhaps called PhD. Maybe call this group that High functioning autism.
2. Moderately severe children have social and language development limited. School is not high, only the group first. But can help yourself well fair.
3. Severe mental retardation children are associated with language and social development have low self-help not to have care for the rest of life.

Each child will have more or less depending on how much the brain that is impaired. In children with autism from physical ailments such as congenital rubella. Symptoms are often worse than children with no physical ailments. Children with mental retardation with severe symptoms than children with a better understanding.

The start of symptoms according to the diagnostic criteria symptoms begin before age 3 years and generally cannot be wrong. Common in boys than girls at a ratio of 4: 1 Children with autism often have symptoms than boys. A level of intelligence (IQ) lower than a brain disorder. As well as having more seizures (อุมาพร ตรังคสมบัติ 2545. ช่วยลูกออทิสติก หน้า 3-8)

IQ measurement has found that 10-15 percent, with more than 80 IQ.

25-35 percent, with approximately 50-80 IQ, which is in a group of retarded son to line a little retarded IQ levels remaining below 50, which is, in the medium group of retarded until the violence. (อุมาพร ตรังคสมบัติ 2545. ช่วยลูกออทิสติก หน้า 84)

ผดุง อารยะวิญญู 2546 Says even academics are children with autism is different, but many of the groups in the prevalence of children with only certain groups are very common. Some less common the table below shows the top 10 in problems of children with autism, a spectrum. Only the six major groups.

Table 2.1 Show the severity of the problem and the problem of children in six categories.

| Problem | Autistic Disorder 1 | Asperger's 2 | LD 3 | SPLD 4 | NVLD 5 | Hyperlexia 6 |
|---|---|---|---|---|---|---|
| 1. Understanding the language. ( spoken and written language). | **** | – | **** | **** | – | – |
| 2. Delays in the wording | **** | – | *** | *** | – | –* |
| 3. The use of language in conversation | **** | **** | – | *** | *** | *** |
| 4. Understand the emotions of others. | **** | **** | – | * | * | * |
| 5. Eye contract. | **** | **** | – | * | * | * |
| 6. Limited attention. | **** | **** | – | ** | ** | ** |
| 7. Play with friends. | **** | **** | – | * | * | * |

| Problem | Autistic Disorder 1 | Asperger's 2 | LD 3 | SPLD 4 | NVLD 5 | Hyperlexia 6 |
|---|---|---|---|---|---|---|
| 8. play by imagination | **** | **** | _ | * | * | * |
| 9. Dimension and distance. | different | * | _* | * | *** | _ |
| 10. Muscles | * | * | _ | _ | **** | different |

-No Problem *Have a little problem. * Some people may have some problems
** Moderate problems ***Quite a lot of problems ****Most problems

From the table shows that Autistic Disorder is a disease problem, but in some aspects of the disease, some symptoms do not appear, and there is much less certain, different symptoms.

**2.1.2 Etiology**

The disease is caused by disorders of the brain since birth. The factors that cause the brain. Wise for the

2.1.2.1 The growth of brain disorders

2.1.2.2 Chemicals in the brain malfunction

2.1.2.3 Physical disease affecting the brain

2.1.2.4 Immune system disorders

2.1.2.5 Genetic

2.1.2.6 Certain chemicals

2.1.2.1 The growth of brain disorders While most fetus, some born at birth or after. Examination of brain tissue showed that some brain cells are cells soft, not grow with age. Some have the structure of the brain tissue with a role in perception. Data processing and response to stimuli, are small and have a lot more than normal. Which can explain why autistic children are awake or be a condition too. Scientists believe that children don't communicate with others is trying to reduce community awake this. And scientists also found that something might happen to the brain stem as a

light. In the womb the other brain misgoverns continued to a chain of causes and strange behavior.

A study of newborn found that a protein called growth factor than normal brain disorders have. The special type of x-ray equipment. Also known as MRI revealed that some small part of the brain called Cerebellum is smaller than normal. The examination will be found on PET's work. Brain cells left and right are not equal. And work together especially the brain and to the side of the neostriatum Thalamus.

2.1.2.2 Chemicals in the brain malfunction serotonic a key chemical messenger in the brain that control mood. And social behavior It is also vital to the growth of the brain to another. Make language proficiency of children, which is controlled by the left hemisphere of the brain, as well as the ability to see. Which is controlled by the right brain has some substance, which is a type of morphine Opioids increase. Which is to inhibit the growth of the nervous system. Upset the balance and immune worse. Some studies have found that children with autism have low blood substances. Neurotransmitter Variability in brain function Elimination of certain substances in the body did not do well. And the protein coating the intestinal problems. So many substances seep into the body more easily.

2.1.2.3 Physical disease affecting the brain

Most children with autism have a strong body, with only 1 in 10 patients with physical ailments associated with diseases such as Tuberous Sclerosis gene. Children will have the skin disorder. A brain tumor with mental retardation and seizures Rubella, congenital blindness, deafness, mental retardation and heart disease. Syndrome is a chromosomal disorder. A viral infection of the brain cause brain damage and autism symptoms ensue.

2.1.2.4. Immune system disorders. In children, some have the T-cell substance that help the immune system in the body at a low level.

2.1.2.5 Genetic. Found that there may be multiple chromosome abnormalities, especially the 2, 7, 13, 15, 16 and 19.

2.1.2.6 Certain chemicals. Someone noted that many children have symptoms after online consciousness hood vaccinated against measles,

mumps and rubella vaccine, so that this group can cause disease. Currently no evidence that supports this idea.

Currently, scientists believe that autistic as disease caused by disorders of the brain, which has several channels in the brain size is larger than normal. There are abnormalities in the metabolism and limbic brain structures that control emotional expression and reading other people's emotions, Cerebellum with an unusually small or large overall brain size is larger than normal. Beef brain and more children will have grown, but some in the head is small.

By the child's brain disorder has both autistic in the structure and functioning of the brain, but are different in each. Impaired brain development in the womb or during childbirth may be already. This disease has not been raised as a result of bad parenting, but how could be factors, symptoms of the disease, the more the better or not. (อุมาพร ตรังคสมบัติ 2545. ช่วยลูกออทิสติก หน้า 12-17)

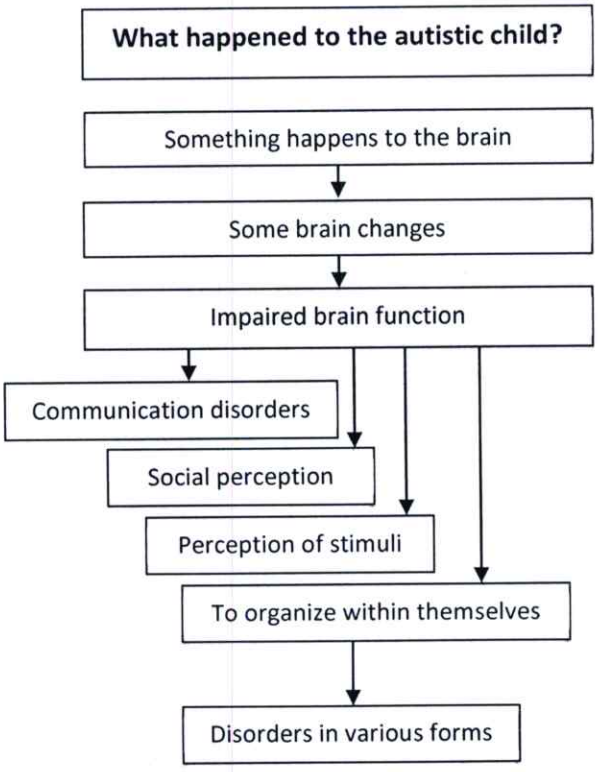



Diagram 2.1 Show what happened to the autistic child

**2.1.3 Common problems and defects.**

**2.1.3.1 Impaired emotional.** Mean have impaired in the perception of emotional states of others. Unable to understand and meet others properly also cannot read body language, such as facial expression, gestures, including what to tell the people. If the child or adult, male or female.

**2.1.3.2 Impairments in social interaction.** An important and very clear. This problem is caused by impaired thinking and understanding. Because the autistic children can read people's mind. As a result, the children have no interest to share with others. Don't understand what others think could divide the experience.

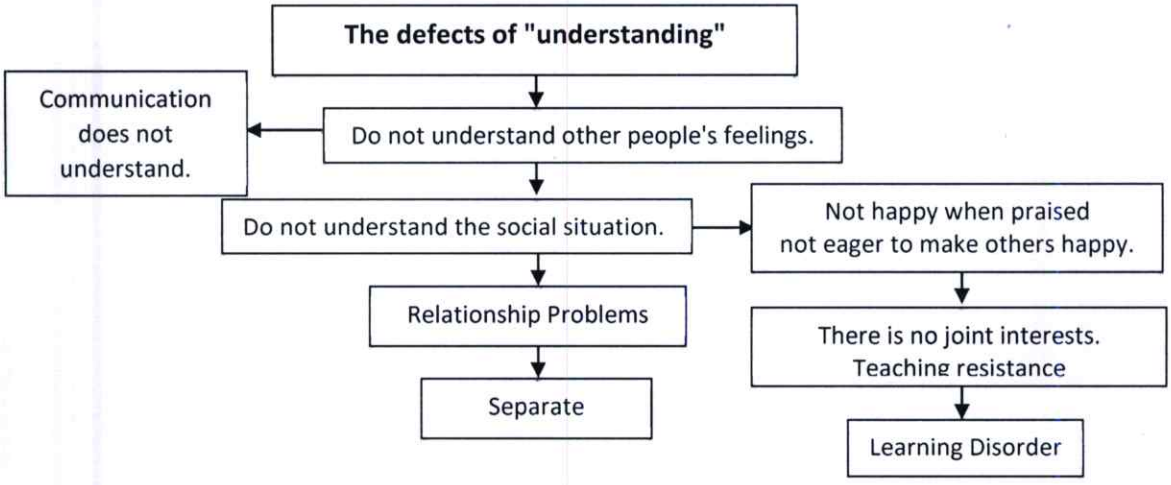



Diagram 2.2 Show cause and effect, the defects in "understand"

**2.1.3.3 Defect distinguish between true and false.** Autistic children cannot distinguish between real and fictitious.

**2.1.3.4 The deficiencies in the administrative order.** Children with autism lack social skills indifference does not recognize things because the brain lacks the ability to manage orders in planning the coordinated control behavior according to the procedure.

**2.1.3.5 Impairments in processing social information.** The children with autism secession. And lack of social skills may be because the brain cannot

distinguish between social stimuli. To other stimuli such as children, the women wearing black skirt "mother" because not differentiate. In addition, children lack the ability to manage. And self-control when it comes to recognizing and processing social information. When there are so many children are confused, like alone.

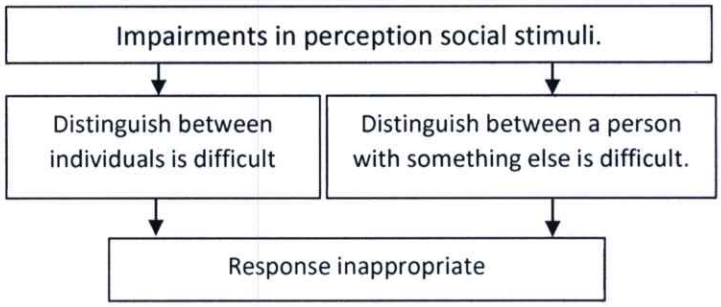



Diagram 2.3 Show cause and effect is impaired in the perception of stimuli oriented society.

**2.1.3.6 Impairments in processing sensory information.** Children are shortcomings in the integration of sensory information received. There is a perception that confusion and are sensitive to sound waves. And stimuli around them are too afraid of loud noises, and sensory perception disorders. This may be a touch-sensitive. Too much or too little Cause retreated frightened and excited mood.

Children with the perception of stimuli. Problems in the perception of stimuli can be described as follows.

Are interested in specific stimuli selected. Children will be interested in stimuli and ignore one other thing because the perception that others are sending signals to get less than people with normal development is slow. Difficulties with social interaction.

Too much stimuli vulnerable because children can't screening stimuli that arrive simultaneously, which cause confusion.

Focusing on detail. Children will observe details, particularly visual. As well as the noise, but the problem is that children do not know those details, however, and often ignore important wrong details.

The distracted concentrate. Children often concentrate on long only what self interest. But what don't care to live only a moment. But when things happen simultaneously stimuli. Children will focus not confused, stress concentration short, hyperactive, and to concentrate not stable cause learning fluctuate. (อุมาพร ตรังคสมบัติ 2545. ช่วยลูกออทิสติก หน้า 20-22)

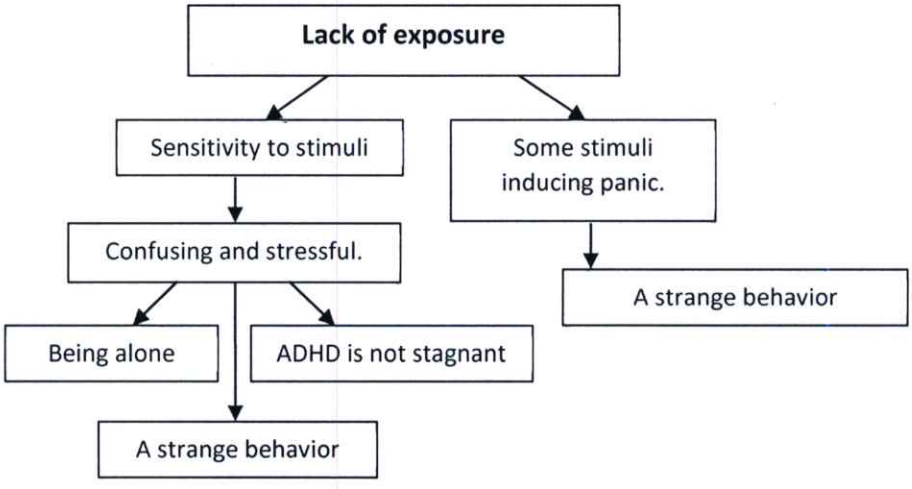



Diagram 2.4 Show cause and effect impaired exposures.

**2.1.4 Problems and impaired learning.**

What may hinder learning of autistic child can be summarized as follows.

**2.1.4.1 The defects of thinking**

- Abstract thinking
- To link and integrate the idea.
- The application of learning from one situation to another situation.
- Creativity and imagination.
- Organized and sequenced.

**2.1.4.2 Impairments in the perception of stimuli.**

- Choosing a specific interest stimuli. Children will be interested stimuli one and ignore other things. Because of perceived signal that others less than normal, the development is slow, social interaction, hard so. Should choose a specific signal with

meaning and not too many, because will make children get confused.

- Too much stimuli. Children with autism are unable to filter stimuli coming along very well be bewildering.
- Focusing on detail. Children will observe details, particularly visual. as well as the noise. In the high IQ children to pay attention to details such as the knowledge memorize phone numbers or the name of the capital of the country, but the problem is that children do not know those details, how important attention to detail, and always choose the wrong path.
- Not concentrated. Children often concentrate on long only what self interest. But what don't care to live only a moment. When things happen at the same time, the child can't concentrate as instead of listening to the teacher but care shirt of teachers.

**2.1.4.3 Behavior associated with learning.** Some behaviors of autistic children may hinder learning.

- Lack of direction or self-guided. If a child left dormant children will not be able to determine on their own what to do.
- Surrender and retreated. When it is difficult to give up. Do not try to make. If not successful, the symptoms will be repeated, such as behavioral regression.
- Don't like change. The learning process of a child with autism often limited with familiar. Don't do a variety of activities, stubborn to changes even a little. Children can be frustrating.
- Lack of initiative and motivation Children with autism look like a lack of motivation or motivation within themselves. Children who are well trained to follow orders well. Or activities of daily living without explanation. If it is not familiar, cannot decide for themselves what to do. And has expressed no interest in the vacant persistent fatigue easily.

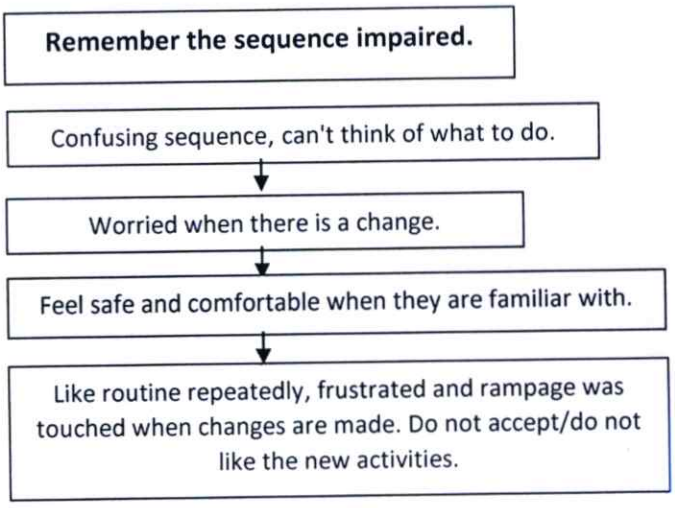



Diagram 2.5 Show cause and effect of the meaning of memory about the sequence

The transition from one activity to another activity. Children with autism do not expect a sudden change in advance. As if triggered by external stimuli rather than intrinsic motivation. Or from its intentions, as was the wasp. If I saw something moving, it gets fixed it immediately. This is probably due to problems in self-control. As well as changing focus from one thing to something. The program appears to be or being motivated by stimuli from the external environment over the intention. (อุมาพร ตรังคสมบัติ 2545. ช่วยลูกออทิสติก หน้า 85-91)

Other problems related to learning disabilities is concerned that too. Especially with the uncertainty in the environment. Impaired language and communication. Make learning difficult. Because children with autism have sensory perception disorders. Causes and retreated too excited. When a child with autism and serious need. Children often have intense cravings. Causes repetitive behaviors and obsessive. And learning to fluctuate ability to learn may change each day. The concentration is not stable (อุมาพร ตรังคสมบัติ 2545. ช่วยลูกออทิสติก หน้า 85-91) อุมาพร ตรังคสมบัติ The summary. Cause and effect of the map image is the behavior as follows.

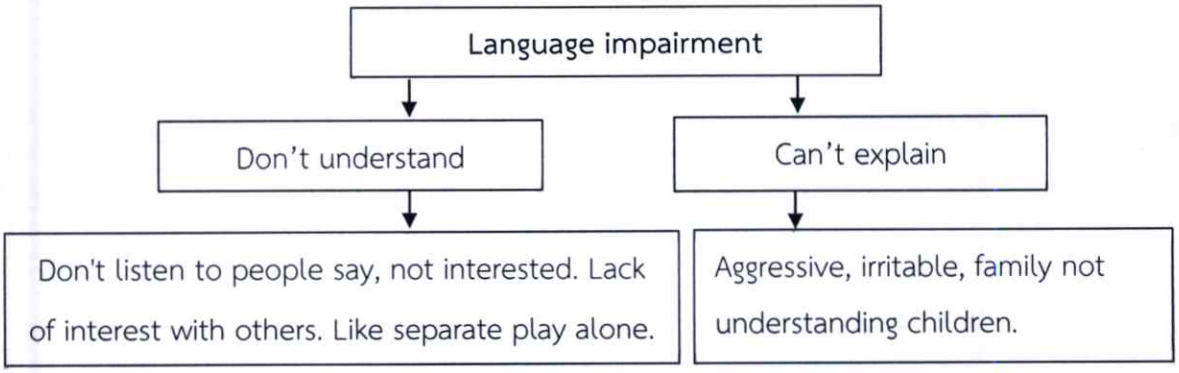



Diagram 2.6 Show cause and effect, language impairments.

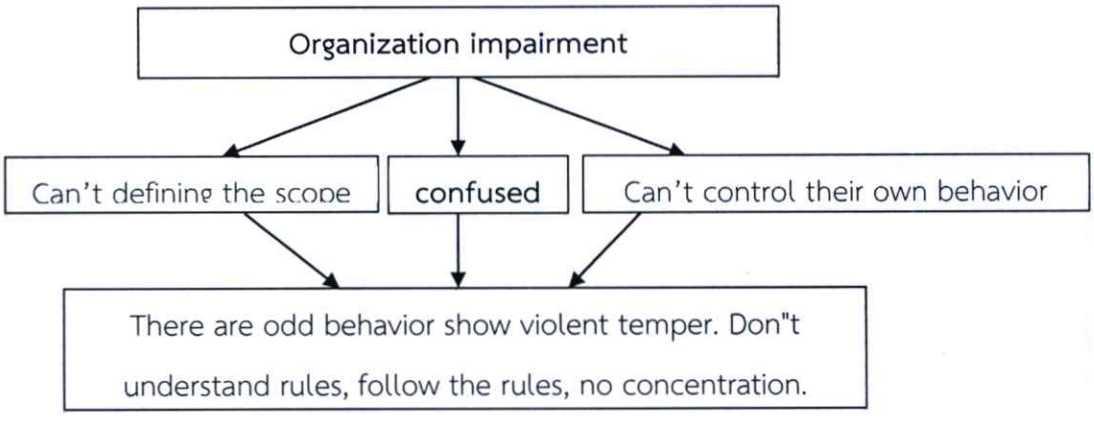



Diagram 2.7 Show cause and effect of defective management.

2.1.5. Behavioral and emotional problems relating to the environment.

Can separate out the bad behavior of children with autism have two parts: a behavior that can be seen and behavior that cannot be seen. (อุมาพร ตรังคสมบัติ 2545. ช่วยลูกออทิสติก 196-197)

2.1.5.1 Behavior that can be seen.

- Repeatedly
- Aggressive
- Separate.
- Worried.

- Ignoring, not interest anyone.
- Sexual inappropriate

2.1.5.2 Behavior that cannot be seen

- Do not understand the rules of society, the rules of play and the competition.
- Do not understand the feelings of other people's thought
- The limits of language
- Sexual desire
- Usually self-control is poor
- Lack of common sense.
- Limited imagination.
- Worry, Feel insecure.
- Cannot applied what they learned to other situations.

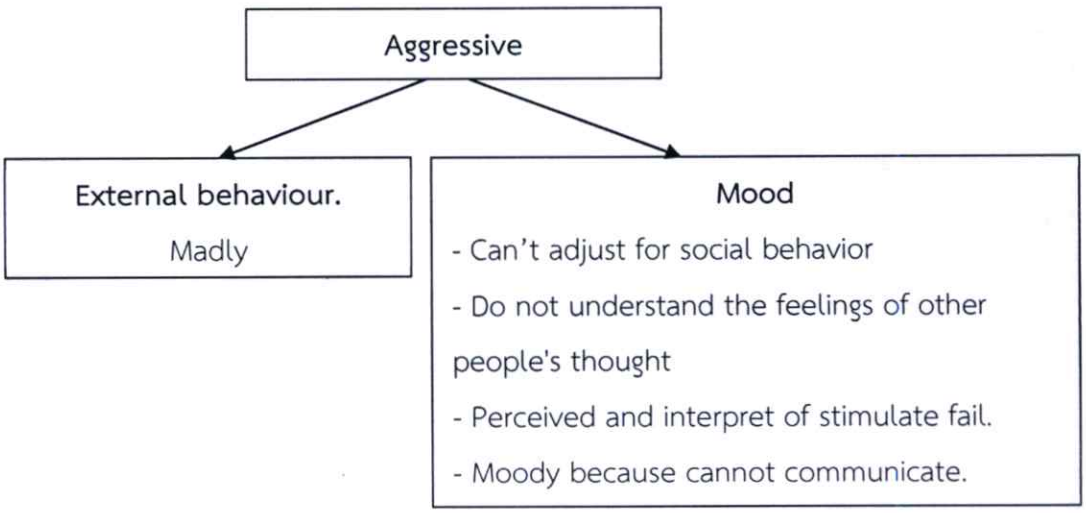



Diagram 2.8 Show aggressive behavior of autistic child.

**Conclusion**

The concept, characteristics of autistic children, it was found that autism mean symptoms that have impaired severely in meaning behavioral, social, and learning disabilities often occur in childhood and know the symptoms of the disease was observed development. Which can be seen in children aged from 3 years old. These

children have problems thinking, intelligence, perception, which as a result, the boy can't learn well. Understanding, there are problems in communication. And enter the society. Which results from impaired brain that causes these problems. In both a baby in the womb during and after childbirth.

Autistic syndrome Disorder symptoms with defects in various due both 10 side, which is considered as the symptoms, with the most of those groups. Autistic Spectrum Disorder together, autistic children have different IQ. But the group with the most is the level IQ between 50-80 arranged in groups a layman. The retarded a little levels were 25-35. **Thus, the sample in this research. A child with autism and Autistic Disorder aged 3 years to 7 years of age and IQ level is determined not determined the cause of the disease. Reason syndrome Autistic Disorder because with disabilities in all aspects. In order to represent a character defect. Among other symptoms, and cannot be determined from the sample IQ and cause of the learning environment for behavior therapy, in fact. A group of children with IQ scores to be shared. So to make the learning environment for modeling can support the work covered in the study group needed to study children with IQ scores range as well.**

**2.2 The development potential of children with autism.**

In a study on the concept of development of children with autism. There are a variety of methods This can be summarized by topic below.

2.2.1 Treatment programs.

2.2.2 Stimulate development

2.2.3 Technical training to prepare children

There is currently no method to cure autism can be cured. Knowledge in the medical field current period. This disease is a disorder of the brain that cannot maintain a "cured" but can be "better" if given the right help from young children.

"Better" means that if you get the right help. Children with autism can learn. Understand the world around and interact with the outside world better by encouraging personal development. Can learn to live with people and live near-normal

behavior, many may be adjusted to better. Symptoms are reduced some children have left, but some children were rescued as well, may not be autism.

"Cured" means some symptoms remain despite growing up. The อาการท that remain, including difficulties in the perception of stimuli around. Gaze and the change of concentration cannot as fast as normal.

Factors determining that autism is improved much is. Intelligence quotient and support proper. If the fair value good arthropod is IQ higher 70 up, the children have the opportunity to develop possible to lower 70 equals the mental retardation associated with an opportunity to understand the world is reduced.

Help right is very important. Help, especially early stimulation as well as close to normal children is the most important. (อุมาพร ตรังคสมบัติ 2545. ช่วยลูกออทิสติก หน้า 55-56)

**2.2.1 Treatment programs.**

Treatments that are currently available can be divided into six groups, including behavioral therapy. Stimulating the brain, language and communication. Muscles and senses the use of drugs or substances. Nutritional therapy Psychotherapy are discussed in detail specific treatments. With respect to the creation of the right environment is behavioral therapy.

**2.2.1.1** Behavioral therapy

Get your child to develop a better and more appropriate behavior. Edit abnormal behavior Using stimulation and behavioral therapy. Based on learning theories include Lovaas and two TEACCH program using behavioral methods such as the training activities in an orderly and clear. In order to learn more easily when children are not confused to reward good behavior , which can reduce problem behavior developed symptoms on me for not ooze. The analysis for the behavioral development in children with autism. Have demonstrated success already. It can help enhance learning. Increase IQ level and developing relationships between students

themselves. This is one of many school systems were tested and taught to develop behavior change, and this has created a pattern of behavior of children with autism up. The teachers, many of whom have studied and found to stop inappropriate behavior ( Garrett Butch "Applied Behavior Analysis Therapy Can Help Teachers Work Better With All Students" )

Lovaas treatment program Home Program is Early Intervention in the way treatment is to train young children, particularly children under 4 years of intensive behavioral analysis is the principle training one-on-one coaching by at home before, so that the child can communicate and have the appropriate social skills. The home environment should be a room or area for teaching, especially.

Programs, TEACCH treatment and Education, the full name is the Treatment of Autistic and related Communication handicapped Children are as follows:

- The classroom is a mess
- a schedule of activities, of course
- there is a clear expectation. Let children know what to do

, how to teach children to see images rather than sound is more than explained. Communicate using symbols Teaching skills to cover all the major aspects. (อุมาพร ตรังคสมบัติ 2545. ช่วยลูกออทิสติก หน้า 72-74)

Examples of conditions referred to in the way of TEACCH. ผดุง อารยะวิญญู 2546 (หน้า 30) The areas in the classroom The area by the

- Photos of children are play toys show that this area used to play group activities.
- The children are attending school. That area is used for classes. The exercises Children are not noisy.

- A child crying. This area shows that the imprisoned children behave inappropriately. The trainer may use color-coded areas such as yellow, green, red, respectively.
- Managed environment. Scope and vision Help children with autism to understand the beginning and end of the area. (Susan Stokes, Structured Teaching: Strategies for Supporting Students with Autism?")

**Ways to teach kids.**

Even children with autism have defects and limitations, but also can stimulate to learn by doing 3 this thing together.

1. The development of skills better, such as thinking skills, imagination and link ideas.

2. The strength or ability to be helpful.

3. Adjusting the appropriate environment for the limitation and the needs of children, such as reducing the distraction in the classroom to help focus better.

When 3 things to happen at the same time. To make learning possible, simple and effective.

**Technical help to learn.**

1. Acceptance of differences and limitations of the child. Children with autism and some less, and so many different skills, each is different. Trainees must try looking for hidden talent and develop better.

2. Teaching like calm down. Take teach slowly, slowly.

3. Arrange a suitable environment. The environment to help children learn most is the environment regulation. If a lack of such children will not be able to process data in to new learning. As said by the detail in the concept of the relationship between autism symptoms and physical environment

4. Orderly environment should be held both at home and at school for learning is continuous.

5. No motive too. The children have appropriate stimuli, it is important to allow learning. The rooms are quiet and orderly enough to teach one by one, method of simple and clear.

6. Select the data or signals with meaning. Many signs that teach may not. So try to select stimuli or signals related to the work that children must learn.

7. Learning from the picture. Or to see better explain the long, so should be used to see. From the pictures, but the details or too much.

8. Help children succeed by providing kids work simple, can make things difficult.

9. Organize make clear, especially a schedule of activities on a daily basis. There is a hierarchy on each.

10. Break to small children to work to help children work done step by step.

11. Encourage children to do the most, by using the signal which is appropriate to the job.

12. Don"t rush the child too much, don"t force because of the reaction against it.

1 3. Teaching the game. Because the child will learn less find two official stressful.

1 4. Follow closely, because children lack the Self-direction should be monitored in child care closely. (อุมาพร ตรังคสมบัติ 2545. ช่วยลูกออทิสติก หน้า 92-96)

**2.2.2** The principle of the development.

The key to stimulate the development and learning as well.

1. Understand the world of the child.
2. Start by making a brave kid approached.
3. Motivation to learn.
4. Stimulate holistic development.
5. Practice development.
6. The appropriate program with the boy.

7. Increase the ability of children. Add skill and reduce the defects of children by adjusting the environment. To prevent the defects that affect learning.

8 . The proper environment and learning environment that regulation is certainty.

9 arrange appropriate stimuli. Children should have a peaceful classroom to help focus to concentrate more easily.

10. Establish rules in practice, children often concentrate bad room orderly will reduce distraction down.

11. Teach what children are interested.

12. Focus on strengths of children.

13. Training plans.

14. Aim at concrete.

15 training basic skills.

16. Learn from real.

17. Learn from the picture.

18. Learn from studying.

19. Practice from easy to difficult.

20. Practice repeatedly.

21. Continuous uniform intensive seriously.

22. The expectation is important.

23. Coordination. (อุมาพร ตรังคสมบัติ 2545. ช่วยลูกออทิสติก หน้า 101-108)

**2.2.3** Technical training to prepare children important training is in preparation

1 . The training facility. The training facility is important. Which enables the training to be effective. As will be discussed in more detail in the relationship between symptoms of autism with the physical environment to

2. Scheduling principles. Children with autism learn better in a well organized. The schedule is one that helps to organize as well. Because to know what will

happen in the future. So do not be confused, and reduce anxiety. This helps prepare children to be ready for new activity. Allows children to work the process eliminates confusion and

3. Training plan

- Targeting

- How to practice and how long it takes. (อุมาพร ตรังคสมบัติ 2545. ช่วยลูกออทิสติก หน้า 111-112)

Training children to concentrate Why Meditation Since most children There is still And distracted If you do not train a child to concentrate. Learning would be impossible. And not being able to do something more difficult than ever. It is difficult, takes longer. You have to concentrate as much as possible.

**2.2.4 Child autism education**

Children with autism learn how high depends on the level of intelligence or IQ scores when children are young. The most important is to learn at home. To learn more. Should arrange to attend school close to home. If young children are typically more severe symptoms. School was fairly common for elementary and middle school. Should be evaluated seriously that the child should remain where classes. And teaching styles may be appropriate, with the most children. General teaching in elementary and secondary schools have 3 type.

1. Special classes.

Children with more symptoms should be a special class But at present, Thailand also no school with classes for special children very much. Special class and most will not separate specific teaching children with autism but teaching included. The mentally retarded children and children with autism.

2. Learn some subjects in conjunction with normal children.

Children learn better together with normal children, some other subjects, but some subjects will be specific groups. The teacher will have to provide special

assistance, where appropriate, is how much the children have the opportunity to learn as well as typical children. At the same time it receives the appropriate assistance with.

3. Normal class all subjects.

Children who have fared relatively well and intelligence might class as normal children. But teachers must be knowledgeable enough about this disease. For some strange behavior from other children. If teachers do not understand the effect that children should have the opportunity to learn alongside normal children. To receive the proper stimulation and mimic the behavior of a normal child. It should be done when the child is ready. In particular, the availability of communications and some children have to be in a special class. The regular classes may not have sufficient regulation and may spur excessive distraction and make it hard to control.

**Learning together with normal children.**

In the project. Trying to autistic children had a chance to study combined with normal children and important project is the project of academic cooperation between constructivists learning with the hospital. Department of mental health, the Ministry of public health. In this project is called the inclusive classroom education management by the autistic child. ADHD and normal children learn together a regular classroom in primary years 1-2 autistic children to learn separately in the project of special education. And the class, including only a few subjects.

From the observation of teachers students in the project. Found that students with autism often living alone, no concentration, etc. these problems will be refer to how to learn for children properly.

How to learn for children with the issues involved with the environment. The teacher should take into consideration in teaching is the teacher must not forget that visual stimuli. Or the sound in the normal level for general may be too much for autism, such as audio, light bulbs of Fu Auto Race St. Or car running the streets may make children distracted as much, so the seats, and suitable to save children distracted as sit far away from the window or sit in front of the room near the Around the teacher.

Children often have problems in the data system. We should help the child to organize better by only setting the table, pack, or schedules. (อุมาพร ตรังคสมบัติ 2545. ช่วยลูกออทิสติก หน้า 228-234)

Summary

A study of the development of children with autism. The researchers note the principles and how to improve. Which essentially behavioral therapy To achieve proper By the way, is widely popular. Lovaas treatment programs popular with young children. The environment practice at home to prepare. TEACCH program and treatment program is available to all ages. The program is taught in the classroom. Teaching is a mess. By focusing on the training program, coupled with the environmental regulations that are taught. Because we believe that the right environment can help children learn best. In the absence of such an environment, children will not be able to process data in a way that will have to learn a new

Thus, the sample is treated using a combination of both. Used as a tool to carry out research on the part of the activities taking place under conditions of a special education classroom. To observers Behavior of the training environment, and because of that sample. Children with autism aged 3 years and up who love to train under a special education school. Such applications are particularly suitable.

## 2.3 The concept of the relationship between the physical environment to the symptoms of children with autism.

### 2.3.1 The importance of the environment with symptoms of autism.

The environment is good or bad planning and the environment in a child's life. It is very important for the long term. (Skeels.1966 referenced William C. Rhodes) The Bloom has indicated that the environment create our ability to have a variety of different the change of environment is important very much. On the personality

characteristics of human rapidly. (BLOOM, BENJAMIN S.1964 referenced William C. Rhodes) The environment that appears in a class different from that used to be. The disturbance is different. Which has little interference while working independently sit together And will disturb more when doing activities with teachers. And activities that are using the device assembly. The relationship between teachers and children to be variations. Depending on the child and environmental factors. However, the relationship will change according to the teaching style. (Maureen A. Conroy, Jennifer M. Asmus, Brian A. Boyd, Crystal N. Ladwig and Jennifer A. Sellers.2007) Difference of environmental factors of the classroom to make children's behavior in different levels. (Conroy et al., 2004; Haring & Kennedy.1990)

The environment is built. The conditions and factors important. The influence of direct and indirect per person who is impaired, as the architect John Jenkins has confirmed that the design is associated with people of all ages and in the buildings of all types. By referring to the design of space for children education is Otis locating The main and most autistic children should be able to cope with the design space around them. And that is important in the field of architecture. To consider the impact on the residents, especially those with symptoms of internal organs. To understand the symptoms by Otis locating So they can recognize the area environment. And as a result the development of in them. Because they have specific requirements and to prevent difficulties in live under such an environment. (Scott, I. 2009 referenced Pilar Arnaiz Sánchez)

Creating a physical environment interaction. For children with autism develop social interaction. And at the same time It can cause problems, too. (Pilar Arnaiz Sánchez) This unique characteristic defects of children with autism will determine the demand for physical environments are different. (Bradley, Robert H.et. al.) The physical environment is part of the therapy as a tool. (Margaret H. Amanda, "How Autism Treatments Can Help Your Child Cope")

**From the data above suggest that. Environmental factors have a tremendous impact on the development of children with autism have. In this study was to**

**characterize the physical environmental factors. Symptoms associated with each of the children with autism to follow:**

**2.3.2 The relationship between environmental factors on the characteristics of each type of treatment.**

1. Defects in administrative command.

Specific manifestations of children with autism brain lack the ability to command management, planning, decision making, coordination of behavior control according to the procedure is very difficult. Confuse towards the sequencing process. The child a cold! It can't imagine what to do the next stage. (อุมาพร ตรังคสมบัติ 2545.)

As such, the researchers conducted a search for environmental factors that are linked to the physical characteristics of children with autism. So that children with autism can. And understand the sequence of events management Decisions and control their own behavior, the activities that take place each day easier. With a guided environment the following factors:

To organize space by space and cut down some area classification by areas within the classroom into the sequence. (Mostafa.2008 referenced Pilar Arnaiz Sánchez ) Space division is a subsidiary use type in each activity and the use of a ไปตามลำดับ activities will help children to recognize the environment. To plan and decided that the area where the activity is the sequence. Do not conflict in the area. And also said, including requiring use Visual Environment in the ranking step of activities. By communicating with a clear picture To signal indicative of sight Includes color meaning only to tell with the number, and the use of various symbols together up a schedule of activities (Khare, R. & Mullick, A. 2008 referenced Pilar Arnaiz Sánchez) All the above information which is consistent with a TEACCH treatment program that specifies whether to use the image more resembles sound. Communication by using an image or symbol that is not too much detail and scheduled according to the sequence of steps for each of the activities that must be done explicitly. (อุมาพร ตรังคสมบัติ 2545.) (Susan Stokes, Structured Teaching: Strategies for Supporting Students with Autism?" referenced ผดุง อารยะวิญญู 2546) The meaning of the sequence of activities with the

use of symbols with meaning clear and simple is the help autistic children"s planning and decided that any activity to activity. Which factor symbol design such may be represented by colors, numbers and symbols contain a schedule of activities to a separate sequence is seen clearly. The use of symbols in the area in the classroom. By way of figure shows the usage of the area. Such as the children"s toys in the living area. Shows that children can be noisy. The children"s school. So this area used for learning exercises child loud didn"t figure children are crying. That is used as a detention children demonstrated inappropriate behavior. May color directed the area with such as yellow, green, red, respectively. (Susan Stokes, Structured Teaching: Strategies for Supporting Students with Autism?" referenced ผดุง อารยะวิญญู 2546.) The image shows the characteristics of the area is clear that the area was used for anything. Children will be able to decide what they should behave in that area. To comply with the purpose of use in the area. The purpose of the activity and therapy which foster efficiency in the treatment of children with autism have to reference all of the above. Researchers concluded environmental factors. Symptoms associated with these impairments are as follows: Management space in order to access it. The use of visual symbols to determine the sequence of events.

2. Impairments in processing social information.

Children with autism are behavioral isolation. And lack of social skills because the brain cannot distinguish between social stimuli. With another stimulus when there are so many children are confused, like Maverick alone. The nature of the design of classrooms of children with autism to enhance the social aspects that must be considered. Relationships within the classroom. The physical characteristics of the area Equipment material events occur. Of people in the room And a matter of time (Sally J. Rogers, Jean M. Herbison, Hal C. Lewis, Jeanne Pantone and Kathy Reis) The relationship between the The physical environment in space Events that occur are related to the design of the classroom to promote the potential of children with autism society. Because these things are elements of the social interaction and are unconnected. As an incentive to each other. In this consideration Nature activities happening Functions and role of entrepreneurial activity. And duration of the activity.

In order to be a factor to consider. Together with the physical environment within the classroom. As the relationship between the characteristics of the physical environment of the classroom with the social behavior of students during the event. In order to gather appropriate and inappropriate behavior of children with autism to use in further research.

Study the classroom environment. Behavior and segregation of students with autism has divided the classroom under conditions that are actually four issues, namely 1) the teaching 2) teaching activities 3) materials used 4) Proximity and away from children (Maureen A. Conroy, Jennifer M. Asmus, Brian A. Boyd, Crystal N. Ladwig and Jennifer A. Sellers.2007) Consideration about the physical characteristics of the classroom. Considerations about social distance. In the interaction between students and teacher. (Schwebel.1969)

Because children with autism have a habit of secession. Because you can not distinguish the difference between what we had then. Consider the distance to demonstrate the importance of the separation behavior. And lack of social skills Because the distance between students and teachers. Isolation is a factor to control the behavior of the child's behavior to be appropriate. The teacher, who is controlling the interaction that takes place with the children to concentrate on the teacher's control by not paying attention to other stimuli around too much. Such arrangements provide a space for social interaction helps to reduce child behavior secession. The cause of social interaction between the children themselves and to create a space that is private. (Humphreys.2008 referenced Pilar Arnaiz Sánchez) The space for social interaction should be a space for group activities. In the style of play Working Group and creating privacy is preparing to apply for a single event activity with a teacher. This helps to identify other conditions that occur during the event easier and encourage activities can be carried out continuously contribute effectively to the development of the society of children with autism. That is appropriate Also consider position in an environment that is associated with behavior, social interaction, such as a seat in the classroom allows interaction. And effectiveness with students By considering Characteristics of children For example, some people are still not available.

(Hyperactive) or even walking. Children may need to sit in a corner, then took a widely held. So the child out of the seat more difficult. (อุมาพร ตรังคสมบัติ 2545.) To provide a child seat in the rear Teachers sit outside to prevent the child seat (ผดุง อารยะวิญญู 2546.) And found that most teachers will sit in a position to control the class. The environmental factors related to seat between teachers and students. A teacher can help control the child's behavior in a proper interaction during the event grew out of the proper position to make children interested in provocation prepared teachers. Not to be confused children in other stimuli. That would interfere with activities this will foster social interaction with teachers better.

So in consideration of the environment that are related to the unique nature of the symptoms associated with a deficiency in processing information society of children with autism. That consider environmental factors, physical side. Seat between teachers and students and the seat of the students in the classroom. The distance between the teacher and student the support area for group activities and individual activities. The factors causing these contracts have assumed that they can promote the potential of children with autism in the field. Social information processing this must be considered in conjunction with Nature activities happening Functions and role of entrepreneurial activity. And the timing of events within that environment.

3. Impairments in processing sensory information. The perception of stimuli and learning disabilities.

Children with autism have impairments in integrating sensory information received. There is a perception that confusion Sensitive to sound waves and stimuli around them are too afraid of loud noises, and sensory perception disorders. This may be a touch-sensitive. Too much or too little Cause retreated frightened and excited mood. (อุมาพร ตรังคสมบัติ 2545.หน้า 20-22)

Children who have difficulties to recognize stimuli. Can distribution problems to recognize stimuli as follows.

There is a selection of some interesting stimuli. Child care will be one of the stimuli. And ignore the other things I recognize the signs. The others were sent less

than normal. Development is slow Social interaction difficulties Too much stimulation in the presence of children with autism are unable to filter stimuli coming along very well, which makes children become confused. Children will be focusing too much detail. It noted in particular the fine detail picture. As well as the noise, but the problem is that children do not know those details, how important attention to detail, and always choose the wrong distraction. Not concentrate Children often concentrate only for what they do. But what is interesting is not just a moment. But what happens when multiple stimuli simultaneously. Children are not concentrated stress disorder ADHD is unstable and susceptible to slip-K sound. Sensitive to things around Anxiety with change Recognition confusion Confusing and stressful things on us. Loudly

When considering such restrictions. In terms of design for the environment by reducing the aforementioned issues. Researchers have found that the reference design, the physical environment for children with autism that can be associated with symptoms such as children with autism, severe mood swings. The environment should be allocated space. Barrier for reducing undesirable behaviors (retreat box) to create a calm, private to children. (Beaver, C. 2010 and Ian Scott 2009 and Richer, J. M. & Nicoll, S. 1971) and (Khare, R. & Mullick, A. 2008 and Vogel. 2008 referenced Pilar Arnaiz Sánchez) Creating peace is vital for the child's emotional and behavioral adjustment of children to return to normal levels in order to be able to get back into therapy. The preparation for the control of undesirable behavior is what the classroom should prepare.

Should provide a flexible space that can be adjusted according to the type and activity. The use of space for both small and large. To the nature of activities that took place. The Learning and Skills will be there in person. And classes in small groups It must be adapted to suit the characteristics of children with autism disorders. The autistic children she will learn best in an environment that provides a break out area. (Lorna Wing,2527 referenced วัลลภัตม์ โคตะนันท์ 2546),(Beaver, C. 2010 and Ian Scott 2009 and Richer, J. M. & Nicoll, S. 1971) and (Khare, R. & Mullick, A. 2008 and Vogel. 2008 referenced Pilar Arnaiz Sánchez)

The design of the physical environment with absolute clarity. Because children with autism have a habit of escaping society. For example Walking away from the others retreated to the other vacant. Therefore, the design should include the composition and structure of the environment, frankly, there is still a stable, secure and simple to create the environment to the extent of recognition in the area. And provide a range of vision. Help children with autism. Understand the beginning And the end of Space To be clear, (Susan Stokes, Structured Teaching: Strategies for Supporting Students with Autism?" referenced ผดุง อารยะวิญญู 2546.) Environment should be provided on a predictable nature of space. That way, any way physically. Which contributes to the satisfaction of social interaction. And direct actions in the framework of the activities of each activity that can have both a sense of independence as well. (Ian Scott 2009 และ Humphreys.2008 and Richer, J. M. & Nicoll, S. 1971 and Khare, R. & Mullick, A. 2008 and Vogel. 2008 referenced Pilar Arnaiz Sánchez)( Johnson, Maeetta B.) and (อุมาพร ตรังคสมบัติ 2545.) The design of physical structure by holding a Visual Environment clear can help children to continue the event. Which can be communicated to children with Autism Awareness to safety in the area. And the preparation of the area to meet the needs of social interaction at close. (Ian Scott. 2009 and Khare, R. & Mullick, A. 2008 referenced Pilar Arnaiz Sánchez) The environment mentioned above is consistent with the treatment TEACCH is taught in the classroom. The key is the classroom is organized means to have a course map. Clarity and predictability with fewer elements to reduce distraction. The children concentrate more. And the new learning continuously. (อุมาพร ตรังคสมบัติ 2545. ช่วยลูกออทิสติก) In contrast to the chaotic environment. Equipment used is not clear, there is no deadline for making a child's confusion. Regulation in opercula is a good environment is important to help autistic children manage with the environment more easily. Response to the surroundings better, feel safe. (Susan Stokes, Structured Teaching: Strategies for Supporting Students with Autism?" referenced ผดุง อารยะวิญญู 2546.) Factors for designing an environment that conveys a sense of space. Unpredictable nature of the use of space. Can be achieved by manipulating the physical environment, the nature of the perceived boundaries of the area. The scope of vision To make the

children understand the area and its use in the area, which can reduce anxiety. Reduce feelings of insecurity Stability and planning. Control myself better.

Preparation area on these issues to achieve compliance with the activities taking place. Children with autism can focus on activities such as site preparation, contributing to the activity. Will help to control the stimuli that do not relate to activities which would disturb occupational therapy for children with autism.

Wherein the size of classrooms of children with autism are involved with processing sensory information and perceptual stimuli defect. There are those who mention this point it broadly follows the classrooms are too small can cause congestion. Affect the behavior of children Classrooms that are too may make children feel confused. I do not know how to engage in some activity (ผดุง อารยะวิญญู 2546.) Area-based activities should be wide enough for a child to adjust their behavior accordingly. The benefits of training are different. (Beaver, C. 2010 and Ian Scott 2009 and Richer, J. M. & Nicoll, S. 1971) Rooms are comfortable Wide enough, not crowded (อุมาพร ตรังคสมบัติ 2545.) Based on that data signals can be assumed that the size of the classroom. And the size of the space activities Affect the perception of stimuli that affect children's behavior. And indicated that the size of the space is appropriate. Are consistent with the behavior of the child in therapy. So if you consider the size of the area of activity that need to be considered in conjunction with the behavior. And training activities that take place within the area.

**Designed to reduce stimulus in a key issue in the hearing. As in the training of children should be a unique signal that is meaningful and not too many because it's confusing.** (อุมาพร ตรังคสมบัติ 2545.) Therefore, the use of stimuli it should only use stimuli associated with training by other stimuli not influence children, which may be confusing. When there are other stimuli that do not fall within the relevant area, while the Union is. That means considering the variables, select use device specific activities related to the activity. The number of components the activity and visibility to other devices that are not related to training. To minimize interruption and should minimize stimuli into smaller areas to reduce the number of stimuli and

avoid social interaction that is excessive. Which design should provide an area where children can live peacefully is an area that is a mess. There is a play area, such as the preparation to climb the roller skid so that children have time to play as an independent when they want. (Richer, J. M. & Nicoll, S. 1971 referenced Pilar Arnaiz Sánchez) (อุมาพร ตรังคสมบัติ 2545.) Another is to reduce stimulus. Designing a classroom disturbance from others as little as possible. And not make them feel threatened. Environment should not contain elements that invite to see or hear of touch. That bothers the kids distracting than anything prepared for practice in the classroom. Otherwise, concentration deficiency symptoms are more problems to be studied not. (Richer, J. M. & Nicoll, S. 1971 และ Vogel. 2008 referenced Pilar Arnaiz Sánchez) (ผดุง อารยะวิญญู 2546.) As the information above the reduction of stimuli within the environment of the classroom. Should consider stimuli in different are as follows: stimuli arising from social interactions with too much. Health threats from other people, and can see, hear, feel irrelevant stimuli with practice due to the disturbing training activities. Reducing social interaction with too much can then be handled by staging area for a suitable activity to prevent the intrusion of other activities to disturb in the activity in that area. , without need to control visual stimuli should consider using the mirror looking outside, to minimize interference in sight. (Beaver, C. 2010 referenced Pilar Arnaiz Sánchez) Or using a simple wall to avoid interference from other stimuli. (Susan Stokes, Structured Teaching: Strategies for Supporting Students with Autism?" referenced ผดุง อารยะวิญญู 2546) Or to separate teaching, especially if you can use the practice facilities provided by a veil covering it. Do not close the door and train kids it will easily distracted children (อุมาพร ตรังคสมบัติ 2545.) Considering environmental factors in autism classrooms where children study together with normal children. Consider the visual stimuli. Or sounds in normal children, but may be too much for autism, such as voice full of fluorescent bulbs. Or cars running on the roads could get very distracted child. So be seating for children with autism. Not suitable for children as a distraction from the window or sitting near the front of the room, the teacher.

Classroom environment that is too wide to make children with autism want to walk out of the room. The windows are too distracting to children because children with autism are often looking out of the window should be closed down. Adjacent classrooms and classrooms near the corridor. Make noise into the room. (ผดุง อารยะวิญญู 2546.หน้า 34) Consider using acoustic material, it is important to control stimuli because children with autism have impaired to distinguish sounds. And susceptible to noise than the general perception. In designing the classroom for children with autism must take into account noise control with the use of materials, structures and systems that help to absorb sound. (Beaver, C. 2010 และ Ian Scott. 2009 และ Humphreys.2008 อ้างถึงใน Pilar Arnaiz Sánchez) Furniture factors that are associated with the occurrence of the sound stimuli, it is an issue that is vital to the development of children with autism as well as in Switzerland, left Switzerland. The ball used for physiotherapy students to take a course to help them learn better. Reduced monotony Make children more interested in class activities. Noise reduction because children can hyper rocking chair without having to move the chair. Make classroom calming down (McBride, 1993, อ้างถึงใน Denise Lynn Schilling and Ilene S. Schwartz.2004) And provide chairs, desk comfortable seating fit for child. (อุมาพร ตรังคสมบัติ 2545. หน้า 121-123) Therefore, the appropriate furnishings dealt with the characteristics of the children in that this is the autistic consider furniture that can solve the problems of inappropriate behavior that will interfere with others. Example, the sound is caused by the use of furniture.

Physical environment factors regardless of the occurrence of Visual stimuli, and the design of the physical environment will reduce the Visual disturbance factor positions, practice areas, consider the. The distance between the doors to the training area. A window and the ability to see the external environment from the opening of the classroom. The number of such factors, the doors it was born from a single new openings that children can see autistic external stimuli and internal stimuli to influence your children to concentrate in school while autistic learning inside the classroom and if can. Control of the quantity to see stimuli that are not required of children section, it will be the autistic clicks help children decrease symptoms and autistic press ahead so concentrate more in school, both factors contributing to environment, noise, it is

the part that makes your child's concentration reduce, that the physical environment factors contributing to causing interference – in that space. Based on the position of other classrooms that are near each other. The distance of the classroom because of two things: this is an external audio source that can interfere with learning space within the room, including the consideration of children and the characteristics of materials used in environments that have a sound absorbing properties or not.

Considerations for materials and tools used to teach hand teachers. The reach can be picked without walking to pick up, because if the teacher walks away from the child to the. Children will distract to something else and will make your child's attention, teachers return to work activities is difficult. (ผดุง อารยะวิญญู 2546.หน้า 101-108) Activities and equipment should be provided. On a shelf or in a cabinet so children will not be confused. And to learn to pick their own. (อุมาพร ตรังคสมบัติ 2545. หน้า 121-123) and (Kat Houghton "How to create an Optimal Leaning Environment for your Child with Autism" ) The factors of learning equipment that is related to the position of the storage device within the near that teachers can pick up conveniently and in a position where the child can recognize anywhere. If the sequence of activities that require equipment, children will be able to know to pick up that piece of equipment.

The electrical stimulation caused by the presence of a specific data point as the electrical environment within the classroom of children with autism should not have to turn on the TV. Radio noise or open at all times or, if possible, within the environment of children with autism. Toys should not have the power machine. And promote the development of social interaction. (Kat Houghton "How to create an Optimal Leaning Environment for your Child with Autism" ) Therefore, considering the stimulus within the region resulting from the use of electrical appliances that should determine the type of electricity that is used for any kind of blue. The purpose of the order Teaching or If it is used for teaching, it will look to use is. Due to the type of electricity used in the classroom to influence the behavior of children with autism while studying in the classroom. And affect the development of society, because children are more interested in electric interaction with humans.

The decoration inside the classroom environment is a factor that should be considered in the design of classroom for children with autism who is impaired in processing sensory information and perceived as a failure as well, which should be used as design details and materials that a fit, creates a simplicity. (Ian Scott. 2009 และ Humphreys.2008 referanced by Pilar Arnaiz Sánchez) The walls should be smooth None of hanging Or a cartoon stick Except for the image to be taught. (อุมาพร ตรังคสมบัติ 2545.หน้า 111-112)

Due to the use of the details in the decoration environment for learning in particular. To avoid creating unnecessary stimuli to the autistic child. So the decoration environment of this research was to consider the materials and equipment for learning that appear to be decorated in an environment that is appropriate or not. Considering the characteristics of the picture or symbol used in the decoration that is consistent for learning?

Stimuli that appear in the form of light within the classroom. A part on autistic children as the following information. The light used in the classroom should be used Dimmers illumination of the light, and allow the control room. Adjustable illumination as needed. (Beaver, C. 2010 และ Richer, J. M. & Nicoll, S. 1971 อ้างถึงใน Pilar Arnaiz Sánchez) Should the use of natural lighting in the room. The placement of the window. And using a light box to allow the distribution of natural lighting to the space. (Humphreys.2008 อ้างถึงใน Pilar Arnaiz Sánchez) Considering the occurrence of glare or bright light that there may be too many shadows and coming into the classroom that will cause the pattern or rhythm of light and shadow from which will cause a natural stimuli in the area.

The use of artificial light in the room, consider installing light bulbs. By using the lights should be selected.

Indirect illumination so you don't see a light bulb and Fluorescent tube, use caution because Fluorescent flicker is not that there is too much stimulation. (Kat Houghton "How to create an Optimal Leaning Environment for your Child with Autism" ) Because children with autism are sensitive to flashing lights Fluorescent (Beaver, C.

2010 อ้างถึงใน Pilar Arnaiz Sánchez) The annual report of the working group in Sunfield School explained that the light from the full fair Fluorescent lights cause glare caused by reflected light, such as the ability to hinder the work of children. The report indicated that within the classroom with the use of light bulbs Fluorescent Full Ortega. They found that children who got off light Fluorescent Essen on stress, anxious or tired, and the other children would have flicked a finger worsened as the Working Group on the table in low light. Full Ortega Fluorescent the children all chose to spend most of the area with natural light from the window over the area with a full lighting Fluorescent. And the committee is of the opinion that further. When the lamp is Daylight no children, then got up off the light again. (staff at Sunfield School.2007)

In the good design must ensure that In the classroom of children with autism using a light bulb Incandescent not Fluorescent factors in the selection of lighting in the classroom for children with autism. Considering the source of light. As light from natural or artificial light. Due to the above information has shown that children with autism have the satisfaction of natural light from the light bulb than full auto race St. Because the light from light full auto race St. stimulus to make children aware of the flashing light and noise from the bulb easily. And also cause glare glare, as cause children distracted. The child was born and dramatic symptoms only worse. The use of natural light, consider the movement of light from the outside to the requirement in the classroom. Because the natural light can make light. Shadows in the area and classrooms. Therefore, we should control the light to prevent the phenomenon of natural light into the glare inside the room. The factors that should be considered. The lighting control of nature. By the indicators from the choice of materials to control natural lighting are used as curtain, etc., and also the research discussed the use of artificial light in the classroom for children with autism, which suggest that Bulb type should be used warm filling. The band knife fixture lighting Indirect. And should be adjustable to illumination. In order to meet the needs of using light as activities happened. By adjusting the luminance level is based on the consideration of caregivers who walked room or the activities inside the room. So this issue should consider the

factors of type lamp along with the type of lamps. The use and the ability to adjust the illumination of the lamp.

So in considering environmental factors that are related to the impaired children with autism related to control stimuli. In order to create the environment.

**1) Impairment of the order processing**

- Access area sequence

- Using symbols in the events sequence

**2) Impairment in processing social information**

Physical environment factor

- Average area of activity within the environment per child.

- Flexibility of the physical environment.

Interaction factor

- Seat position between teachers and students.

- Distance between the seats of teachers and students

**3) Information processing sensory stimuli, perceptions, and learning disabilities**

impairment of sight sensory

- Complexity levels of decorating pictures.
- Mobile hanging or the decoration.
- The distances between the seats and the windows.
- The distances between the seats and the doors.
- Sizes of the openings at the eye level.
- The proportions of openings and the room sizes.
- View seen through the openings.
- Distances between the activity areas and shelf.
- Area partition.

Impairment of sound sensory

- Distance between each classroom.
- Gap between classrooms
- Characterize of the circulation outside.
- Using audio in the classroom

Summary

From the literature review, the researchers are aware of the relationship between consciousness, Assistant General Counsel, athi Ah going physical environment around children all living environment at home and the environment that are required to preserve the environment, which can cause the behavior that is appropriate and not appropriate.

Assuming that the environment is part of the treatment. Serve as a research tool by bringing environmental concept that is unique in the treatment. Variable is related to the physical environment, the following.

## 2.4 The special education.

### 2.4.1 The importance of special education for child autistic

Special education generally means education for individuals, 3 group is a person with disabilities and disadvantaged people the person offering intelligence. In Thailand the country manage to study all three such groups, but most people also have a knowledge and understanding of both parties, this limited group 3 basic facts about a person, then all 3 groups, each group has specific characteristics which must receive special education as a short Special Education Ministry has classified disabilities or impairments to manage education in accordance with the special needs and potential of persons with disabilities. Result in the development of a true 9 categories as follows:

- Who are visually impaired.
- Who are hearing impaired.

- Intellectual disabilities.
- A person with a physical disability or health.
- Learning disabilities.
- Impaired speech and language.
- Behavioral or emotional problems.
- Autism.
- Multiple disabilities.

To conclude, it refers to people who cannot take care of themselves in whole or in part, the need for living a normal life in society. The effect of intellectual or mental disabilities, whether congenital or not. (กระทรวงศึกษาธิการ, 2546:2)

Education for children with disabilities or people in 2484, organized by the school in the form of disability. The Ministry of Education has developed a model Education for this group. To fit the special needs and economic conditions of the country. Current management education for people with disabilities in operation in many forms. The special education the term early intervention services help prepare children with disabilities of all types. To forward it to the school or the appropriate services to children. The outreach Services and other assistance to supplement classroom teaching special education. The management style of education at the top of synthesis. Classroom parallel with autism because they found it. Autism seems to have great potential available to management education differently. From autism potential low or high potential that has not been stimulated development, and also found that children with abnormalities in the structure and function of the brain or central nervous system. Different from the usual average. It also needs to be managed differently from the educational system to normal as well. Making it possible to design synthetic Classroom teaching special education Children with Autism this differs from. Alongside regular classroom ratio of students to staff teachers. Curriculum and Instruction to take specific courses.

Element

1. places a classroom teaching, special education, there must be a specific example places a classroom located in the same building or environment to the classroom of students in the same age range level, potential, high school students and other target groups so that students can be connected to a system of natural and normal students.

2. The personnel shift related personnel team managing the classroom teaching special education must contain.

2.1 Personnel director classroom teaching, teachers, education, teachers, executives, personnel from team special school will be a mechanism to connect your classroom management system.

2.2 Auxiliary personnel, teachers, which must be a material group teams only. Teaching and learning activities for students as possible autistic. Have a homeroom teacher classroom ratio must be in high potential students 3-5 people.

2.3 The personnel, teachers, together with regular personnel, student teachers, but add the homeroom teacher classroom personnel. Course instructors, teachers, personnel, etc.

3. Student target group autistic target group students in classroom teaching education special is 5 people per room, or must not exceed 10 people.

4. Management processes will need to contain the following process.

4.1 The process prepare a place to be used as classroom teaching phiset education.

4.2 The process of individual course [only reinforced the need to teach the strand]

4.3 Personal curriculum management procedures.

4.4 The individual education plan.

4.5 process individual teaching plan

4.6 The measurement process evaluation and quality assurance.

4.7 establishment and training process of cultivating related personnel. Personnel, especially teachers.

4.8 Placement process, System 3, system, as follows:

4.8.1 Connecting system. Connection activity, teaching and learning of the classroom teaching with phiset education, teaching or school events calendar throughout the year.

4.8.2 The transit system can forward high autistic potential student and his friends go to school or do regular activities with the students.

4.8.3 system transfer transferring high potential student and his friends at the level of academic potential and potential behavioral learning can be combined with regular students are.

5. Teaching and learning activities in the classroom educational activities must be integrated phiset. Remove physical therapy activities with the activities of medical education classes together and then connect to the teaching activities of the students normally associated with "leaves" that team personnel, instructors, classroom, Belgian autistic person must be made. In the process of transit "system" and "transfer". Students learn to combine high potential or activities with the students in the future.

All these characteristics include help center initially. To prepare the autistic child. To pass to the school or facility suitable for the children in the country there are many places. And many styles depending on the nature of management and agency responsible. In this research, has selected a place or agencies that provide services to aid in the teaching to develop the potential of autistic children can enter the society and education system to normal in the future. All of which have 2 in

Bangkok, including foundation of light field Tan Special education center, the central area, the characteristic of operation within the agency. The details here.

### 2.4.2 Institute Saeng Sawang Foundation

850/34 Sukhumvit 71 North Khlongton Wathana Bangkok 10110

Founded as a project manager in the special classes for children1979 are allowed to be registered in the Institute Saeng Sawang Foundation 1985 By Professor Dr. Sem phring Puangkeawglass. Chairman of the Board of Directors Institute Saeng Sawang Foundation.

**History**

The institution started Saeng Sawang Foundation since 2522 (Holt) United with the Lord regretted the Foundation, which operates about children and family welfare campaigns, the development of the newborn, according to the hospital then. One part is the children with special problems. These kids won't be able to get the usual way, developmental. At the same time, it has a number of parents have special kids ' ball is having trouble finding the child raising and education for a child, therefore (Holt), so the Lord regretted the United Foundation and parents teach children are grouped together in a special manner, the play group. Start with the first five-person student interests at home, Catherine brand down Orchard later expanded as a trial project to teach special children. Under the supervision of the United Foundation and the Lord regretted moved to Christ Church, operated at no. 11 convent road, Bangkok, which is a project for children with disabilities of all types, are the first in the country in the year 2528 Thailand until approved by the Ministry of Interior, the Moose is open for business. As a legal entity by using the named "The Institute Saeng Sawang Foundation " later literature professor Dara Corporate Vice Chairman, which is a conservation foundation have kindly loaned for a period of 30 years, land use, to be used as a building made of light since the year 2535 Institute Foundation until now.

**The concept of operations.**

1. Special children everyone has the right to receive education. To encourage the highest development potential, known. Self-reliance is free. And have the feeling that self is a person worthy person in the society.

2. Each child is different. Practice training is an individualized education program

(Individual Education Program - IEP) which expert teachers and personnel from several agencies. Several major work together. To seek the most appropriate way to child development.

3. Encourage parents and family role, duty, responsibility in child rearing actively, Appropriate for parents to pay attention to appreciate to you is special, as well as the ball consciousness.

4. Expert teachers and personnel should come from multiple units working together in planning branch. Proper education in child development.

The scope of operation.

1. Service test of children before school individually. To consider the education

appropriate.

2. The individualized education program for children with impaired body wisdom. And the heart such as the child down (Down "s Syndrome) and genetic disorders. Other developmental delay, impaired movement, autism, attention deficit hyperactivity disorder, impaired learn specific areas, as well as disability overlap.

3. Providing special treatment, such as speaking. Physical therapy, music therapy and movement activities. Teaching resource to prepare before the class.

4. Arrange for parents in counseling guidance. And providing the knowledge about training raise special children.

5. Training the teachers of special education. Support research teaching, teaching materials and services.

6. Work in tandem with doctors and personnel in the various departments. Relating to the special children.

7. Education view and practice of university students and personnel involved.

### 2.4.3 Special education center, Bangkok

4645 Din Deang R. Bangkok, 10400

Was established on September 23 2539 to rehabilitation center guests in education and prepare. For preschool children throughout the duty guidance counselling, information study, diagnose disability and academic services. The field of special education, media facilities. Old school special education and related agencies. Management of special education in Bangkok and 3 education area. The development policy of the education quality of the government and the Ministry of education to educational management's equality; opportunity and qualitative. To accommodate the physical disability rehabilitation act of 2534 and the assistance of early solder joint learning task, the network. As well as rehabilitation for disabled various types to present to potential development disabilities to be able to help themselves and coexist with other people. In society, happily.

**Summary**

Special education. An educational model for a group of individuals with unique or special meaning above. Children with autism were divided into one of the defects that punishments were classified according to education educational management in accordance with the special needs Education for the handicapped. There are many forms can be divided into special education center, special education school, school learning disability specific joint education for persons with disabilities. And so on.

Special education center is the center to support the development of various with autistic children in stage one. To prepare children prior to study real with normal children. Which are consistent with the samples in the research. The researcher selected 2 environment of them. To represent in a comparative study of the environment.

## 2.5 A study of involving people with autism methodology

### 2.5.1 Methodology

The test design in the environment is the behavioral therapy in the main event of the observation. By using several methods for instance it can be implemented as a real situation. The test design will be define into three methods: 1) Teaching as normally without controlled or simulation 2) Teacher will be lead all teaching activity 3) Teachers will lead to communicate in order to stimulate classroom activity (Jennifer B. Ganz. Et al. 2011).

A Social Stories intervention package was used to teach 2 students with autism to read Social Stories, answer comprehension questions, and engage in role-plays under normal classroom environment. The observers were two children with different background and different school. But the control activities are the same (Jeffrey M. Chan and Mark F. O'reilly.2008).

From the literatures above, referring to testing framework that use for this research in the real situation. In fact, the teacher will be taught and control all the students in the class with the real learning environments that would be use in the further study.

### Control Samples

Control variables are to measure equality of samples in a comparative study in each different environment. The method that can be applied for this research which comparing between two different impaired groups. "Take the test emotionally comparison between normal children, children with autism and children with mental disabilities. In order to, understand what is causing the emotion that has been controlled by the user. And how to improve the level of spirit and the actual age in each group of children major groups continue to be at a level equal (Simon Baron-Cohen.1991) ".

From above, the literature suggests that even though the research used a sample of children with autism in different groups in different areas. The control some variables to be consistent and in accordance with the nature of the research will be able to sample such representation without the original sample moving to the area to study.

**Research and observation**

"The good research and observation could be concerned two important things to observe in order to support the facts of the research is to increase the number of observers by the prospect of change in a variable. If the observer is not long enough or variable does not change fast enough, two things should be done is adding observation or increase the range of the term observers to be more (John E. Ettlie, 1977) ".

In terms of this research observational could develop the design that increasing the period of observation to two more weeks in each environment, which refers to the observation of 14 days per environment.

**The period of observation**

The sample of research using the arts curriculum tests with children with autism in the classroom. The researcher has spent a year of this study by using art activity test. In addition, the activity of the test was the artwork; two artworks per week and spent 40 minute in each time (Mary J. Rouse and Guy Hubbard. 1970).

Another sample is using a Social Stories Intervention Package, which involved 2 students with autism who has a different background, different school but the same activity used in an inclusion setting in the normal environment. The package consisted of three steps: (1) Read the story, (2) Answer comprehension questions, and (3) Role-play the social situation. All steps of the intervention were observed 4 times a week or at lease 5 times a week for 10-20 minutes per time depends on the story. (Jeffrey M. Chan and Mark F. O'reilly.2008).

In terms of this research observational could develop the design that involving with the period of observation in normal environment corresponding to reliable data.

**Research Tools**

In this study using a performance assessment tools to gather information for a wide range of research.

Table 2.2 The sample of a performance assessment tools

| Level | Types of assignment | | | | | |
|---|---|---|---|---|---|---|
| | A | B | C | D | E | F |
| 8 | | | | | | |
| 7 | | | | | | |
| 6 | | | | | | |
| 5 | | | | | | |
| 4 | | | | | | |
| 3 | | | | | | |
| 2 | | | | | | |
| 1 | | | | | | |

(Mary J.Rouse and Guy Hubbard,1970)

The tools that use in the research should be considered based on the suitability of the research process and the purpose of gathering information. The research tool that used in this study is behavior observation and recording. By considering the number of accrued behavior of each sample in the study environment. However, the format should be obviously and ease to understand in order to be analyses in further study.

**Data Collection**

In the observation, the researcher has put the code of child and adults behavior systematically. The behavior of the test is continuing and ranked among the observation. The observer will put the code of the stimuli as environmental factors that occurred as well in order to, classify various factors. Though, while observing the researcher also recorded behavior of children, the behavior of adults towards children and the occurred environmental factors. For example, while recording behavior between children and adults. It also would have recording environmental factors such as working in group, individual working, using a class material which is not only behavior but also involve in other factors as well.

The frequency of disturbance behavior during recording referring to the interpretation in terms of disturbed student and the frequency of class control by teacher. The definitions of words or physical expression of the children were divided into four factors 1) Instructor Management 2) teaching activities 3) class materials 4) the distance between the child (Maureen A. Conroy, Jennifer M. Asmus, Brian A. Boyd, Crystal N. Ladwig and Jennifer A. Sellers.2007).

According to the literature above we could relate to the data collection in this study to be more systematically structure. Moreover, lead to understand which other factors that need to be observed such as the frequency of behavior, activity and the environment factor. That could bring these issues to the design development research and also data collection to be more systematically.

**Data analysis**

In the study of the behavior in the classroom and the separation of children with autism should have analyzed the direct and indirect relationship is the relationship between children and the environment and between children and teachers in the classroom (Maureen A. Conroy, Jennifer M. Asmus, Brian A. Boyd, Crystal N. Ladwig and Jennifer A. Sellers.2007).

According to the example above, is the guideline to analyze data on the connection between the children with autism and the physical environment and interact with other people in that environment.

### 2.5.2 Bringing the findings to be used in research methods

**The idea of the characteristics of children with autism**

Under this concept, the researcher was selected a child with autism and Autistic Disorder aged between 3 years old to 7 years old and IQ level and the cause of disease is not determined to be the sample of this research. The reason of choosing Autistic Disorder as the sample of this research because of there is disable in all aspects. In order to, represent a characteristic of the impairment among other symptoms. Additionally, the reason that not determined IQ and cause of disease in the sample of this study. Because of the study environment for behavior therapy, in fact, a group of children with IQ scores to be shared. Thus, to make the learning environment for modeling can support the work covered in the study group needed to study children with IQ scores range as well.

**The potential development of children with autism**

According to a study of the development of children with autism lead to understand the principle and the potential development methods. There is the behavioral therapy by the teaching in the classroom focusing on the training program simultaneously with the teaching environmental management.

Therefore, the researcher was selected this sample to be the research tool of this study taking place under the conditions of a special education classroom.

**The concept of the relationship between symptoms of autism and the physical environment**

In accordance with, review of the literature lead the researcher realized the relationship between symptoms of autism and the physical environment around children. The environment in their home and involving treatment environment. Consequently, the various environments can cause the appropriate and inappropriate behavior.

As this result, the researcher realized that the environment is a part of treatment tools and also the variables related to physical environment characterized by impairment as the following.

**Impairment in managing and commanding**

- Access area sequence
- Using symbols in the events sequence

**Impairment in processing social information** is divided and physical environment factors. And factors interact in the area. The details are as follows

Physical environmental factors

- The activity area size per a child
- The flexibility of the physical environment.

Interact in the area factors

- Seating position between teachers and students in group activities and individual activities
- The distance between the seats of teachers and students in individual activities, group activities and class activity

Processing sensory information and impairment in processing sensory information. Divided into impaired visual perception and impaired perception of sound.

Impaired visual perception

- The complexity levels of decorating pictures
- Room decorated with mobile hanging in the environment
- The distance from the window to the seat
- The distance from the door to the seat
- The size of the openings at eye level
- The proportion between the size of the opening and the room size
- The view seen through the opening
- The distance between the activity area and the material area
- Area partition

Impaired perception of sound

- The distance between each classroom

- The gap between the classrooms
- The characterize of the hallway outside the classroom
- Using audio in the classroom

**The Special Needs Education Concepts**

Special Needs Education is the practice of educating students with special educational needs in a way that addresses their individual differences and needs. Children with autism, which, Ministry of Education was defined into one of the impairment. Students with these kinds of special needs are likely to benefit from additional educational services such as different approaches to teaching. The special needs education is also a center for various developmental to assist children with autism. In order to practice the children before study with normal children, according to the sample of this study. The researcher was selected two environments of the study that could providing support and develop children with autism. The two environments are Special Education public located in Din Daeng, Bangkok and Institute Sang Sa wang foundation located at Klong Ton District, Bangkok.

**The concept of Methodology model involving people with autism**

This concept is studies from previous research that set the issue of research design in the following aspects of the test design, control sample, the observational research and the period of observation, research tool, data collection and data analysis as the details are follows.

**The test design**

Referring to testing framework that use for this research in the real situation. In fact, the teacher will be taught and control all the students in the class with the real learning environments.

**Control samples**

Even though the research used a sample of children with autism in different groups in different areas. The control some variables to be consistent and in

accordance with the nature of the research will be able to sample such representation without the original sample moving to the area to study.

**Research observation and the period of observation**

According to the sample of behavior observed in a previous study could develop the design that increasing the period of observation to two more weeks in each environment, which refers to the observation of 14 days per environment. And also could develop the design that involving with the period of observation in normal environment corresponding to reliable data.

**Research Tools**

The research tool that used in this study is behavior observation and recording. By considering the number of accrued behavior of each sample in the study environment. However, the format should be obviously and ease to understand in order to be analyses in further study.

**Data collection**

According to the literature above we could relate to the data collection in this study to be more systematically structure. Moreover, lead to understand which other factors that need to be observed such as the frequency of behavior, activity and the environment factor. That could bring these issues to the design development research and also data collection to be more systematically.

**Data analysis**

According to the previous research, is the guideline to analyze data on the connection between the children with autism and the physical environment and interact with other people in that environment.

# Chapter 3

## Methodology

Students with autism have seriously impaired social relationships. Many students with autism resist human contact and social interactions from a very early age, and they have difficulty learning the subtleties of social interactions. They often have significantly delayed language development, and struggle to maintain a conversation with another person. Inclusion is a process by which children with special needs receive remedial services in the least restrictive environment (LRE) especially in the regular classroom. For ASD students in a poorly designed classroom, their environment can distance them from learning. Instead, if more at ease in their surroundings, in an ASD friendly environment, the ASD students stands a greater chance of doing better.

Therefore, this study seeks to identify what environmental factors and considerations contribute most to the ASD friendly classroom and we questioned that how to design Autism-friendly classroom which considering on physical environment factor and the development of Autistic children? Which including sub-questions as bellow.

- What is the best environment that can be increase ASD student impairment in managing and commanding?
- What is the best environment that can be enhancing impairment in processing social information?
- What is the best environment that can be increase ASD student impairment in processing sensory information and impairment in learning?

## 3.1 Research design

### 3.1.1 Paradigm Research

This research used quantitative research approach in order to describe the causal relationships of the study by considering the operation framework. Additionally, we using statistical analysis in order to get the accuracy data based on the numeral data to support the evidence of the finding.

As this result, this research should study the way as quantitative research aims to find answers in the research. Research conducted under the framework. It also includes the integration of various data to be analyzed with a statistical program. And building the credibility of the data with the data repeatedly (Test-Retest Reliability) factor analysis then the data were analyzed by statistical tests including T-test to compare the internal factors and ANOVA for each variable and the statistical analysis of variance between groups of variables and the results of the analysis of each objective in order to answer the research question preset system.

### 3.1.2 Post Occupancy Evaluation

Quantitative research could be found out the result in several ways. This study evaluated the results after occupying space (Post Occupancy Evaluation: POE) is one method to study the data to be analyzed to derive answers to the research.

The reason of choosing POE to be the main approach of this study because of the purpose of the required data for the form of repetitive behavior of children with autism as expressive activities within the classroom environment. The survey was conducted within the physical form factor. The storage features such as interviews or questionnaires were not suitable for children to seek answers from autism because they cannot communicate directly. It must be observed in order to evaluate the use of the space under the physical environment in the classroom. The reliability of the information provided.

## 3.2 Research plan

### 3.2.1 Pilot study

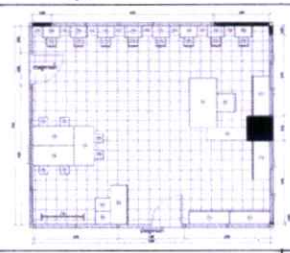
1) Creation of an observation of children with autism.

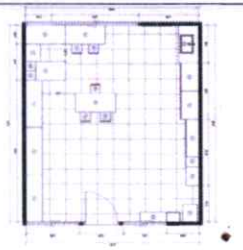
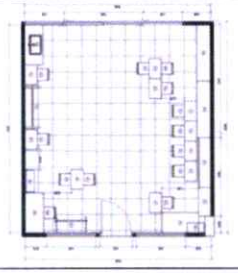
ASD behavior observation by Pilot study would not be suitable for this case. Due to the observers in this area are the children with autism. In addition, the observation might disturb their developmental activities. We have to realize that ASD student are sensitive to environment-changed condition. Consequently, we need to be aware that this process might be block child's development. Therefore, in this study was used to process the data collected is reliable with a Retest reliability of the data to determine, by gathering data from observations of the recorded video. Then, observe and identify their behavior. As this result, we have collected of all 21 behaviors and then re-recorded (Test-Retest Reliability) from recorded video with the same set of behavioral characteristics, which were 90 percent passed. In the second procedure, is to create the observed behavior to reduce the number of variables in behavior by using factor analysis to reduce the number of variable behavior of the child. And set a variable expression of children with multiple in the same group by organized a group by of four variables, which have to be used for the statistical analysis in the next procedure these will be discussed in detail in Chapter 4, Section 4.1.

2) To explore the classroom's physical environment

Exploring the physical characteristics of each classroom environment by follow the approaches to environmental factors from the literature and environment survey. By using surveys approach to collected the environment data. Assistant researcher and Head of Research Environment collected the data. The study including 6 environments in 2 schools; there are 3 environments of Din-daeng special education center schools and 3 environments of Institute Saeng Sawang Foundation as shown in Table 3.1

Table 3.1 Show physical characteristics of each classroom environment.

| Environments | Layout plan | Physical Environment |
|---|---|---|
| Din daeng1<br>(Environment1) |  |   |
| Din daeng 2<br>(Environment2) |  |   |
| Din daeng 3<br>(Environment3) |  |    |

| Environments | Layout plan | Physical Environment |
|---|---|---|
| Saengsawang 1<br>(Environment 4) |  |    |
| Saengsawang 2<br>(Environment 5) |  |    |
| Saengsawang 3<br>(Environment 6) |  |    |

Choosing a classroom environment principle

In this study was obtained from the literature including study concepts and theories. Moreover, it includes a survey of the physical environment of the area, the actual factors of physical environment, the variable nature of disabilities and the variable behavior of children as detailed in Table 3.2. The data shown the physical environment factors of the classroom that acquired from the physical environment in the classroom observation. As this result, the researcher was acquired 6 connected to the environment surrounding the two schools are Din-daeng special education center (environment 1-3) and Institute Saeng Sawang Foundation (environment 4-6).

Table 3.2 Show environment variable obtained.

| literature Review | Survey of the physical environment /Classroom observation |
|---|---|
| Environment factors<br>- The Access area sequence.<br>- The use of symbols in the sequence of activities.<br>- Average area of activity within the environment per child.<br>- Flexibility of the physical environment.<br>- Seat position is referring to the seat between teachers and students in the classroom.<br>- The complexity levels of decorating pictures.<br>- Mobile hanging or the decoration of the classroom by mobiles.<br>- The distances between the seats and the windows. | Environment factors<br>- The sizes of the openings at the eye level.<br>- The proportions between the sizes of openings and the room sizes.<br>- View seen through the openings.<br>- The gap between classrooms<br>- The characterize of the circulation outside the classroom.<br>- Distance between the seats of teachers and students. |

| literature Review | Survey of the physical environment /Classroom observation |
|---|---|
| - The distances between the seats and the door.<br>- The distances between the activity areas and the areas that keep the materials.<br>- Area partition or the factor to see whether the area was partitioned into different activities.<br>- Distance between each classroom.<br>- Using audio in the classroom. | |

### 3.2.2 Main study

The main study explores the main factors in the physical environment of the Autism-friendly classroom, which involve with their development. By studied ASD children's characteristics, behavior and development that consistent with the symptoms of children with autism. Also, studied 19 factors of physical environment that affecting ASD development, according to the three research questions are as follows.

The main question 1: What is the characteristics and behavior of children with autism for each group?

The main question 2: What is the physical environment is conducive to the development of children's activities autism looks like?

Sub-questions 2.1: Which type of physical environment in any manner can reduce fault management dictates of children with autism?

Sub-questions 2.2: What type of physical characteristics and activity can reduce impaired social information processing of children with autism?

Sub-questions 2.3: What type of atmosphere can reduce impaired information processing sensory stimuli, perceptions, and learning disabilities?

### 3.3 Conversion defines the concept to defined as operating

#### 3.3.1 The relationship between the concepts of the research question

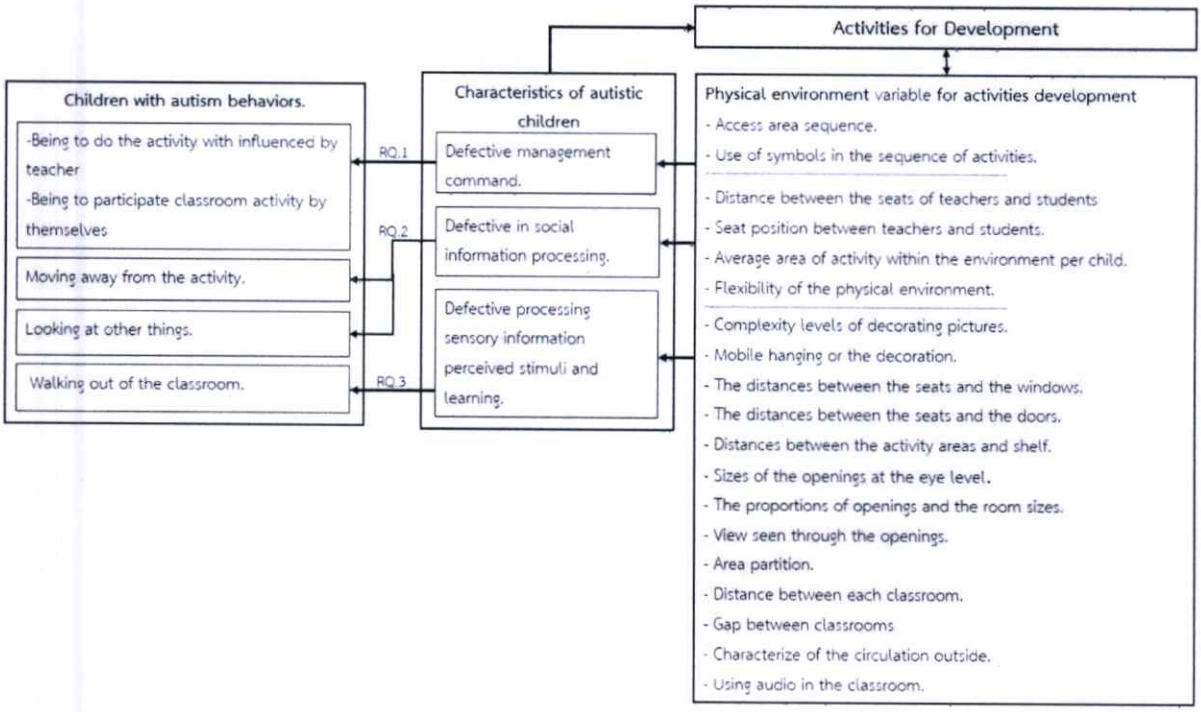



Figure 3.1 Show the relationship between the concepts of the research question.

Title 3.3 Show environment variable and operational.

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Environment | Access area sequence. | Use of symbols in the sequence of activities. | Average area of activity per child. | Flexibility of the physical environment. | Seat position is referring to the seat between teachers and students. | Distance between the seats of teachers and students. | Complexity levels of decorating pictures. | Mobile hanging or the decoration. | Distances between the seats and the windows. | The distances between the seats and the doors. | Distances between the activity areas and shelf. | Area partition | Distance between each classroom. | Gap between classrooms | Sizes of the openings at the eye level. | The proportions of openings and the room sizes. | View seen through the openings. | Characterize of the circulation outside. | Using audio in the classroom. |
| Din daeng 1 (Environment 1) | Yes | Yes | 0.5 sq.m. | No | Beside + Independent | 0.61-0.9 m. | Moderate | Yes | 3.2 m. | 4 m. | 1.6 m. | Partitioned | 10 m. | Corridor+ Hall | 11-11.5 sq.m. | 16% | Active | Elevator hall | Non |
| Din daeng 2 (Environment 2) | | | 0.3 sq.m. | | | 0.31-0.6 m. | High | No | 4 m. | 3.7 m. | 1.7 m. | | | | 4.5-5 sq.m. | 6% | | Sub circulation | |
| Din daeng 3 (Environment 3) | | | 0.5 sq.m. | | | 0.61-0.9 m. | | Yes | 3.3 m. | 4 m. | 2.2 m. | | 5 m. | | 6.5-7 sq.m. | 10% | | Hall | |
| Saengsawang 1 (Environment 4) | No | No | 0.7 sq.m. | Yes | Beside + Independent + Opposite | 0.61-0.9 m. | non | No | 4 m. | 5.2 m. | 0.3 m. | Non | 0 m. | partition walls | 2-2.5 sq.m. | 3% | | Main and Sub circulation | Yes |
| Saengsawang 2 (Environment 5) | | | 0.9 sq.m. | | | 0.0-0.3 m. | Moderate | Yes | 2.6 m. | 3.5 m. | | | 0 m. | partition walls | 8.5-9 sq.m. | 11% | Active+ Passive | | |
| Saengsawang 3 (Environment 6) | | | 0.6 sq.m. | | Independent + Opposite | 1.21-1.5 m. | Less | No | 3.3 m. | | | | 0 m. | partition walls | 3.5-4.0 sq.m. | 4% | | | |

### 3.3.2 Variables definition

1) The physical environment of children with autism.

1.1) Access area sequence is the way to set up classroom environment by daily activities order. It calls for the alignment of the sequential organization of space and the daily routine of the users, through a series of smooth transitions from one space to another, in a manner that follows the typical daily schedule of users. Considering on how different between the environment with access area sequence and the environment without access area sequence. So, the researcher found that Din-deang special education center which is has access area sequence but Institute Saeng Sawang Foundation has no access area sequence the result are shown below in Figure 3.2


With access area sequence  without access area sequence

Figure 3.2 Show the access area sequence.

1.2) Using symbols in the events sequence is refer to the environment with using or without using symbols or tables to check on the sequence of classroom's events during the day in order to let the children with autism know what to do first and later, which found that Din-deang special education center with using symbols in the activities sequence all three environment. On the other hand, Institute Saeng Sawang Foundation has not using symbol in the sequence of activities in all three environments. See example the use of symbols in the sequence of activities in Figure 3.3

Figure 3.3 Show the use of symbols in the sequence of activities.

1.3) Average area of activity within the environment per child by the unit is square meters. The survey found that the 1st environment area of Din-deang special education center has an area of 0.5 square meters, the 2th environment area measures 0.3 square meters and in the 3rd environment area measures 0.5 square meters respectively. However, Institute Saeng Sawang Foundation found that in the 4th environment area measures 0.7 square, the 6th environment area measures 0.9 square meters and the 6th environment area of 0.6 square meters respectively.

1.4) Flexibility of the physical environment refers to the classroom environment, which the user can modify the area that appropriate to each activities. According to the classroom's physical environment survey was found both flexible and inflexibility; Din-deang special education center were inflexible usage area in all three environments. In contrast, found that Institute Saeng Sawang Foundation were flexible use in all three environments.

1.5) Seat position is referring to the seat between teachers and students in the classroom during the classroom activities within the classroom environment. Including sitting next to each other, sit opposite each other between teachers and students and student sitting independently. However, after observation found that both Din-deang

special education center and Institute Saeng Sawang Foundation have the same result as shown in Figure 3.4

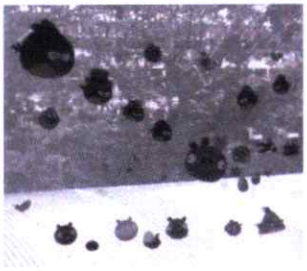
Sitting beside | sitting opposite side | Students sit independently

Figure 3.4 Show the seat between teachers and students in the classroom during the classroom activities.

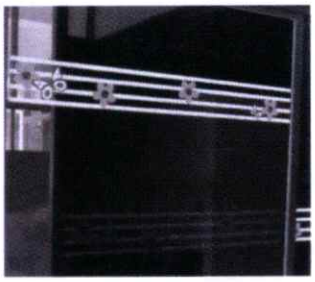
1.6) Distance between the seats of teachers and students as they do activities referring to; the range of the seat between teachers and students while they do activities as measured by meters. And found that the 1st environment area of Din-deang special education center measures distance in the range of 0.61 to 0.9, the 2nd environments are spaced in a range from 0.31 to 0.6 m and the 3rd environment at a distance in the range of 0.61 to 0.9. However, Institute Saeng Sawang Foundation found that in the 4th environment has distance ranges from 0.61 to 0.9 meters, at a distance of the 5th environments ranged from 0.0 to 0.3 meters at a distance of the 6 environments ranged from 1.21 to 1.5 meters.

1.7) The complexity levels of decorating pictures refers to the complexity of the interior environment of the classroom, which is a high complexity, moderate complexity, less complexity and non- complexity. Considering divided by the total number of pictures in each sub-area of the image as shown in Figure 3.5

High complexity



Moderate complexity



Less complexity

Non-complexity

Figure 3.5 Show the levels of pictures used for decoration or the density of the pictures.

1.8) Room decorated with mobile hanging in the environment means the environment within the classroom by using a mobile hanging or without using. The researcher found that in 1 environment and 3 environment of Din-deang special education center has used a mobile hanging except the 2 environments has not used the mobile hanging. And also just only the 5th environment of Institute Saeng Sawang Foundation has used the mobile hanging except the forth and the sixth environment has not used as shown in picture 3.6

Using mobile hanging

Without using mobile hanging

Figure 3.6 Show the room decorated with mobile hanging in the environment.

1.9) The distance from the window to the seat means the average distance between the seats made of children with autism in the classroom environment. Found that the distance of the seat made of children with autism to close the window is 2.60 meters long and 3.20 meters, 3.30 meters and 4.00 meters respectively, as shown in Figure 3.7

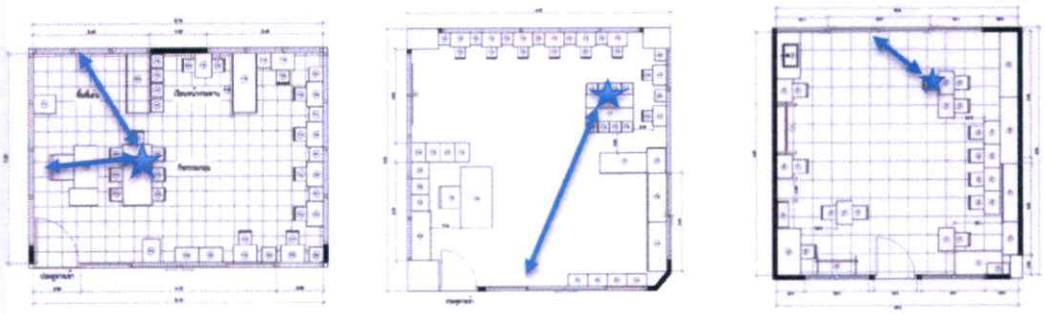


Figure 3.7 Show the distance from the window to seat.

1.10) The distance from the seat to the door represents the average distance between the seats and children with autism in a classroom environment. The researcher was found that the appropriate distance should be 3.50 meters long and 3.70 meters, 4.00 meters and 5.20 meters, respectively in order to reduce the behavior of moving away from the activities as shown in Figure 3.8

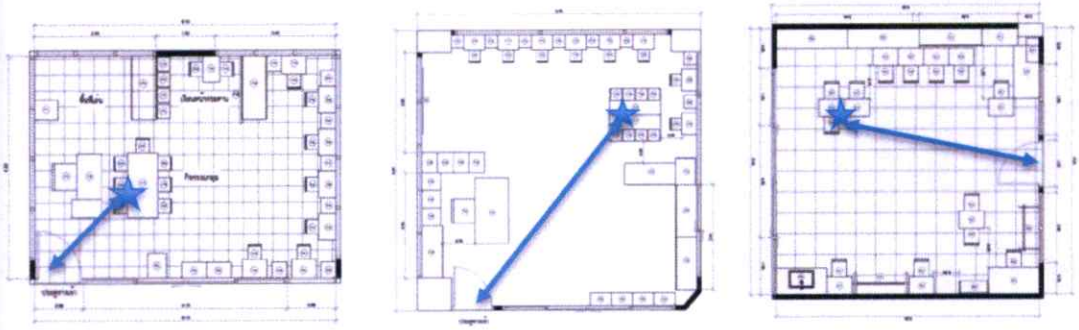


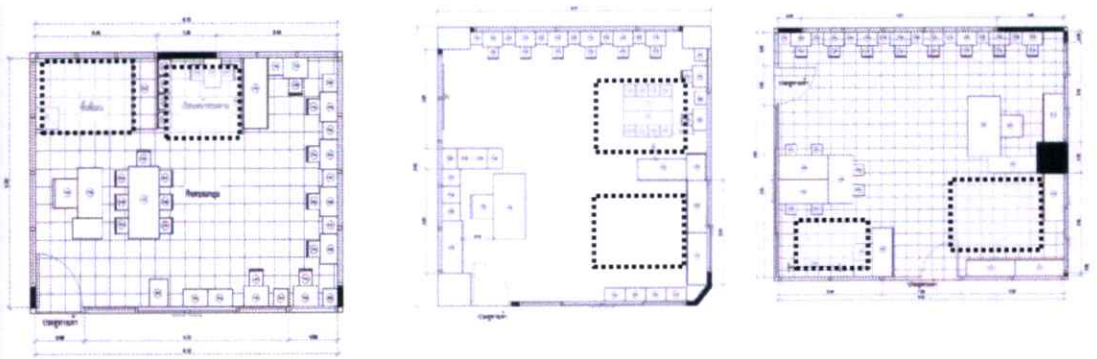
Figure 3.8 Show the distance from the seat to the door.

1.11) The distance between the activity area and the material area refers to the distance between the activity area of children with autism to the material storage. The

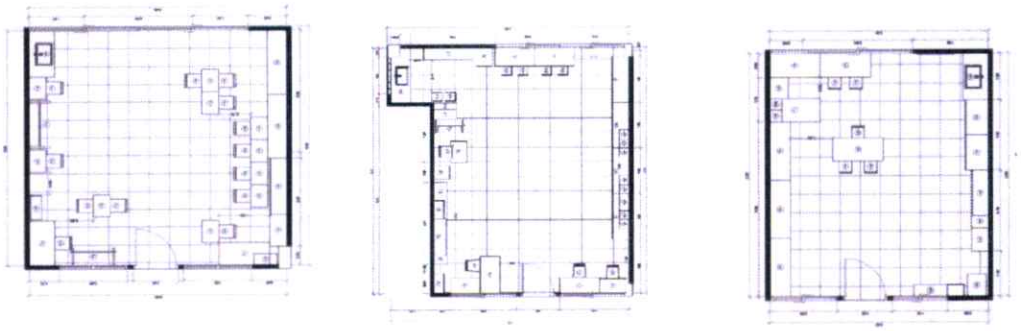
result was showed the distance between the activity area and the material area a close-end is 0.3 meters long, 2.2 meters, 1.6 meters and 1.7 meter. Maintaining this distance can help reduce the behavior of looking at other things rather than the activities, the sample of measure the distance of the seat from the storage are shown in Figure 3.9

Figure 3.9 Show the distances between the activity areas and the areas that keep the materials.

1.12) Area partition referring to the difference between the room without and the room with area partition each activity area apart by cabinet. Which, the result is show in Figure 3.1



Area partitioned



None partitioned

Figure 3.10 Show area partition or the factor to see whether the area was partitioned into different activities.

1.13) Distance between each classroom refers to the geographical distance between each classrooms measured in meters. The data found that Institute Saeng Sawang Foundation classroom has a distance of 0.00 meters in classrooms with adjoining walls. And Din-deang special education center has a distance of 5 meters and 10 meters.

1.14) The gap between classrooms referring to the physical distance between the classrooms. From the data found that Institute Saeng Sawang Foundation is a room adjoining the classroom which partition walls with masonry. However, Din-deang special education center has corridors, halls way and front of the elevator foyer is to divided the gap between classroom. As the example are shown in Figure 3.11

Adjoining classroom

Front corridor

Front of elevator corridor

Hallway

Figure 3.11 Show the gap between classrooms.

1.15) The openings with eyes level means to the opening that can see views-out within their eyes level. Find openings with the smallest range is 2.0 to 2.5 square meters, 3.5 to 4.0 square meters, 4.5 to 5.0 square meters, 6.5 to 7.0 square meters, 8.5 to 9.0 square meters and11.0 to 11.5 square meters is the largest one.

1.16) The proportion between the size of the opening and the room size refer to the openings with eyes level size comparing to the room size which found the data of the environment that include the area following the proportion of the opening of 3%, 4%, 6%, 10%, 11% and 16% respectively.

1.17) The view seen through the opening represents a view outside the classroom environment that student can see through the opening. The environment can be seen from the open environment within a panoramic view, is a stimulating scenery like people walking pass, such as at the stairs, doorways or openings that can see a car moving through or rapidly moving scenery. However, relaxing scenery is the panoramic views were found in the sky views, the treetops views and slow movement scenery is shown in Figure 3.12

Stimulating Scenery

Relaxing Scenery

Figure 3.12 Show The view seen through the opening represents a view outside.

1.18) The characterize of the circulation outside the classroom refers to the corridor outside the classroom both the front and back of the classroom which found that there are the front of elevator corridor, hallway corridors and sub circulation. Moreover, found that in the 1st environment of Din-deang special education center has the hallway front of the elevator, 2nd environment has a sub front circulation and 3rd environment has a front hall. Conversely, in 4th environment, 5th and 6th of Institute Saeng Sawang Foundation has the main circulation rooms and the second circulation at the back as shown in Figure 3.13

Front of elevator corridor

Sub circulation

Hallway corridor

Main circulation

Figure 3.13 Show the hallway outside the classroom

1.19) Using audio in the classroom refers to using or non-using audio during the development activity for children with autism in the classroom. Found that there are non-using audio in the classroom all of 3 environments in Din-deang special education center. In contrast, there are using audio in the classroom all of 3 environments in the hallway outside the classroom.

2) Children with autism behaviors.

2.1) Children with autism being to participate classroom activity by themselves meaning to the behavior of children with autism that they can do various day activities during the day themselves such as walking to the meeting point without the guidance by the teacher such as holding hands to lead them to do or repeated calls which is could identify to the impairment of the order processing.

2.2) Being to do the activity with influenced by teacher refer to children with autism behavior that could not being to do a daily activity themselves. In general, teacher must be guild them such as holding hands to lead them to do or repeated calls to do and do not know what to do first and later as identify as the impairment of order processing.

2.3) Moving away from the activity meaning to these 7 behavioral including walked to the window, walked around the room when teacher is away, standing up, pay attention to the fan, walked to the door, walked to other areas and standing up when teachers is away are shown in Figure 3.

2.4) The behavior of looking at other things rather than focusing on the activities is defined as a group of 6 behavioral including look at other child in the classroom, looked outside at the external sound outside the classroom, look outside the window at the stimulating scenery, looked around the room, looked outside the door and looked around the room when the teacher away as shown in Figure 3.

2.5) The behavior of walking out of the classroom referring to the behavior that children with autism walking out of the classroom and staring to the shelf as shown in Figure 3.14

Moving away from the activity.

The behavior of looking at other things.

The behavior of walking out of the classroom.

Figure 3.14 Show children with autism behaviors.

Behavioral 2.3-2.5 refers to characteristics of behaviors of children with autism; 21 behaviors were found in this study. To verify the information, Test-Retest Reliability was conducted with the first set of information. Factor analysis was used for exploratory factor analysis (EFA), and the Scree Plot was also considered. After the group of factors was obtained, confirmatory factor analysis (CFA) was conducted in order to examine the structure of the variable group. From this process, three new variables were derived these will be discussed in detail in Chapter 4, Section 4.1, including the behavior of moving away from the activity, the behavior of looking at other things rather than focusing on the activities, and the behavior of walking out of the classroom is the variable factor for question 2.2. The characteristic of the impairment in processing social information in question 2.3. The characteristic of the impairment in processing sensory information and impairment in learning (impairment of sight and sound sensory) see the table 3.4. See Table 3.4 is shows a summary of the research variables according to research question.

Table 3.4 shows a summary of the research variables according to research question.

| Research Question | Variable |
|---|---|
| **The main question 1:** What is the characteristics and behavior of children with autism for each group? | Fault management dictates of children with autism.<br><br>1) Being to participate classroom activity by themselves<br>2) Being to do the activity with influenced by teacher.<br><br>- Impaired social information processing of children with autism.<br><br>- Impaired information processing sensory stimuli, perceptions, and learning disabilities.<br><br>3) Moving away from the activity.<br>4) The behavior of looking at other things.<br>5) The behavior of walking out of the classroom. |
| **The main question 2:** What is the physical environment is conducive to the development of children's activities autism looks like?<br><br>Sub-questions 2.1: Which type of physical environment in any manner can reduce fault management dictates of children with autism? | 1) The access area sequence.<br>2) The use of symbols in the sequence of activities. |
| Sub-questions 2.2: What type of physical characteristics and activity | 1) Average area of activity within the environment per child. |

| Research Question | Variable |
|---|---|
| can reduce impaired social information processing of children with autism? | 2) Flexibility of the physical environment<br>3) The seat between teachers and students<br>4) Distance between the seats of teachers and students |
| Sub-questions 2.3: What type of Physical characteristics can reduce impaired information processing sensory stimuli, perceptions, and learning disabilities? | 1) The levels of pictures used for decoration or the density of the pictures.<br>2) The room decorated with mobile hanging in the environment.<br>3) The distance from the window to seat.<br>4) The distance from the door to seat.<br>5) The openings with eyes level.<br>6) The proportion between the size of the opening and the room size.<br>7) The view seen through the opening represents a view outside.<br>8) The distances between the activity areas and the areas that keep the materials.<br>9) Area partition.<br>10) Distance between each classroom.<br>11) The gap between classrooms.<br>12) The caracterize of the circulation outside the classroom.<br>13) Using audio in the classroom. |
| **The main question 3:** What it the affects of development activities toward the development of children with autism in each group? | 1) Group Activities.<br>2) Single Activities.<br>3) Board Activities. |

Table 3.5 Shows a summary of the research variables definition to indicator level of measure and data collection.

| Constructs | Variables Definitions | Indicator | Level of Measure ment | Data Collection Instrument | Data Analysis |
|---|---|---|---|---|---|
| Physical environment in any manner can reduce fault management dictates of children with autism. | The access area sequence. | | Norminal | Survey | T-test |
| | The use of symbols in the sequence of activities. | | | | T-test |
| Physical characteristics and activity can reduce impaired social information processing of children with autism. | 1) Average area of activity within the environment per child. | 0.30, 0.50, 0.60, 0.70 and 0.90 Sq.m. | | | One Way ANOVA |
| | Flexibility or not of the physical environment | | | | T-test |
| | The seat alone and side in front of teachers and students in group activities. | | | | |
| | The seat alone and in front of teachers and students in single activities. | | | | |
| | Distance between the seats of teachers and students for | 0.00-0.30, 0.31-0.06 , 0.61-0.90 and 1.21-1.50 m. | | | One Way ANOVA |

| Constructs | Variables Definitions | Indicator | Level of Measure ment | Data Collection Instrument | Data Analysis |
|---|---|---|---|---|---|
| | group activities. | | | | |
| | Distance between the seats of teachers and students for single activities. | Alone and 0.00-0.30 m. | | | T-test |
| | Distance between the seats of teachers and students for board activities. | 0.91-1.20 and 1.21-1.50 m. | | | |
| **Physical characteristics can reduce impaired information processing sensory stimuli, perceptions, and learning disabilities.** | The levels of pictures used for decoration or the density of the pictures. | | Ordinal | Survey | One Way ANOVA |
| | The room decorated with mobile hanging. | | Norminal | | T-test |
| | The distance from the window to seat. | 2.6,3.2 ,3.3 m. | Norminal | | |

| Constructs | Variables Definitions | Indicator | Level of Measure ment | Data Collection Instrument | Data Analysis |
|---|---|---|---|---|---|
| | The distance from the door to seat. | 3.5 , 4 , 5.2 m. | | | |
| | Size of openings with eyes level. | 2.0-2.5,3.5-4.0, 4.5-5.0 , 6.5-7.0,8.5-9.0 and11.00-11.5 Sq.m. | | Survey | One Way ANOVA |
| | The proportion between the size of the opening and the room size. | 3%, 4%, 6%, 10%, 11% and 16% | | | |
| | The view seen through the opening represents a view outside. | | | | T-test |
| | The distances between the activity areas and the areas that keep the materials. | 0.30 ,1.60, 1.70 and2.2 m. | | | One Way ANOVA |
| | Area partition. | | | | T-test |
| **Physical characteristics can reduce impaired information** | Distance between each classroom. | 0 , 5 and 10 m. | | | One Way ANOVA |
| | The gap between classrooms. | | | | T-test |

| Constructs | Variables Definitions | Indicator | Level of Measure ment | Data Collection Instrument | Data Analysis |
|---|---|---|---|---|---|
| processing sensory stimuli, perceptions, and learning disabilities | The characterize of the circulation outside the classroom. | | | Survey | One Way ANOVA |
| | Using audio in the classroom. | | Norminal | | T-test |
| Behavior of children with autism | 1) Being to participate classroom activity by themselves<br>2) Being to do the activity with influenced by teacher.<br>3) Moving away from the activity.<br>4) The behavior of looking at other things.<br>5) The behavior of walking out of the classroom. | | Ratio | Observation by Video record | |

### 3.4 Research tools

#### 3.4.1 Observational

The tool for this research was observing environmental behavior, which was used to examine the interaction between autistic children and their environment. The data were collected by non-participant. The tool for this research was observing environmental behavior which was used to examine the interaction between autistic children and their environment. The data were collected by non-participant observations during the children's activities, which were video recorded. This is because children with autism are responsive to the environment and stimuli extra from those in their daily life. The

behaviors were transcribed from the video and then recorded in the table in order to understand their characteristics and numbers. By used the video camera inside the environments into 2 positions, which is placed above the locker and a corner of the classroom. (See picture 3 previewing image placement and movie recording). In order to be able to see the behavior of the sample that is child with autism throughout the environment. Then, recording data throughout the day for a period of two weeks to make the environment more reliable observations over a period of activity each day. This behavior occurs unique enough to be analyzed further. After received the video recorded, then transcribed and classify all behaviors into the form. (See Table 3.6 shown the behavior of children with autism observations)

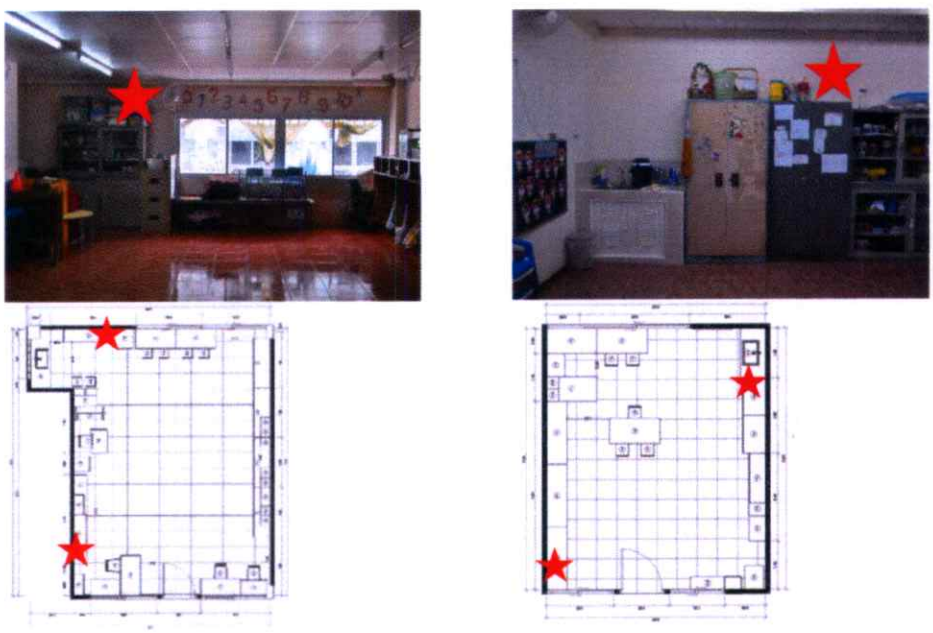


Figure 3.15 Show position of video recorder.

Title 3.6 Show none participate observation form.

| Code ( environment#Number of child) | Behavior 1 | Behavior 3 | Behavior 4 | Behavior 5 | Behavior 6 | ..... | ..... | ..... | ..... | ..... | ..... | Behavior 21 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number | | | | | | | | | | | |
| 1. En.1 #01 | | | | | | | | | | | | |
| 2. En.1 #02 | | | | | | | | | | | | |
| ..... | | | | | | | | | | | | |
| En.2 #01 | | | | | | | | | | | | |
| En.2 #02 | | | | | | | | | | | | |
| ..... | | | | | | | | | | | | |
| En.3 #01 | | | | | | | | | | | | |
| En.3 #02 | | | | | | | | | | | | |
| ..... | | | | | | | | | | | | |
| En.4 #01 | | | | | | | | | | | | |
| En.4 #02 | | | | | | | | | | | | |
| ..... | | | | | | | | | | | | |
| En.5 #01 | | | | | | | | | | | | |
| En.5 #02 | | | | | | | | | | | | |
| ..... | | | | | | | | | | | | |
| En.6 #01 | | | | | | | | | | | | |
| En.6 #02 | | | | | | | | | | | | |

### 3.4.2 Environment Survey

To collecting the physical environment by taking pictures with a digital camera, measuring the opening and furniture by tape rule. And then note all the physical data within the classroom in the notebook. The data were collected by two research assistants and one head of research data obtained from the survey are used in research design in

order to analysis the factor in the analysis the information further. See the surroundings preview image in Figure 3.16

Figure 3.16 Show how to environment survey.

3.5 Primary Study

3.5.1 Sample

The study used Purposive sampling method, in order to obtain appropriate sample for the study. Behaviors of 46 autistic children above 3 years old were assigned to participate in therapeutic activities for a year. Including, Special education center, Bangkok and Institute Saeng Sawang Foundation, Bangkok. By divided 23 samples equally in each selected school; there are 8 case in 2 environment, 7 case 1 environment setting in evenly.

3.5.2 Location Data

The environmental are in this study, which to study and collect the environment data consisting of all 6 environments into 2 schools: 1) Special Education public located in Din Daeng Bangkok; the education given in the school's special education representing the government school. And Institute Saeng Sawang Foundation located in Klong Ton District Bangkok representing the private school. The environment is divided into 6 environments of 3-school environment as well.

3.5.3 Process Data

The first stage of data collection is gathering data about the characteristics of children with autism, the potential development of children with autism, related

environment, teaching approach and an environment that encourage the development of children with autism. And also study and observe the teaching environment in the sample school in order to make questioning, selecting environment to study and design observe tools.

In the part of the survey collected information from the physical environment within the classroom. Researcher was requested the collaborate letter from International College King Mongkut's Institute of Technology Ladkrabang, Bangkok. And provide to Special Education center where are the two sample of the research in order to inform the purpose of the study and to request for the corporation of the physical environment within the classroom for children with autism investigation.

**Fieldwork data collection procedure.**

The researcher was coordinating with the 2 of special education schools that were selected, including, Din-deang special education center and Institute Saeng Sawang Foundation to make a preliminary survey of the area. And consider the possibility of choosing an environment for education and a survey of the number of samples for the possibility of implementing for further study.

Considering to the environment within the classroom and found 6 cases in 2-selected school have an appropriate variable environment for this study. Based on the literature that used for this study and selected different environmental factors to analyze the relationship by comparing the behavior of different types of environments.

In the next stage, is to explore and record the environmental factors within 6 environments by measuring, recording video and gathering the data in the form of a floor plan with furniture and photos in order to analyze variable environmental data that involve to the behavior of children with autism.

In term of, collecting behavior of children with autism within that environment data. The data were collected by non-participant observations during the children's activities, which video recorded. This is because children with autism are responsive to the environment and stimuli extra from those in their daily life. The behaviors were

transcribed from the video and then recorded in the table in order to understand their characteristics and numbers.

### 3.6 Data Analysis

Data analysis using statistical analysis consisted of Factor Analysis to group or combination of variables that are related to the group or to reduce the number of variables Factor behavior of children with autism. By combined variable from 21 observational. In the same to create the behavior of children with autism is a new variant that has four variables and parameters adopted four new variants to be used for further statistical analysis. In this study, we used one ANOVA and T-Test is an analysis of the quantitative research. Statistical test T-test analysis to compare the factors within each variable environment is a measure not more than two and a statistical test ANOVA analysis of factors within each variable environment with indications from two or more.

### 3.7 Quality Assurance Research

3.7.1 Internal Validity; was selected in a sample. All samples are available in the study area, which to study and collect the environment data consisting of all 6 environments into 2 schools: 1) Special Education public located in Din Daeng, Bangkok; the education given in the school's special education representing the government scholl. And Institute Sang Sa wang foundation located at Klong Ton District, Bangkok; the representing the private school.

3.7.2 Reliability; the researcher used the Test-Retest Reliability for this study in order to collected accurate and reliable data. By observed behaviors and has resulted in 90% accuracy.

3.7.3 Objectivity in analyzing quantitative data gathered statistics used One-way ANOVA and T-Test is to analysis of the data. Thus, the finding and research discussion would be obtained from the number analyze.

# Chapter 4

# Results

## 4.1. Establishing criteria for research on how to observe the behavior of Autistic Children

Establishing criteria for research by using behavior observation aimed to process the data collected to be reliable. Observation on behavior of Autistic Children right now has activities within the built-in physical environment of six environments and able to collect 21 behaviors including 1) behavior induce children to start doing activities by teachers 2) behavoir of joining the acitivities by themselves 3) behavior of standing 4) behavior of walking to the window that has the scenery sensual 5) behavior of walking to the window that has scenic senses 6) behavior of walking to the door 7) behavior of walking to other areas 8) behavior of playing with a fan 9) behavior of walking outside of the room 10) behavior lying flat on the floor 11) behavior of turning face to the shelf 12) behavior of looking to the others in the room 13) behavior of looking around the room 14) behavior of looking outside the room through the door 15) behavior of looking to the window that has the scenery sensual 16) behavior of looking to the window that has scenic senses17) behavior of looking following the sound of people in the room 18) behavior of looking following the sound of people outside the room 19) behavior of looking around the room when the teacher is away 20) behavior of standing up when the teacher is away 21) behavior of walking around the room when the teacher is away

4.1.1. According to the review of the literature of the past found autistic children cannot communicate directly, thus, information can not be collected the through interview and these observations must be without partcipation to keep autistic children do not know that someone else is involved so that the real nature

of their behavior can be got but there are not any specific regulations on other behaviors. However, because of the behavior acquired all 21 habits that diverse behavior quite dramatically and some behaviors are an expression of that was not enough to make a proper relationship with the independent variables analyzed immediately.

Therefore, to achieve the accuracy and reliability of the information, the information management has been adopted into two steps including Test-Retest Reliability and Factor Analysis. This can be explained as follows:

The first step is to review the data by observing and recording repeated behavior from the same set of tapes with the first recording behavior to check the reliability of the tool in identifying behavior and found that it can meet the standard 90%. The second step is to create the observed behavior to reduce the number of variables in behavior by statistical process for clear behavior and reduce problems in working by using factor analysis which is the clustering technique or combination of variables that are related to the same factors which is widely popular. This aims to reduce the number of different behavior of the children to handle the variable expression of children in the same group by organizing the groups as new variant to be used for the statistical analysis in the next step. In the first step of the factor analysis, Exploratory Factor Analysis (EFA) was used to explore the behavior of all the variables that which variables are associated with each other a lot to be classified in the same group. By using factor analysis, the value of KMO and Bartlett's Test can be seen. If the value is at .703, which is higher than.5, the value of Approx. Chi-Square at 461.666 and with a significant level at .000 meaning that the variables are corellated with each other. With variable that has Extraction value lower than .400 and has appeared in several variables, there is no relationship between the variables or very poor correlation which will be cut off because it cannot be considered in any factor classification clearly (Table 4.1 shows the variables grouping). Here, four variables are

classified including 1) behavior of walking to the window that has the scenery sensual 2) behavior of lying flat on the floor 3) behavior of looking to the window that has scenic senses 4) ) behavior of looking following the sound of people in the room. It will reduce from 15 variables from the total of 19 variables.

The consideration of varaibles grouping has considered with the graph showing screen plot of the factors involved which will see a different group of variables clearly. Information on the first and after three factors of the fourth factor until the ninth factor is very slightly different. When considering data found that the variables grouping that have correlation should have three factors. After that do the test again to confirm by Confirmatory Factor Analysis (CFA) to determine the structure of the variables by specifying the variables grouped into three elements only and choose the rotation axis by Varimax. Because of all the variables are independent, the result is that some variables when making a rotation from the original member becomes a member of several elements, one element or elements markedly which can be regrouped as follows (Figure 4.1 show the Scree Plot of the factors)

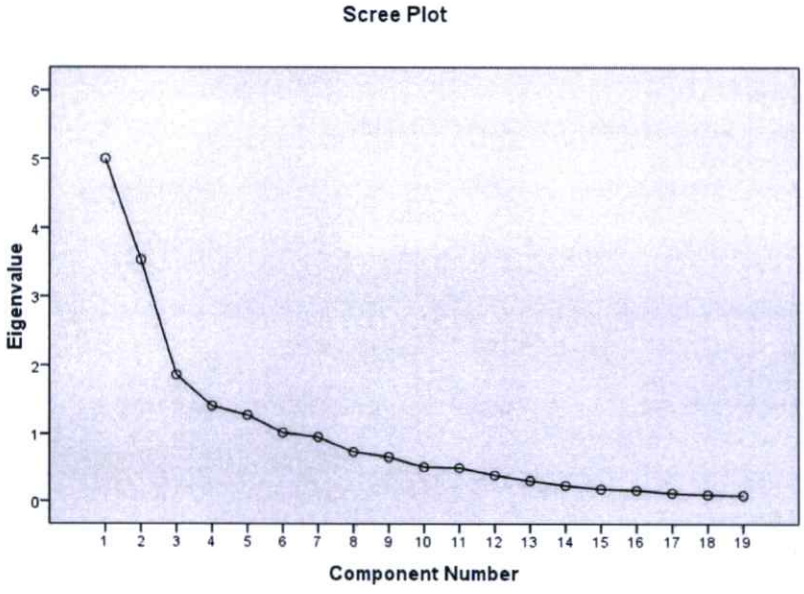



Figure 4.1 shows the Scree Plot of the factors

**Factor 1**: Consists of seven variables are "behavior of walking to the window that has the scenery sensual", "behavior of walking around the room when the teacher is away", "behavior of standing up", "behavior of playing with the fan", "behavior of walking to the door", "behavior of walking to other areas" and "behavior of standing up when the teacher is away". This group behavior is a new variable which called "moving out of the doing activities" by considering from the name of the new variant of this behavior is the behavior that is associated with the movement in the same environment.

**Factor 2**: Consists of six variables are "behavior of looking to the others in the room", "behavior of looking to the sound outside of the room", "behavior of looking to the window that has the scenery sensual", "behavior of looking around the room", "behavior of looking outside the room through the door" and "behavior of looking around the room when the teacher is away". This group behavior is called "behavior of looking to the other things besides the doing activities" by considering all the behaviors are related to the eyesight.

**Factor 3**: Consists of two variables are "behavior of walking out of the room" and "behavior of turning face to the shelf". This group behavior is called "**behavior of going outside**". Since these two behaviors are different, but the behavior of walking out of the room has value of Rotated Component Matrix = .854 which is more than the value of behavior of turning face to the shelf which is = .789. So the importance is given to the variable of behavior of going outside (see Table 4.1 shows the value of Rotated Component Matrix)

**Table 4.1** shows the value of Rotated Component Matrix

| | Component | | |
|---|---|---|---|
| | 1 | 2 | 3 |
| Behavior of walking to the window that has the scenic senses | .899 | | |
| Behavior of walking around the room when the teacher is away | .879 | | |
| Standing up | .772 | | |
| Behavior of playing with the fan | .769 | | |
| Behavior of walking to the door | .714 | | |
| Behavior of walking to the other areas | .703 | | |
| Behavior of standing up when the teacher is away | .622 | | |
| ~~Behavior of looking to the outside of the window that has the scenic senses~~ | | | |
| Behavior of looking to the others in the room | | .888 | |
| Behavior of looking following the sound of people outside the room | | .805 | |
| Behavior of looking outside the room through the door 15) behavior of looking to the window that has the scenery sensual | | .759 | |
| Behavior of looking around the room | | .750 | |
| Behavior of looking outside the room through the door | | .729 | |
| Behavior of looking around the room when the teacher is away | | .676 | |
| ~~Behavior of looking following the sound of people in the room~~ | | | |
| Behavior of walking to the outside of the room | | | .854 |
| Behavior of turning face to the shelf | | | .789 |
| ~~Behavior of walking to the window that has the scenery sensual~~ | | | |
| ~~Behavior lying flat on the floor~~ | | | |

**4.2. The Analysis of Relationship between Environmental Variables and Behavior of Autistic Children in Each Syndrome**

The sencond question of the research question is the characteristic of the environment affecting development each aspect of autistic children. The result of the analysis of the relationship between independent variable is the environment and identity of each autistic child by considering the nature of the defects with the dependent variable was the factor analysis is completed. This means that behavior of autistic children between the activities within the environment that comprises of three behaviors such as 1) behavior of moving out from the activities 2) behaviors of looking at other things other than activities and 3) behavior of walking outside the room.

The nature of the defects of autistic children has three aspects including 1) characteristics of impairments of the executive order 2) characteristics of impairments of social information processing 3) characteristics of impairments of processing sensory informatio, the perception of stimuli and learning disabilities. This is the recognition of eyesight and sound. The environmental factors related to the impairment have overall 19 factors which separate the physical environment and the interaction of people in the area. The physical environment divided into 17 sub-factors including 1) areas grading due to the numbers of the accesses 2) the use of symbols of the sequence of activities 3) area space of the activities of one autistic child 4) capable of flexible space 5) the complexity of classroom decorations with images that are not related to the study at the eyesight level 6) classroom that decorated with hanging decorations 7) the distance of the seat from the window 8) the distance of the seat from the door 9) opening sapce at eye level 10) propotion of the opening space at eye level to the size of the room 11) things to see outside the opening space 12) the distance of the seat to the storage 13) the share of internal living space 14) the distance between the classrooms 15) characteristics of

the distance between classroom to another classroom 16) characteristics of the walkway outside the classroom 17) the use of sound in the classroom. The interaction of people in the area divided into two sub-factors including 1) seat between teacher and student and 2) the distance between the seats of teachers with students during activities.

To display the data analysis, it explains the link between the nature of the shortcomings of the three dimensions of autistic children with the environmental factors associated and the nature of the defect and environmental factors related to the nature of the defect. According to a review of literature and education, the research has concluded that the nature of the disabilities associated with autism in children with environmental factors. The results of this study are as followings:

**4.2.1. Analysis of the Relationship between Physical Environment and Variable Behavior of Autistic Children Characterized by Deficiencies in the Administrative Order**

From the question research 2.1 that dedicates the characteristics of physical environment that can reduce defective management dictates of the autistic children. This analysis links between the environment that characterized by two issues: 1) the ranking of the area due to the ranking of the entry 2) the use of symbols in the ranking of activities by analyzing variants linked to behavior in two ways: the number of times that a teacher of autistic children begin diverting activities, and the number of autistic children can start activities on their own. The details are as followings:

1) The ranking of the area due to the ranking of the entry:

The linking of characteristic defects in the Executive Order with the environmental factors in order to rank by using statistical analysis by T-testto compare the physical environmental factors that behavior convince activities by teachers and the activities of their own of autistic children are different or not.

**Table 4.2** shows the average comparison and a standard deviation of behavior induce the activity and starting the activities by their own with priority access to the area.The result is a priority access to the area has different levels of statistical significance with teacher of autistic children begin diverting activities with the factor that has no priority access to the area (M = 14.65, SD = 3.720) and has priority access to the area [M=7.50,SD=3.017; t(44)=7.004,p=.000]. So with or without priority access to the area influence the behavior induced to start activities.If the environment is not a priority area, the number of teacher behaviors that influence autistic children to begin activities with more environment are priority areas (See Table 4.2 average comparison and a standard deviation of behavior induce the activity and starting the activities by their own with priority access to the area).

Priority areas have access to the different levels of statistical significance with autistic children start activities by their own with factors that has no priority access to the area (M=6.54 ,SD= 2.874) and has priority access to the area [M=11.30 ,SD= 4.14; t(30.912)=-4.189, p=.000]. So with or without priority access to the area influence the starting activities by their own of the autistic children. If the environment is not a priority area makes the behavior of the activity on their own, children with autism are less environment related with priority areas.

It can be concluded that the numbers of behavior that autistic children start activities by their own will occur in the environment where the priority areas for access, and the numbers of behavior that encourage to do activities by teachers will occur if the environment is not a priority for access.

Therefore, it can be concluded that to reduce defect management dictates of autistic children, the environment should be a priority in order to access consistent with the information that environment helps autistic children to plan and decide which activities will be the next and to make it clearly defined and to make decisions and control their own behavior, to carry out activities that occur each day easier

(Khare,R.&Mullick,A.2008 cited Pilar Arnaiz Sanchez) with the guidance of such environments. This reduces defects in the administration ordered.

**Table 4.2** shows the average comparison and a standard deviation of behavior induce the activity and starting the activities by their own with priority access to the area

| Behavior | Ranking Areas to Access | Mean | SD | T | *P* Value |
|---|---|---|---|---|---|
| Convincing to start the activities | No ranking (n=26)<br>Ranking (n=20) | 14.65<br>7.50 | 3.720<br>3.017 | 7.004 | .000 |
| Starting activities by their own | No ranking (n=26)<br>Ranking (n=20) | 6.54<br>11.30 | 2.874<br>4.414 | -4.189 | .000 |

2) The use of symbols in the ranking of activities – The analysis variants link of convincing to start the activities and starting activities by their own by testing with t-test to compare the physical environmental factors whether the behavior of convincing to start the activities by the teachers and the behavior of starting activities by autistic children are different or not.

From **Table 4.3** shows the average comparison and Standard Deviation of number of behavior of convincing to start the activities and starting activities by their own with the use of symbols in the ranking of activities. It results in difference in the level of statistical significance and the behavior that teachers convincing the autistic children to start the activities in the factor that has no symbols in the ranking of activities *(M=14.65, SD= 3.720)* and has symbols in the ranking of activities *[M=7.5, SD= 3.017; t(44)=7.004, p=.000]* meaning that with or without the symbols in the ranking of activities influence the behavior of convincing to start the activities. If the environment does not have the symbols in the ranking of activities, it makes the numbers of convincing to start the activities bigger than the environment does not have the symbols in the ranking of activities (see Table 4.3 shows the average comparison and Standard Deviation of number of behavior of convincing to start the

activities and starting activities by their own with the use of symbols in the ranking of activities).

The use of symbols in the ranking of activities has difference level of statistical significance and the behavior of autistic chidren start the activities by their own in the factor that has no symbols in the ranking of activities*(M=6.54,SD= 2.874)* and has symbols in the ranking of activities *[M=11.30,SD=4.14; t(30.912)=-4.189,p=.000]* meaning that with or without the symbols in the ranking of activities influence the behavior of starting the activities by their own. If the environment does not have the symbols in the ranking of activities, it makes the numbers of starting the activities by their own smaller than the environment that has the symbols in the ranking of activities.

From the results of the analysis can be concluded that the behavior will occur more when the environment with the use of symbols in the ranking of activities, and the behavior of starting the activities by their own of the autistic children will be less when the environment without the use of symbols in the ranking of activities. The number of behavior that the teachers convince to start the activities will occur when environment without the use of symbols in the ranking of activities and will reduce when environment with the use of symbols in the ranking of activities.

Therefore, it can be concluded that to reduce defect management dictates of autistic children, the physical environment should use the symbols to show the ranking of the activities consistent with the literature found that if the environment allows autistic children to plan decide which activities will be the next by designing the symbols as the activity table to make it clearly separate in order to let the autistic children decide and control their activities that occur everyday easily (Khare,R.&Mullick,A.2008 cited Pilar Arnaiz Sanchez) with the guidance of such environments. This reduces defects in the administration ordered.

**Table 4.3** shows the average comparison and Standard Deviation of number of behavior of convincing to start the activities and starting activities by their own with the use of symbols in the ranking of activities

| Behavior | Ranking Areas to Access | Mean | SD | T | *P* Value |
|---|---|---|---|---|---|
| Convincing to start the activities | No use of symbols (n=26)<br>Use of symbols (n=20) | 14.65<br>7.50 | 3.720<br>3.017 | 7.004 | .000 |
| Starting activities by their own | No use of symbols (n=26)<br>Use of symbols (n=20) | 6.54<br>11.30 | 2.874<br>4.414 | -4.189 | .000 |

## 2. Characteristics of Defectiveness of Social Data Processing

From the research questionnaire 2.2 that stated the characteristics of physical environment and types of activities can reduce impaired processing of social information of autistic children. From the analysis of data that could explain the characteristics environmental factors associated with the defect in processing social information is related to independent variables in two issues are physical environment issues and the interaction of people in the area. It has the details as followings: the physical environment factors include space area during the activities to one autistic child and capable of flexible space. Factors include the interaction of people in the area include seat position between teacher and students and the distance between the seats of teachers to students by analyzing the relationship with the dependent variables are behavior of autistic children into three factors: behavior of moving out from the on going activities, behavior of looking at other things rather than the on going activities and behavior of walking out of the room. The result appears as followings:

1. The Physical Environment Factors

1.1. Space area during the activities to one autistic child – analysis by three behaviors are behavior of moving out from the on going activities, behavior of looking at other things rather than the on going activities and behavior of walking out of the room – is the analysis of the variance between the variables between groups to find the influence of the space activities to one autistic child (first group is 0.30 sqm., second group is 0.50 sqm., third group is 0.60 sqm., fourth group is 0.70 sqm. and fifth group is 0.90 sqm.) with the behavior of autistic children by using One way ANOVA as testing method (see table 4.4 shows the variance analysis of behavior of autistic children in difference of space activities to one autistic child)

From **Table 4.4** shows the variance analysis of behavior of autistic children in difference of space activities to one autistic child found that the difference in *p=.00* with two behaviors are behavior of moving out from the on going activities and behavior of looking to other things rather than the on going activities, but does not affect the variable behavior of walking out of the room. From the previous information shows that the space activities to one autistic child give the different affect the numbers of behavior of a move away from the on going activities and the numbers of behavior of looking to other things rather than the on going activities. Besides, the space activities to one autistic child do not give different affect the numbers of behavior of walking out of the room with the following results:

The result of the analysis of variance between groups with variable of behavior moving away from on going activities within different environment are different *[F(4,41)=9.432, p=.00.* However, the level of statistical significance has a small difference in mean within a group that need to consider using of Post-Hoc compared to using Tukey HSD to test the average value in each group and the result shows as followings:

Group 1 *(M= 4.33, SD= 6.182)* the difference at a level of statistical significance with three other groups including Group 3 *(M= 19.86, SD= 12.169)*, Group 4 *(M=2.83, SD= 3.060)* and Group 5 *(M=4.53, SD= 3.598)*. But Group 2 *(M=11.33, SD= 7.486)* is not significantly different with any group.

Variance between groups of variable in space activities to one autistic child with behavior of looking to other things rather than on going activities in different environment has the difference as followings *[F(4,41)=4.349, p=.005]*. However, the levels are also statistically significant difference of average value in the group which needed to consider using of Post-Hoc compared to using Tukey HSD to test the average value of each group. The result shows as followings:

Group 1 *(M= 8.98, SD= 6.186)* ang Group 4*(M= 19.36, SD= 8.608)* are not significantly different with any group but there are significant difference with other three groups including Group 2, 3 and 4 with the following details: Group 2 *(M= 6.00, SD= 3.426)* found a statistically significant difference with Group 4 *(M= 23.59, SD= 18.937)* and Group 4 has a different mean with Group 3 *(M= 6.19, SD= 3.273)*.

Therefore, analysis of variance One way ANOVA with the level of significance found that Size of the activities of different people has resulted in the behavior of moving out from the on going activities by considering the average number of behaviors in each group and environment variance. It was found that the area of activity per person: Group 1 is 0.30 sqm. has the average minimum is 4.33, Group 3 is 0.60 sqm. has the highest average is 19.86 , and Group 4 is 0.70 sqm. and Group 5 is 0.90 sqm. has the average as low as 2.83 and 4.53 respectively. This shows that the highest average is Group 3 with a clear difference from other groups except Group 2 with similar average is 11.33. So, the size of the area strongly affects the behavior of moving away from on going activities is size of the area per one person 0.60 sqm. means that if an autistic child doing activities in an environment that has the size 0.60 sqm. per person will create high possibility of moving away from on going

activities. If you consider the environment that makes such behavior should have a minimum area of 0.70 sqm.

Considering the environment in the area of activity per person, which affects the behavior of looking at other things rather than the on going activities when considering the behavior of the Group 2 with area of 0.50 sqm. and Group 3 with area of 0.60 sqm., found few behaviors. However, Group 5 with area of 0.90 sqm. has the highest average. These three groups have the variability between each other and affect the behavior of a small area of 0.90 sqm. per person give the high effect to the occur of behavior of looking at other things rather than on going activities. Therefore, to reduce such behavior should be considered in the activity area of approximately 0.50 sqm. per person, which causes such behavior less than other areas.

Therefore, when the autistic children do activities in the environment where the space for one person is 0.70 sqm. will cause less behavior of moving away from the on going activities. If an area of approximately 0.50 sqm. will cause less behavior of looking to other things during the activities as well.

The research supported the area of activities which states that the size of a classroom of autistic children are involved in processing sensory information and perceived stimuli impaired. Classrooms that are too small can cause discomfort, affect the behavior of children. Classrooms that are too big may make children feel confused because they do not know how to engage in the classroom activities (Phadung Arayavinnu 2003, page 34). Space-based activities should be wide enough for a child to adjust their behavior accordingly to help create benefits in different training (Beaver,C.2010 and Ian Scott 2009 and Richer,J.M. & Nicoll,S.1971)

**Table 4.4** shows the variance analysis of behavior of autistic children in difference of space activities to one autistic child

| Behavior | Source of Variance | Sum of Squares | df | Mean Square | F | *p* value |
|---|---|---|---|---|---|---|
| Moving out of the on going activities | Between the groups | 1454.592 | 4 | 363.648 | 9.432 | .000 |
| | Within the group | 1580.764 | 41 | 38.555 | | |
| | Total | 3035.356 | 45 | | | |
| Looking at other things besides the activities | Between the groups | 2594.510 | 4 | 648.627 | 4.349 | .005 |
| | Within the group | 6115.252 | 41 | 149.152 | | |
| | Total | 8709.761 | 45 | | | |

### 1.2.Capable of Flexible Space

The ability to be flexible is the analyzing the relationship between the independent variables about the ability of flexible space (no flexibility of use and has flexibility to operate in the area) with the behavior of autistic children by using T-test.

(There is no usage flexibility and there is flexibility of usage in the area). The behavioral expression of the autistic children by using T-test statistic to test, the result shows that there is statistical significant difference of moving behavior from their doing activity and behavior of looking at other things besides their doing activities. But there is no impact of the variable behavior of walking out of the room. The details as following:

From Table 4.5 shows a comparison of Mean and Standard deviation of the number of behavioral expression of autistic children with the ability of area flexibility showing the relationship of the ability of area flexibility with the behavior of moving out from the doing activities. There is statistical significant difference if there is no usage flexibility in the area (M=11.44, SD=10.476) and if there is usage flexibility in the area [M=3.81, SD=3.425; t(22.138)=3.128, p=.005].

And behavior of looking at other things there is significant statistical difference with the capacity of area flexibility when there is no usage flexibility in the area (M=7.10, SD=4.540) and if there is usage flexibility in the area [M=21.8, SD=15.330; t(30.505)= -4.633, p=.000].

Thus, the ability of the area usage flexibility impacts to the behavior of moving out from the doing activity and the behavior of looking at other things rather than the doing activity with statistical significant difference if within the area able to resilient will make the number of behaviors moving out from doing activity less than the area which there is no resilient. But on the contrary, if the area able to be flexible, it will make the behavior of looking at other things rather than the doing activity more than the inflexible area.

Therefore, if needs the children having the behavior moving away from the doing activity getting reduction, there should be prepare a flexible area according to the usage types. But if wants to reduce the behavior looking at other things besides its doing activity of the children, it should be create the fixed environment. The issue links to the research which mentioned "there should be arrange the flexible and adaptable area base on the activity characteristic by using both small-sized and large-sized area owing to the occurrence activities. And the autistic children will learn better in the environment which already organized." (Lorma Wing, 184 references to วัลลภัตม์ โคตะนันท์ 2003), (Beaver, C.2010 and Ian Scott 2009 and Richer, J.M. & Nicoll, S.1971) and (Khare, R. &Mullick, A.2008 and Vogel. 2008 references to Pilar Arnaiz Sanchez).

**Table 4.5** shows Mean and Standard deviation comparison of number of behavioral expression of autistic children with the capability of flexible area.

| Behaviors | Capability of flexible area | Mean | Standard Deviation (SD) | t | P value |
|---|---|---|---|---|---|
| Moving out from the existing activities. | Unable (n=20)<br>Able (n=26) | 11.44<br>3.81 | 10.476<br>3.425 | 3.128 | .005 |
| Looking at other things rather than the existing activities. | Unable (n=20)<br>Able (n=26) | 7.10<br>21.80 | 4.540<br>15.330 | -4.633 | .000 |

**2. The interaction factors of the local people**

**2.1) Sitting position between teacher and student**

The relationship analysis of sitting position between teacher and student while doing the activity divided as 1) Group activity and 2) Individual activity by using statistical T-test testing to compare the internal factor of sitting between teacher and student the while doing the activity with the variance of behavioral expression of autistic children such as behavior of moving away from the existing activities, behavior of watching other things beside the existing activity, and behavior of walking out of the classroom. The details as following:

1) Sitting position between teacher and student in group activities

From table 4.6 shows Mean and Standard deviation comparison of number of behavioral expression of autistic children with sitting position of teacher and student while doing group activities. The analysis result is the sitting position between teacher and student in group activity impacts to the behavior of moving away from the doing activity only one behavior. As the result shown that there is significant statistical difference in sitting next to each other (M=8.48, SD=8.87) and sitting opposite [M=2.83, SD=3.0660; t(43.445)=3.207, p=.003]. But there is no effects to the variance behavior of looking at other things rather than the doing activity and

behavior of walking-out of the classroom (Table 4.6 shows Mean and Standard deviation comparison of number of behavioral expression of autistic children with sitting position between teacher and student while doing group activities).

Therefore, the sitting position between teacher and student in group activity both sitting next to each other or sitting opposite affects the behavior of moving away from the doing activity with statistical significant difference. But there is no effect to behavior of watching other things beside the existing activity and behavior of walking out of the classroom. If there is group activity and organize to sit next to each other between teacher and student, it will cause the behavior moving away from the existing activity more than sitting opposite.

In order to make a high efficiency of group activity it should be organize to sit opposite to reduce the behavior of moving away from the doing activity of autistic children. Moreover, the sitting position between teacher and student who sit opposite helping teacher able to control the student's behavior to make interaction consistently. It helps children to concentrate with teacher and activity and not being distraction with other things. Hence, อุมาพร ตรังคสมบัติ (2002) mentioned "Sitting position in the classroom helps to create interaction and efficiencies with students. It considers from the specific characteristic of the children, unable to stay still personality, thus sitting position among each other impacts to behavior control.

**Table 4.6** shows Mean and Standard deviation comparison of number of behavioral expression of autistic children with sitting position between teacher and student while doing group activities.

| Behavior | Sitting position between teacher and student while doing group activities | Mean | Standard Deviation (SD) | t | P value |
|---|---|---|---|---|---|
| Moving out from the doing activities. | Sitting side by side (n=35)<br>Sitting opposite (n=11) | 8.48<br>2.83 | 8.87<br>3.06 | 3.207 | .003 |

2) Sitting position between teacher and student in individual activities

The issue of sitting position between teacher and student in individual activity is the relationship analysis of sitting position between teacher and student in individual activity (Sitting freeform and sitting opposite) with the number of 3 occurred behaviors.

From table 4.7 shows Mean and Standard deviation comparison of number of behavioral expression of autistic children with sitting position between teacher and student while doing individual activities. The analysis results the sitting position between teacher and student in individual activity impacts to the behavior of moving away from the doing activity because of there is statistical significant difference of sitting freely (M=111.44, SD=10.476) and sitting opposite [M=3.81, SD=3.425; t(22.138)=3.128, p=.005] and it impacts to behavioral variance of looking other things rather than the existing activity with significant statistical difference of sitting freely (M=7.10, SD=4.54), and sitting opposite [M=21.80, SD=15.330; t(30.505)=-4.633, p=.000]. But there is no impact to behavioral variance of walking out of classroom (Table 4.7 shows Mean and Standard deviation comparison of number of behavioral expression of autistic children with the sitting position between teacher and student while doing individual activities). The sitting position between teacher and student in group activity impacts to causing the number of behavior of moving away from the existing activity and the number of behavior of watching other things rather than its doing activity differently but the sitting position between teacher and student in group activity affects the number of behavior of walking out of classroom there is no difference.

Therefore, sitting position between teacher and student in individual activity both sitting freely and sitting opposite affects the behavior of moving away from the existing activity and behavior of looking at other things besides its doing activity with level of statistical significance. But there is no affect behavior of walking out of

classroom if there is individual activity and allow the children to have a seat freely without teacher. It will make the behavior of moving away from doing activity much more than teacher sits on the opposite side. But in contrary if the children sit freely will make behavior of looking at other stuff besides its existing activity less than the sitting on the opposite side of teacher.

**Table 4.7** shows Mean and Standard deviation comparison of number of behavioral expression of autistic children with sitting position between teacher and student while doing individual activities.

| Behaviors | Sitting position between teacher and student while doing individual activities | Mean | Standard Deviation (SD) | t | P value |
|---|---|---|---|---|---|
| Moving out from the existing activities. | Sitting freely (n=20)<br>Sitting opposite (n=26) | 7.10<br>21.80 | 4.54<br>15.33 | 3.128 | .005 |
| Looking at other stuff beside doing activities | Sitting freely (n=20)<br>Sitting opposite (n=26) | 7.10<br>21.80 | 4.540<br>15.330 | -4.633 | .000 |

### 2.2) Sitting distance between teacher and student

Environmental factor of sitting distance between teacher and student divided into 3 characteristic activities such as 1) Sitting distance between teacher and student in group activities, 2) Sitting distance between teacher and student in individual activities, and 3) Sitting distance between teacher and student in front of whiteboard activities.

1) Sitting distance between teacher and student in group activities

The issue of sitting distance between teacher and student in group activity is the analysis to find out the relationship of variable independent is the sitting distance between teacher and student in group activity whether it affects the

behavioral expression of autistic children or not by using statistic One Way ANOVA to test. So, the variable analysis between group (1st group: 0.00 – 0.30 meter, 2nd group: 0.31 – 0.60 meter, 3rd group: 0.61 – 0.90 meter, 4th group: 1.21 – 1.50 meters).

From table 4.8 shows the variable analysis of behavioral expression of autistic children in differentiation of sitting distance of teacher and student in group activity. The relationship result between variable sitting distance of teacher and student in group activity influences only one variance is the behavior of moving away from doing activity. So, it found that there was significant statistical difference which p=.021 in each environmental factor. It has different value as follow [F(3,42)=3.604, p=.021]. However, the level of statistical significance still has slightly Mean difference within the group by using Post-Hoc to compare using Key HSD testing to find out the Mean in each group. It results as below:

Group 1 (M=5.25, SD=3.796) there is no significant difference with other group, and Group 2 (M=4.33, SD=6.182) there is no significant difference with other group either, but Group 3 (M=11.22, SD=10.235) there is level of statistical significant difference with Group 4 (M=11.22, SD=10.235) (Table 4.9 shows the variable analysis of behavioral expression of autistic children in differentiation of sitting distance of teacher and student in group activities).

From the researching result shows that sitting distance between teacher and student in group activity impacts to have the number of behavior of looking at other things rather than doing activity and behavior of walking out of classroom there is no difference.

Therefore, environmental interaction with the internal people in the area of sitting distance of teacher and student in group activity affects the behavior of moving out from the existing activity which is different at range 0.61-0.90 meter with range 1.21-1.50 meters. There is a level of statistical significance p=.05 and when it considers Mean of group which has range 0.61-0.90 meter found that there was Mean

of behavioral expression of moving-out behavior from doing activity with the highest 11.22 times. Group 4 has range 1.21-1.50 meters with Mean of behavioral expression of the aforementioned behavior only 2.83 times. Therefore, if wants to reduce the behavior of moving out from doing activity while doing group activities, it should be have sitting range between teacher and student at 1.21-1.50 meters because it results the lowest rate of behavior of moving out from the group activity of autistic children.

**Table 4.8** shows the variable analysis of expression behavior of autistic children in the differentiation of sitting distance between teacher and student in group activities.

| Behaviors | Source of Variance | Sum of Squares | df | Mean Square | F | P value |
|---|---|---|---|---|---|---|
| Moving out from the existing activities. | Between group | 621.366 | 3 | 207.122 | 3.604 | .021 |
| | Within group | 2413.990 | 42 | 57.476 | | |
| | Total | 3035.356 | 45 | | | |

2) Sitting distance between teacher and student in individual activities

The analysis to find out the relationship of variable independent is sitting distance between teacher and student in individual activity whether there is influence to behavioral expression of autistic children or not. Using statistical T-test to test and analyze to compare the internal factor of variance within each group (First Group is sitting freely without teacher and 2nd Group sitting with range 0.00-0.30 meter)

From Table 4.9 shows Mean and Standard deviation comparison of number of behavioral expression of autistic children with distance range between teacher and student while doing individual activities. The relationship results between variable range of sitting distance between teacher and student in individual activities. It influents to 2 variances are the behavior of moving out from existing activity and the

behavior of looking at other things beside the existing activity which found that there was statistical significant difference. It has details as following:

Behavior of moving out from the existing activity has different value with sitting freely (M=11.44, SD=10.476) and sitting range at 0.00-0.30 meter [M=3.81, SD=3.425; t(22.138)=3.128, p=.005].

Behavior of watching other things else besides existing activity has different value with sitting freely (M=7.10, SD=4.540) and sitting range at 0.00-0.30 meter [M=21.80, SD=15.330; t(30.50)=-4.633, p=.000] (Table 4.10 shows Mean and Standard deviation comparison of number of behavioral expression of autistic children with range of distance between teacher and student while doing individual activities).

The researching result shows that sitting distance between teacher and student in individual activity influences to the number of moving-out behavior from the existing activity and the number of behavior looking at other things beside the existing activity differently. But it influences there is no difference to the number of behavior walking out from the classroom.

Therefore, sitting distance between teacher and student in individual activity both sitting freely and sitting range at 0.00-0.30 meter. It affects the behavior of moving out from doing activity and behavior of watching other things rather than existing activity with the level of statistical significance. But it does not have any impact to the behavior of walking out from the classroom if there is individual activity and allows the children to sit freely without teacher sitting there. It will make the behavior moving out from the existing activity more than sitting with range of distance at 0.00-0.30 meter. But in the opposite if children allows to sit freely, it will make children has less behavior of watching other things besides its doing activity than sitting with range of distance at 0.00-0.30 meter.

So, if needs to reduce the behavior of moving out from the existing activity, it should be organize the children to sit with teacher at range of 0.00-0.30 meter. And if

needs to reduce the behavior of watching other things besides doing activity, it should be organizing children to sit freely. Because it easily to control the behavior to make interaction consistently. It helps children to concentrate with teacher and activity and does not distraction with other things. อุมาพร ตรังคสมบัติ (2002) mentioned "Sitting position in the classroom helps to create interaction and efficiency to the students considering from specifically characteristic of the children that cannot stay still, so sitting position between each other influencing to behavior control."

**Table 4.9** shows Mean and Standard deviation comparison of number of behavioral expression of autistic children with range of distance between teacher and student while doing individual activities.

| Behaviors | Sitting range of teacher and student while doing individual activities | Mean | Standard Deviation (SD) | t | P value |
|---|---|---|---|---|---|
| Moving out from the existing activities. | Sitting freely (n=20)<br>0.001-0.30m (n=26) | 11.44<br>3.81 | 10.476<br>3.425 | 3.128 | .005 |
| Looking at other things beside doing activities | Sitting freely (n=20)<br>0.001-0.30m (n=26) | 7.10<br>21.80 | 4.540<br>15.330 | -4.633 | .000 |

3) Sitting distance of teacher and student in front of whiteboard activities

The analysis to find out the relationship of variable independent is sitting distance of teacher and student in front of whiteboard activity whether it influences to behavioral expression of autistic children or not by using statistic t-test to testing and analyze the comparison of internal factor variance in each group (Group 1: sitting with range of distance at 0.91-1.20 and Group 2: sitting with range of distance at 1.21-1.50 meters).

From table 4.10 shows Mean and Standard deviation comparison of number of behavior expression of autistic children with distance range of teacher and student in front of whiteboard activities. The relationship results the variance of sitting distance of teacher and student in group activity influences to 2 variances are the behavior of moving out from its doing activity and the behavior of watching other things besides its existing activity. So, it found that there was statistical significant difference. The details as following:

Behavior of moving out from its doing activity has value difference with sitting range at 0.91-1.20 (M=11.44, SD=10.476) and sitting range at 1.21-1.50 meters [M=3.81, SD=3.425; t (22.138)=3.128, p=.005].

Behavior of looking at other things besides its existing activity has value difference in sitting range of distance 0.91-1.20 (M=7.10, SD=4.540) and sitting range at 1.21-1.50 meters [M=21.80, SD=15.330; t(30.50)=-4.633, p=.000] (Table 4.11 shows Mean and Standard deviation comparison of number of behavioral expression of autistic children with sitting distance of teacher and student in front of whiteboard activities).

From researching result shows that sitting distance of teacher and student in front of whiteboard activity impacts to the number of behavior occurrence of moving out from the existing activity and number of behavior occurrence of looking at other things besides its doing activity differently. But it affects there is no difference to the number of behavior occurrence of walking out of classroom.

Therefore, sitting distance between teacher and student in front whiteboard activity both range of distance at 0.91-1.20 meters and the range at 1.21-1.50 meters impacts to the behavior of moving out from the existing activity and the behavior of watching at other things instead of doing activity with level of statistical significant. But there is no impact to the behavior of walking out of classroom if there is activity in front of the whiteboard. And allows the children to sit away from teacher with

range of distance at 0.91-1.20 meters it causes the behavior of moving out from the existing activity more than sitting with range of distance at 1.21-1.50 meters. But on the contrary if the sitting distance of children away from their teacher at range of 0.91-1.20 meters, it will make the number of behavior of looking at other things instead its existing activity less than sitting distance at range of 1.21-1.50 meters.

Therefore, the sitting distance between teacher and student in front of whiteboard activity should be organize the children to sit with their teacher at range of 1.21-1.50 meters to reduce the behavior of moving out from the existing activity. But if wants to reduce the behavioral number of looking at other things instead of doing activity should be have sitting distance at range of 0.91-1.20 meters because of the ability to control behavior causing interaction consistently. It helps children to concentrate with teacher and activity and does not causing any distraction. อุมาพร ตรังคสมบัติ (2002) had mentioned "Sitting position in the classroom helps to create interaction and efficiency to the students considering from specifically characteristic of the children that cannot stay still, so sitting position between each other influencing to behavior control."

**Table 4.10** shows Mean and Standard deviation comparison of number of behavioral expression of autistic children with sitting range of teacher and student in front of whiteboard activities.

| Behaviors | Sitting range of teacher and student while doing activity in front of whiteboard | Mean | Standard Deviation (SD) | t | P value |
|---|---|---|---|---|---|
| Moving out from the existing activities. | 0.91-1.20 (n=20)<br>1.21-1.50 (n=26) | 11.44<br>3.81 | 10.476<br>3.425 | 3.128 | .005 |
| Looking at other things instead of doing activities | 0.91-1.20 (n=20)<br>1.21-1.50 (n=26) | 7.10<br>21.80 | 4.540<br>15.330 | -4.633 | .000 |

### 3. The impairment characteristic of processing sensory information, perception of stimulus, and learning of impairment

From the researching sub-questions number 3 what is an environmental characteristic that able to reduce the impairment of processing sensory information, perception of stimulus, and learning of impairment of those autistic children? In data analysis requires to describe the impairment characteristic of processing sensory information, perception of stimulus, and learning of impairment has divided into 2 types are perceiving stimulus visual impairment and perceiving stimulus audio impairment. So, there is relation experiment of variable independent likely the characteristic of environmental physical factor. The details as follow:

3.1 Perceiving stimulus visual impairment: analyze to find out the relation from 1) The complexity of classroom decoration with the picture does not relate to study at visual level, 2) Classroom decoration with hanging stuff, 3) Sitting distance from the windows, 4) Sitting distance from the doors, 5) Hole-opened size at the visual level, 6) Proportion of hole-opened size at visual level to the room size, 7) Visible items outer of hole-opened size, 8) Distance range from the storage area, and 9) Characteristic of the area division

3.2 Perceiving stimulus audio impairment: analyze to find out the relation from 1) Distance range between classroom and other classrooms, 2) Distance characteristics of classroom and other classrooms, 3) Corridor characteristics outside the classroom, and 4) Audio device usage in the classroom. It shows relating data as below:

#### 3.1 Perceiving stimulus visually impairment

1) The complexity of classroom decoration with the picture does not relate to study at visual level

The analysis to seek out the relationship between the complexity of classroom decoration with picture which does not relate to study at visual level and

behavioral expression of autistic children of those 3 formats using statistical One way ANOVA to test which is the variable analysis between group (Group 1: No complicated, Group 2: Less complicated, Group 3: Moderate complicated, Group 4: Very complicated)

From table 4.11 shows variable analysis of behavioral expression of autistic children in differentiation of classroom decorating complexity with picture unrelate to study at visual level. The relationship result between variable complexity of classroom decoration with unrelated picture to study at visual level influences 2 variances are the behavior of moving out from the existing activity and the behavior of looking at other things instead of its doing activity. Therefore, it found that there was statistical significant difference at p=.05. However, in each environmental factor has level of statistical significance it actually makes a slightly difference in Mean within group. It has to use Post-Hoc to compare of using Key HSD to test the Mean in each group. It has details as follow:

The behavior of moving out from existing activity different at [F(3,42)=12.553, p =.000]. It has Mean differentiation between Group 1 and Group 4, and Group 1 and Group 4 as follow: Group 1 (M=11.33, SD=7.486), Group 2 (M=19.86,SD=12.169). Both groups different from Group 4 (M=3.85, SD=3.509). But Group 3 (M=4.02, SD=4.821) there is no significant difference with any other groups. (Table 4.12 shows variable analysis of behavioral expression of autistic children in differentiation of classroom decorating complexity with picture does not relate to study at visual level).

Therefore, environmental complexity of classroom decoration with picture unrelated to study in visual level is the difference between non complicated and very complicated, and less complicated and very complicated which impacts to the behavior of moving out from its doing activity with level of statistical significant at p=.011. Uncomplicated picture causes mean of behavior getting high when compared to use very complicated picture and less-complicated picture. When

comparing very complicated picture it affects more to the number of behavior moving out from the existing activity of autistic children.

The behavior of looking at other things instead of its doing activity different from environmental complexity of classroom decoration with pictures does not relate to study at visual level. It different at [F(3,42)=4.204, p =.011]. It has Mean different between Group 1 and Group 3, and Group 2 and Group 3. Therefore, Group 1 (M=6, SD=3.426), Group 2 (M=6.19, SD=3.273). Both groups have level of statistical significant difference with Group 3 (M=23.32, SD=20.411), Group 4 (M=15.96, SD=8.022) has no significant difference with any group (Table 4.12 shows variable analysis of behavioral expression of autistic children in differentiation of classroom decorating complexity with pictures do not relate to study at visual level).

Consequently, environmental complexity of classroom decoration with picture unrelated to study in visual level is the difference between no-complicated and moderate complicated, and less complicated and moderate complicated which impacts to the behavior of looking at other things besides its doing activity with level of statistical significant at p=.05. It means that moderate complicated impacts to causing more number of behaviors of watching at other things instead of existing activity when it compares with no-complicated at all and less complicated. It means that complexity of classroom decoration with picture unrelated to study in visual level affects the number of behavior of looking at other things instead of existing activity differently. But it affects nothing difference to the number of behavior of moving out from the existing activity.

Hence, environmental design has level of complexity of classroom decoration with picture unrelated to study in visual level affects the behavior. So, if wants to create an environment to reduce causing behavior of moving out from existing activity of autistic children, it should be organize the complicated level of the picture with high complexity. But if wants to reducing the behavior of looking at other things

instead of existing activity, it should be creating environment with less complexity or no complexity. Environmental design to reduce the behavior of looking at other things consistent with the article said "The design should be using details and choosing an appropriate material, creating a simple. The wall should be smooth it has no hanging stuff or cartoon picture on the wall, except tutoring pictures. Unless, using details to decorate the environment for tutoring purpose in particular, this will avoid creating unnecessary stimulus to the children (อุมาพร ตรังคสมบัติ 2002).

**Table 4.11** shows variable analysis of behavioral expression of autistic children in differentiation of classroom decorating complexity with picture does not relate to study at visual level.

| Behaviors | Source of Variance | Sum of Squares | df | Mean Square | F | P value |
|---|---|---|---|---|---|---|
| Moving out from the existing activities. | Between group | 1434.987 | 3 | 478.329 | 12.553 | .000 |
| | Within group | 1600.369 | 42 | 38.104 | | |
| | Together | 3035.356 | 45 | | | |
| The behaviors to look at other thing out of the activities currently doing | Between groups | 2011.332 | 3 | 670.444 | 4.204 | .011 |
| | Within groups | 6698.429 | 42 | 159.486 | | |
| | Together | 8709.761 | 45 | | | |

2) The classroom decoration with hanging

The analysis of the relationship between independent variables is the classroom decoration with hanging which show that it influence the behavior of autistic children by using statistical t-test is a test, a comparative analysis of the variables within each group (The first group is the group without hanging and the second thing is the group with hanging).

Figure 4.12 shows a comparison of the mean and standard deviation of the behavior of autistic children. The classroom is decorated with hanging, and the analysis of the relationship between variables classroom decorated with hanging that

influence the behavior of the two dependant variables move away from activities that do exist and the behavior of looking for other activities. It was found that the differences are statistically significant. The classroom is decorated with hanging affect the behavior of a move away from activities that do exist and a number of behaviors of looking for other activities. They are very different but have an effect on the behavior of walking out of the room which is not different. The details are as following:

Moving out of the habit of doing things: The difference in case no hanging (M = 11.45, SD = 9.77), and if there is something hanging. [M = 3.5, SD = 4.105; t (25.9) = 3.5, p = .002].

Behaviors to look at what other activities do: The difference, if no hanging. (M = 8.06, SD = 4.31), and if there is something hanging. [M = 21.58, SD = 16.14; t (28) = -4.02, p = .000] (See Figure 4.13 Shows a comparison of the mean and standard deviation of the behavior of autistic children, the classroom is decorated with hanging).

Therefore, the environments with or without hanging have an impact on the mobile habits of doing things, and behavior and look at other activities with high statistical significance. If there is nothing hanging, it will cause the mobile habits of activity over the environment with things hanging. On the other hand, the environments are all suspended. Then it will cause the behavior to look at what other things do not have anything hanging over the area.

Therefore, if you want to lose the behavior of moving out of the activities of autistic children, the environment should be designed to have something hanging and reduce behavior of looking for other activities. There should be no hanging things in the environment because of the lack of hanging. it will avoid the creation of unnecessary provocation to children (Display Mode Trang's treasure in 2545.

**Figure 4.12** shows a comparison of the mean and standard deviation of the behavior of autistic children. The classroom is decorated with hanging.

| Behavior | Decorated with hanging | Mean | Standard Diviation (SD) | t | *p* value |
|---|---|---|---|---|---|
| The move away from activities that do exist. | Don't have (n=21)<br>Have (n=25) | 11.45<br>3.50 | 9.770<br>4.105 | 3.480 | .002 |
| To look for other activities | Don't have (n=21)<br>Have (n=25) | 8.06<br>21.58 | 4.307<br>16.142 | -4.020 | .000 |

3) The distance of the seat from the window

The relationship analysis of the distance between windows and seats: The behavior of autistic children are three formats that use statistics One way ANOVA. One way ANOVA is a test which analyzes the variables between groups (group spacing of 2.6 m 2 group spacing of 3.2 meters and a third term up to 3.3 meters)

Figure 4 . 13 shows the variance of the behavior of autistic children in the different distance from the window to seat area. The relationship between variables of the distance from the window to seat area influence on only one variable which is the behaviors of looking for other activitie. It was found that the difference was statistically significant at p = .007 in each and any factor environment. The level of statistical significance like this will cause the difference of the average within the group by using a Post-Hoc Key HSD test to compare with the different average in each group [F (2,43) = 5.63, p = .007], with an average difference between the two groups with three groups as follows: Group 2 (M = 21.41, SD = 16.662) Group 3 (M = 8.81. , SD = 4.54), but group 1 (M = 8.98, SD = 6.19) did not differ significantly on any group (see Figure 4.14 shows variance analysis of the behavior of autistic children in the difference in the distance from the window to seat area) refers to the distance from the window to seat chair which will affect a number of behaviors to look for other activities differently. However, it also has an effect on the number of behavior

of walking away from activities that do exist and the habit of walking out of the room undifferently.

Therefore, the distance from the window to seat area: the difference between 3.2 to 3.3 meters, with effects on the behaviors to look for other activities. The level of statistical significance p = .007 considering the average of each group found. The space between the window to seat area at a distance of 3.2 meters, causing the average number of behaviors to look at what other activities are on average 21.41 times greater than the distance between the seats with 3.3 meters long, with an average 8.81 times.

The distance from the window to seat area: It influences the behavior of looking for other activities. If needing to reduce such behavior, the seats should be arranged at a distance of 3.3 meters from the windows.

The distance of the seat and window are related by the article above. The appropriate seating management for autistic children that allows children to distraction is the sitting as far from the windows or sitting around in front of the teacher, classroom design to interference from others as little as possible, and does not make them feel threatened. The environment should not contain elements that are visible to the hearing or exposure to noise of children. In addition to distracting things prepared for practice in the classroom. Otherwise, the symptoms are impaired concentration and learning problems are not. (Beaver, C.2010 and Ian Scott2009 and Richer, J.M. & Nicoll, S.1971 and Vogel.2008 cited in Pilar Arnaiz Sanchez) (Continuation civilized scholar in 2546).

**Figure 4.13** shows the variance of the behavior of autistic children in the different distance from the window and seat area.

| Behavoir | Variance | Sum of Squares | df | Mean Square | F | *p* value |
|---|---|---|---|---|---|---|
| To look for other activities | Among Group | 1806.857 | 2 | 903.429 | 5.628 | .007 |
| | Within Group | 6902.904 | 43 | 160.533 | | |
| | Together | 8709.761 | 45 | | | |

4) The distance of the seat from the door

The analysis of the relationship between the distances of the seat from the door: The behavior of autistic children are three formats that use statistics One way ANOVA. One way ANOVA is a test which analyzes the variables between the groups (the first distance 3.5 meters at two spaced 4 meters and a third term up to 5.2 meters).

The relationship between the distance of the seat from the door: It is influenced by two variables which are the moving out of the habit of doing things, behavior and look for activities to do, but does not affect the variable behavior of walking out of the room. The details are as following:

The behavior of moving from the progresive activities: There is a difference [F (2, 43) = 4.12, p = .023] with a level of statistical significance p = .05, but it does not appear that there is a difference between the groups. It means that there is little difference in the group if you consider the average found. The behavior of moving from the progresive activities are least than 3.17 times out of 4.0 m and an average behavior such high 11.33 times the distance of 5.2 meters, and the average number of behaviors to look for other activities are 26.5 was the highest when the seat away from the door, 4 meters long and takes the average minimum is six times the distance of 5.2 meters.

The behaviors of look for other activities to do: The difference was statistically significant at p = .00 in the environment and analyzed the differences within the group using the Post-Hoc Key HSD test to compare with the average in each group. The difference [F (2,43) = 15.69, p = .000], and there are differences between the two groups, with Group 1 and Group 2 to Group 3 as group 2 (M = 26.48, SD =. 16.23) differs from group 1 (M = 9.06, SD = 4.93), and unlike the group 3 (M = 6, SD = 3.43) (see table 4.15. The analysis of variance showed the behavior of autistic children in the different distance from the seat door) means that the distance of the seat from the door affect the behavior of walking away from activities that do exist and a number of behaviors to look for other activities are very different, but have an effect on the behavior of walking out of the room undifferently.

Thus, the distance of seat from door are affecting the movement of activities to do, behavior, and look for activities to do. Therefore, to reduce the number of behavior moving away from activities that does exist. They should have to sit at a distance of 4 meters away from windows and to reduce the number of behaviors to look for other activities to do. They should be a long ride away from the window at a distance of 5.2 meters.

The distance between the seat and the door is relevant because, as the article above. The appropriate seating for autistic children to allows children to distraction are the sitting as far from the windows or sitting around in front of the teacher and classroom design to interference from others as little as possible, and not make them feel threatened. The environment should not contain elements that are visible to the hearing or exposure to noise of children. In addition to distracting things prepared for practice in the classroom. Otherwise, the symptoms are impaired concentration and learning problems are not. (Beaver, C.2010 and Ian Scott2009 and Richer, J.M. & Nicoll, S.1 9 7 1 and Vogel.2 0 0 8 cited in Pilar Arnaiz Sanchez) (Continuation civilized scholar in 2546).

**Table 4.14** shows the variance of the behavior of autistic children in the different distance from the seat door.

| Behavior | Variances | Sum of Squares | df | Mean Square | F | *p* value |
|---|---|---|---|---|---|---|
| The moving out from activities that do exist. | Among group | 487.687 | 2 | 243.844 | 4.116 | .023 |
| | Within group | 2547.669 | 43 | 59.248 | | |
| | Together | 3035.356 | 45 | | | |
| To look for other activities do. | Among group | 3674.194 | 2 | 1837.097 | 15.687 | .000 |
| | Within group | 5035.568 | 43 | 117.106 | | |
| | Total | 8709.761 | 45 | | | |

5) The sizes of openings at eye level

The correlating the Sizes of the openings at eye level: The behavior of autistic children was tested using One way ANOVA statistical analysis, the variables between groups (2.0-2.5 m Sizes of the first group, second group Sizes 3.5-4.0 m. 3 distance 4.5-5.0 m 6.5-7.0 m Sizes at four groups of five Sizes from 8.5 to 9.0 m and a Sizes 6 from 11.00 to 11.5 m).

Table 4.15 shows the variance of the behavior of autistic children in different areas, the size of the openings at eye level, the relationship between the size of the openings at eye level which influenced by two variables. They are the mobile habits of behavior and look for other activities to do. The difference was statistically significant at p = .00. However, there are differences within the group that requires little to compare with the Post-Hoc Key HSD test showed the average in each group. The differences are as the following:

The mobile behavoir of doing things has the difference [F (5, 40) = 7.45, p = .000], and there are differences between sixth group with 2-5 groups as follows: Group A 6 (M = 37.67, SD = 19.60) from different groups at 2 (M = 6.19, SD = 3.27) differs from group 3 (M = 11.27, SD = 4.04) differs from group 4 (M = 19.36, SD = 8.61), and differs from group 5 (M. = 8.98, SD = 6.19), but group 1 (M = 6, SD = 3.43) did not differ from any group (See Figure 4.16 shows variance analysis of the behavior of autistic children is differences. The size of the openings at eye level) means a window at eye level affect the behavior of walking away from activities that do exist, and a number of behaviors to look at what other activities are very different. However, they have an effect on the behavior of walking out of the room undifferently.

As the size of the openings in the eye, it is affecting the mobile behavior of doing things, behavior and look for other activities to do. The level of statistical significance p = .01, and considering the average size of each group to find openings 3.5-4.0 m behavior moving away from activities that do more than any other group is 19.86 times. The behavior minimum size is 6.5-7.0 m, which is the behavior of just 2.83 times. The size of the openings in the eye causes behavior of looking for other activities are of the highest magnitude is 11:00 to 11:50 m, with an average of 37.67

times compared to other openings and 2:00 to 2:50 sq.m causes number behavioral least six times.

Therefore, the size of the openings in the eye is affecting the movement of activities, behavior and look for other activities to do. Therefore, to reduce the number of behavior moving away from activities that do exist, they should make environment at the size of the openings at eye level from 6.50 to 7.0 m and to reduce the number of behaviors to look at what other activities do. The environment should be at eye level with the size of openings at 2.0-2.5 m size of openings in the eye that affects a child's concentration, as uphold civilized scholar in 2546, has said that the environment of the classroom door. There will be too many kids would walk out of the room. The windows are too many kids distracting, because autistic children will often look toward the window.

**Table 4.15** shows the variance of the behavior of autistic children in different areas. The size of the openings at eye level.

| Behavior | Variances | Sum of Squares | df | Mean Square | F | *p* value |
|---|---|---|---|---|---|---|
| The moving out from activities that do exist. | Among group | 1463.397 | 5 | 292.679 | 7.448 | .000 |
| | Within group | 1571.959 | 40 | 39.299 | | |
| | Together | 3035.356 | 45 | | | |
| To look for other activities to do. | Among group | 5195.673 | 5 | 1039.135 | 11.828 | .000 |
| | Within group | 3514.089 | 40 | 87.852 | | |
| | Together | 8709.761 | 45 | | | |

6) Proportion to the size opening at eye level

The correlating the ratio of openings at eye level for the size: The behavior of children with autism statistics One way ANOVA is a test which analyzes the variables between the groups (the first group accounted for 3 percent of the 2 percent to 4 groups of 3 percent six groups of four ratio. 10 percent of the 5 percent to 6 percent and 11 to 16).

Table 4.16 shows the variance of the behavior of autistic children in different areas. Proportion to the size opening at eye level and the relationship between the proportions of variable openings at eye level influenced by two variables are the movemwnent of behavior and activity is to look for other activities to do. The difference was statistically significant at p = .00 However, there are differences within the group that requires little to compare with the Post-Hoc Key HSD test showed the average each group. The differences are as following:

The mobile behavior of doing things is the difference [F (5,40) = 7.45, p = .000], and there are differences between the two groups, with Group A following a 3-6 Group 2 (M = 19.86, SD = 12.17) from different groups. at 3 (M = 5.25, SD = 3.79) differs from group 4 (M = 2.83, SD = 3.06) differs from group 5 (M = 4.33, SD = 6.18), and unlike the group that 6 (M. = 3.71, SD = 3.45), but group 1 (M = 11.33, SD = 7.47) did not differ from any group yet.

The behaviors to look for other activities to do is difference [F (5,40) = 11.83, p = .000, and there are differences between the groups at six with 1-5 groups as follows: Group A 6 (M = 37.67, SD = 19.60) differs from that group. 1 (M = 6.0, SD = 3.42) differs from group 2 (M = 6.19, SD = 3.27) differs from group 3 (M = 11.27, SD = 4.04) differs from group 4 (M = 19.36. , SD = 8.61), and unlike the group 5 (M = 8.98, SD = 6.19) (see table 4.17 shows the variance of the behavior of children with autism in different areas. The openings are in proportion to the size of the eye).

The openings in proportion to the size of the eye is affecting the behavior of moving away from activities that do exist, and the behavior and look for other activities to do. The level of statistical significance p = .01, and considering the average of each group found the proportion each 4 percent made a habit of moving away from activities that do more than any other group is 19.86 times compared to other groups. By measuring the behavior, there are least 10 percent which amounted to only 2.83 times the average behavior. The size of the openings in the eye causes behavior of looking at things other than the activities done in the highest 16 percent, which is the size of an average 37.67 times compared to other openings and a percentage of the number four cause behavioral least six times.

The ratio of openings at eye level to the size affects the movement of the activity, behavior and look for other activities to do. Therefore, to reduce the number of behavior moving away from activities that do exist, they should make the environment of size of the openings at eye level at 10 percent and to reduce the number of behaviors to look for other activities to do. They should create the environment for size of the openings in the sight of four per room, which accounted for openings at eye level on size affects the concentration of such openness civilized scholar in 2546, has said that the environment of the classroom. If there are too many doors, kids would walk out of the room. If there are too many windows, kids would be distracting, because autistic children will often look toward the window.

**Table 4.16** shows the variance of the behavior of autistic children in different areas. Proportion to the size opening at eye level.

| Behavior | Variance | Sum of Squares | df | Mean Square | F | *p* value |
|---|---|---|---|---|---|---|
| The moving out from activities that do exist. | Among group | 1463.397 | 5 | 292.679 | 7.448 | .000 |
| | Within group | 1571.959 | 40 | 39.299 | | |
| | Together | 3035.356 | 45 | | | |
| To look for other activities to do. | Among group | 5195.673 | 5 | 1039.135 | 11.828 | .000 |
| | Within group | 3514.089 | 40 | 87.852 | | |
| | Together | 8709.761 | 45 | | | |

7) Things to see outside the window

The correlating the independent variable is visible outside the window. That influence the behavior of autistic children or statistical t-test is a test to compare the variables within each group (the first group is sensational scenery alone, and the second group is a view that is both sensual and relaxed feel).

Table 4.17 shows a comparison of average, and the standard deviation of the behavior of autistic children. Things to see outside the window effect relationship between visible variables outside the window. It is influenced by a single variable

which is a behaviors to look for activities to do. It was found that the differences are statistically significant, but does not affect the behavior of variables to look for activities to do, and behavior and walked out of the room. The details are as following:

Behaviors to look for activities to do: The difference in views sensual alone (M = 18.45, SD = 15.127) and scenery that is both sensual and relaxed feel. [M = 7.69, SD = 5.068; t (43.43) = 3.6, p = .001] (see Figure 4.18 shows a comparison of average, and the standard deviation of the behavior of autistic children. Things to see outside the window), meaning that the visible outer openings affect the behavior of a number of other activities which are also very different. It affects the behavior of walking away from activities that do exist, and the habit of walking out of the room so undifferently.

Therefore, the things that can be seen outside the window both with a view to stimulating the senses alone, and with a view to stimulate the senses and relax the senses together in the same environment are affecting the behavior of looking for other activities on a level of statistical significance only one behavior. If the scenery sensual alone, it will make a behavior of looking at things other than the current activities over the scenery sensual and relaxed feel together in the same environment. So if you want to reduce the behavior of looking for other activities to do, they should provide sensual and relaxing scenery, common sense in the same environment. Due to the visible outer openings affect the concentration of children as civilized sustained in 2003, it has said that the environment of the classroom with too many doors cause kids to walk out of the room. The classroom with too many windows also makes kids distracting, because autistic children will often look toward the window.

**Table 4.17** shows a comparison of average and the standard deviation of the behavior of autistic children. Things to see outside the window.

| Things to see outside the window | Mean | SD | t | *p* value |
|---|---|---|---|---|
| Scenery sensual (n=33) | 18.45 | 15.127 | 3.604 | .001 |
| Scenery stimulating and soothing the senses (n=13) | 7.69 | 5.068 | | |

8) The distance of the seat with storage devices

The analysis of relationship between the distances of seat to devices storage: The behavior of autistic children statistics use One way ANOVA. One way ANOVA is a test which analyzes the variables between the groups (the first distance 0.30 meters at the second pitch of 1.60 mm. Group 3 distance of 1.70 meters, a group of four stages up to 2.2 meters)

Table 4.18 shows the variance analysis of the behavior of autistic children in different areas, and the distance of the seat with storage devices. The relationships between the distances of the seat to devices storage are influencing only one variable which is the behaviors to look for other activities to do. The difference was statistically significant at p = .00. However, there are differences within the group that requires little to compare with the Post-Hoc Key HSD test showed the average in each group. The differences are as following:

The behaviors to look for other activities to do has the difference [F (3,42) = 14.41, p = .000], and there are differences between the two groups, with one group of three and four as group 2 (M = 37.67, SD = 19.60) different, group 1 (M = 8.98, SD = 6.19) differs from group 3 (M = 14.72, SD = 9.58), and is different from group 4 (M = 8.81, SD = 4.54) (See table 4.19 shows variance analysis of the behavior of autistic children in different areas. The distance of the seat with storage devices) means that the distance of the seat with storage devices affect the behavior of a number of other activities are also very different. It affects the behavior of walking away from activities that do exist, and the behavior of walking out of the room undifferently.

The distance of the seat with storage devices affect behavior, look for other activities to do. The level of statistical significance p = .00, and considering the average of each group found a 1.6 meter spacing behavior more than any other group is 37.67 times compared to other groups. The cause of such behavior less by measuring the behavior minimum distance of 2.2 meters, which is only 8.8 times the average behavior.

Thus, the distance of the seat with storage devices affect behavior, look for other activities to do. Therefore, to reduce the number of behavior, they hould provide a seat made of children from the storage device at a distance of 2.2 m.

According to uphold civilized scholar in 2546 and Display Mode Trang on the property in 2545, it has said that the provision of materials and equipment used in teaching should be near to the teachers which he can reach it without walking. If children go to school to be diverted to anything else and allows teachers to attract the attention of children to be hard, they should put the activities equipment on the shelves or on the closet to make children not confused.

**Table 4.18** shows the variance of the behavior of autistic children in different areas. The distance of the seat to devices storage.

| Behavior | Variances | Sum of Squares | df | Mean Square | F | *p* value |
|---|---|---|---|---|---|---|
| To look for other activities to do | Among group | 4418.647 | 3 | 1472.882 | 14.416 | .000 |
| | Within group | 4291.114 | 42 | 102.169 | | |
| | Total | 8709.761 | 45 | | | |

9) The share of internal living space

The analysis of the relationship between independent variables: The share of internal living space that influence the behavior of autistic children by using statistical t-test is a test which analyzes the factors within the parameters of each group (the first group is not partitioned space, and the second is to have the space. )

Table 4.19 shows a comparison of average and the standard deviation of the behavior of autistic children to share living space, and the relationship between the variable divisions of internal living space. The second variable is influenced by the behavior of moving away from activities that do exist, behavior and look for other activities to do. It was found that the difference was statistically significant at p = .005, with details as following:

The behavior of moving out from current activities has the difference if no Barrier (M = 3.81, SD = 3.43) and with the space. [M = 11.44, SD = 10.48; t (22.14) = -3.128, p = .005].

The behaviors of looking for other activities to do, it has the difference, if there is no space. (M = 21.8, SD = 15.33) and the partition area. [M = 7.1, SD = 4.54; t

(28) = 30.51, p = .000] (See Figure 4.20 shows a comparison of average, and the standard deviation of the behavior of children with autism to share living space) means dividing the interior living space. It affects the behavior of walking away from activities that do exist and a number of behaviors of looking for other activities differently, but it has the influence of the behavior of walking out of the room undifferently.

As a result, environments with or without a living space inside have an impact on the moving away from existing activity behavior and look at other thing besides the doing activity behavior have high statistical significance. If barrier, it will cause the moving away from activity behavior over the environment that no barrier, which make look at other thing besides the doing activity behavior over than environment that barriered.

Therefore, if it is needed to decrease the moving away from existing activity behavior of autistic children, environment should be designed with no barrier. If we want to decrease look at other thing besides the doing activity behavior, there should be a separate area of the barrier because the presence or absence of the delineated area of the room will affects the children's concentration. The delineated area or separate specialized instruction using the corner of the room to practice or arrange blinds them to avoid interference from other stimuli. This is what makes us free to concentrate on their studies (Umaporn trangkasambat 2002), and using a simple wall to avoid interference from other stimuli and barrier reduced stimuli will cause the perception of stimuli too many children, symptoms and treatment of anxiety, distraction, which makes learning stumbling down (Susan Stokes referred to Padong ariyavinh 2003)

**Table 4.19** Show comparison of mean and standard deviation for number of behavior of autistic children with barrier.

| Behavior | Barrier | Mean(Mean) | Standard Deviation (SD) | t | *p* value |
|---|---|---|---|---|---|
| Moving away from existing activity | No barrier (n=26)<br>Barrier (n=20) | 3.81<br>11.44 | 3.425<br>10.476 | -3.128 | .005 |
| Look another activity beside doing activity | No barreir (n=26)<br>Barrier (n=20) | 21.80<br>7.10 | 15.33<br>4.54 | 4.633 | .000 |

### 3.2 The perceived provocation voice glitches

1) The distance between the classrooms

Analysis of the relationship of the distance between the classrooms with the behavior of the autistic children by using One way ANOVA statistical for doing analysis, the variables between the groups (the first group distance 0 meter, the second distance 5 meters, the third group distance 10 meters).

From Table 4.20 Show the analysis of variance of the autistic children's characteristic in the different type of distance, the result of the variable of the each distance influence to the two factors: the moving away from existing activity behavior and look at other thing besides the doing activity behavior, which differently with significant p=.00. However, there still have the minimum difference mean within the group that needed to use Post-Hoc compare with Key HSD for testing to show the mean in each group, the differences are as follow:

Moving away from existing activity behavior have difference value value *[F(2,43)=15.36, p=.000]* and have the difference mean value between the second group, the first group and the third group. Therefore, the second group *(M=19.86,SD=12.17)* different from the first group *(M=3.81,SD=3.43)* and different from the third group *(M=7.83,SD=7.53).*

Looking at other activity besides doing activity behavior have difference value [F(2,43) = 8.42, p = .001] and have the difference mean value of between the first

group, the second group and the third group. Therefore, the first group (M = 21.80, SD = 15.33) different from the second group (M = 6.19, SD = 3.28), and different the third group (M = 7.49, SD = 5.05) (see table 4.21 shows the variance of the behavior of the autistic children's characteristic in different distance between classroom) means the distance between classroom affect the behavior of walking away from activities that do exist and a number of behaviors to look at what other activities are very different but have an effect on the behavior of walking out of the room so no different.

The distance between the classrooms have an impact on the moving away from existing activity behavior and look at other thing besides the doing activity behavior, which in the level of statistical significance p = .01, and considering the mean value of each group found that the distance of 5 meters causing the moving away from existing activity behavior maximum is 19.86 times compared to most other groups, which range 0 m that make the number of behavior moving away from the existing activity that are at least 3.81 times. The look at other thing besides the doing activity behavior, It is most commonly caused when the distance 0 m. of 21.80 times, compared with other groups. The distance cause that makes this behavior minimum is 5 m, which the mean amounted of behavior only 6.2 times.

The distance between the classrooms affect the moving away from existing activity behavior and look at other thing besides the doing activity behavior. Therefore, to reduce the moving away from existing activity behavior should provide room adjacent and if want to reduce look at other thing besides the doing activity behavior should set the distance between beds is 5 meters because the noise is a part that fell child concentrate and the factors contributing to the noise in the area that have adjacent classroom and near the corridors, this will causes the noise come into the room (Padong arayavinh 2003).

**Table 4.20** Show analysis of variance of the autistic children's characteristic in different way, the distance between the classrooms.

| Behavior | Sourcing variance | Sum of Squares | df | Mean Square | F | *p* value |
|---|---|---|---|---|---|---|
| Moving away from existing activity behavior | Between group | 1264.705 | 2 | 632.353 | 15.357 | .000 |
| | Inside group | 1770.651 | 43 | 41.178 | | |
| | Both | 3035.356 | 45 | | | |
| Look at other thing besides the doing activity behavior | Between group | 2450.211 | 2 | 1225.106 | 8.416 | .001 |
| | Inside group | 6259.550 | 43 | 145.571 | | |
| | Both | 8709.761 | 45 | | | |

2) Geographical characteristics of the classroom to another classroom

Analysis of the relationship between the independent variables, geographical characteristics of the classroom to another classroom that influence behavior of children with autistic by using statistical t-test is a test which analyzes the factors within the parameters of each group (the first group is separated by a wall, and the second group is the passage and the space between rooms)

From table 4.21 Comparison of mean and the standard deviation of the behavior with the autistic children's characteristics by geographical classroom to another classroom influence to two variables:

Moving away from existing activity behavior and look at other thing besides the doing activity behavior are founded that it so difference was statistically significant, the details are as follows:

Moving away from existing activity behavior have different value seperated by a walls *(M=11.44,SD=10.48)* and contains the space between the rooms *[M=3.81,SD=3.43; t(22.14)= -3.128, p=.005]*

Looking at other activities besides doing activity behavior have different value separated by a walls *(M=7.1,SD=4.54)* and contains the space between the rooms *[M=21.8,SD=15.33;t(30.5)=-4.63.51,p=.000]* (See table 4.22 Comparison of mean and the standard deviation of children with autistic characterized by geographical classroom to another classroom) means geographical characteristics of the classroom

to another classroom affects the moving away from existing activity behavior and a number of behaviors to look at other thing besides the doing activity behavior are very different but have an effect on the behavior of walking out of the room so no different

Therefore, the space between one classroom to another classroom have an impact to the moving away from existing activity behavior and look at another thing beside the doing activity behavior in a high statistical significance. If the room is seperated by a wall, it will cause the moving activity behavior over enviroment which are passage and space between the rooms. On the other hand, classroom that seperated by wall are causing the look at another thing beside the doing activity behavior decreased.

**Table 4.21** Comparisons of mean and the standard deviation of children with autistic characteristics by geographical classroom to another classroom.

| Behaviors | Spacing between one classroom to another classroom | Mean (Mean) | Standard Deviation (SD) | t | *p* value |
|---|---|---|---|---|---|
| Moving from activity while doing | partition (n=20)<br>there are passages and spaces (n=26) | 11.44<br>3.81 | 10.476<br>3.425 | 3.128 | .005 |
| Seeing other activity doing | partition (n=20)<br>there are passages and spaces (n=26) | 7.10<br>21.80 | 4.540<br>15.330 | -4.633 | .000 |

3) Characteristics of corridor outside the classroom

Correlating the nature of the corrider outside the classroom and behavior of children with autistic was tested using One way ANOVA statistic analysis the variable between group( First, walk road is free space. Second, only the secondary group.

From table 4.22 analysis probability of the behavior of austistic children in the differency walk outside the classroom, the variable nature of the relationship of walk

outside the classroom, which influenced by two variables that are out of the habit of moving and behavior to look another processing activity, which different was statistically significant at p = .00. However, there are still different in mean value in a small group that need to use Post-Hoc in-order to compare with Key-HSD test to show the mean value of each group which different as folow:

Moving away from existing activity behavior have difference value *[F(3,42)=12.573, p=.000]* and difference mean value between group 1, 2 and 4 are group 1 *(M=19.86,SD=12.17)* difference from group 2 *(M=4.33,SD=6.19)* and difference from group 4 *(M=3.81,SD=3.43)*, but nothing difference from group 3.

Looking for another activity beside doing activity behavior has difference value *[F(3,42)=5.56, P=.003]* and difference mean value between group 4, 1 and 3 are group 4 *(M=21.80,SD=15.33)* difference from group 1 *(M=6.19,SD=3.28)* and difference from group 3 *(M=6,SD=3.43)* but nothing difference between group 2 (look at table 4.23 analysis of variance showed the behavior of autistic children in different way, walk outside the classroom ) means the character while walk outside the classroom that will affect the walk outside activity that still doing behavior and number of looking to another activity behavior differently, but it will influenced the behavior of walking out of the room so no different.

Walk outside the classroom feature influences to moving from doing activity behavior and looking another thing beside the doing activity behavior that still doing in statistical significance level *p*=.01 and while decide with the mean value of each group, it was found that walk outside character, which is space character, cause the moving from doing activity behavior the most, 19.86 times while comparing with another group. This pathway has both seperated into main and vice passage cause the number of the moving from existing activity behavior is 3.81 times minimum. For path of looking to another activity beside doing activity behavior is coming from both main and vice passage has 21.80 times compared with another group, which made behavior above lower. The character that cause minimum behavior is walk outside the room with space, which have number of character just only 6.2 times. Therefore, walk outside the classroom influences to the moving from existing activity behavior and look another thing beside the doing activity behavior in order to remove the

number of moving away to another activity behavior should prepare walking character both main and vice passages separately and if it is wanted to remove the number of look to another thing beside the doing activity behavior should prepare walk outside from the classroom with space corrider. Walk outside the classroom affects the children behavior, because the voice, path of meditation will decreased and the factor contribution to the noise in the area is classroom are closed together and near the corrider, which cause the noise inside classroom (Padong arayavinh 2546).

**Table 4.22** Analysis of variance showed behavior of autistic children in differency of walk outside the classroom.

| Behavior | The variance | Sum of Squares | df | Mean Square | F | *p* value |
|---|---|---|---|---|---|---|
| Moving away from existing activity | between group | 1436.205 | 3 | 478.735 | 12.573 | .000 |
| | inside group | 1599.151 | 42 | 38.075 | | |
| | both | 3035.356 | 45 | | | |
| Seeing what another activity do | between group | 2481.213 | 3 | 827.071 | 5.577 | .003 |
| | inside group | 6228.548 | 42 | 148.299 | | |
| | both | 8709.761 | 45 | | | |

4) Sound utilization within the classroom

Analysis the relationship of independent variable, sound using in the classroom,is it influence to autistic children or not by using t-test statistic is the test, which is the comparative analysis of the variable within each group.(first group is no using the voice and group 2 is using the voice).

From table 4.23 shows a comparison of mean and standard deviation of the number of behavior of the autistic children by geographical from classroom to another classroom. The result of the relationship between the used of sound in the classroom variable influence with two variables are move away from activity that do exist and look another activity beside doing activity, which found that the differency in statical significance. The details are as follows:

Moving away from activity that do exist behavior have differency value by no sound used *(M=11.44,SD=10.48)* and contain sound used *[M=3.81,SD=3.43;t(22.14)= 3.128,p=.005]*

Looking to another activity beside doing activity behavior have differency value while no sound used *(M=7.1,SD=4.54)* and contains sound used *[M=21.8,SD=15.33; t(30.5)=-4.63.51, p=.000]* (see table 4.24 show comparetion mean value and standard deviation from the number of autistic children's behavior with geographical feature of classroom and another classroom)means sound used in the classroom affects the number of move away from activity that do exist behavior and number of look another activity beside doing activity behavior differently but influence to number of moving away from activity that do exist no differently. Therefore,

Sound used in the classroom influences to move away from activity that do exist behavior and look to another activity beside doing activity behavior in level of the statistical significance. If no sound used, it causes move away from activity that do exist behavior more than enviroment, which having sound used. In opposite, no sound used classroom will causes look another activity beside doing activity behavior less than sound used classroom.

**Table 4.23** Show mean compalation and standard deviation for the number of autistic children behavior with geographical of the classroom with another classroom.

| Behavior | Geographical from one classroom to another classroom | Mean(Mean) | Standard deviation (SD) | t | *p* value |
|---|---|---|---|---|---|
| Moving away from existing activity | partition (n=20)<br>passage and geographical (n=26) | 11.44<br>3.81 | 10.476<br>3.425 | 3.128 | .005 |

## 4.3 Summary of data analysis

The analysis of all of the above can be summarized analysis by answering research questions are as following.

**The first sub-question** is which environment that can reduce defective management dictates of children with autistic, can be explained as follows:

**Symptom deficiencies of Executive Order :** Can be reduced by a factor of environment priority areas in order to access it and the use of symbol to show the sequence of activities both of which characteristics affect the behavior of teachers influence children to start the activities and conduct activities on their own in statistically significant at p = .00.

**The second sub-question:** Can any characteristics atmosphere reduce symptom impaired social information processing of autistic children? Which can be described as following.

**Symptoms impaired social information processing** can be reduced by environment in two factors: 1) physical environment factor and 2) the interaction of the people in the area. The details are as followings.

1) Physical environmental factor consists of 2 factors are:

1.1) Area size while clutching the activity for one autistic child have an impact on the moving away from the activity behavior and look to other activities beside doing activity with significant p = .00

1.2) Capable of flexible space have an impact with moving away of existing activity with significant *p=. 00*

2) Factors of the interaction of people in the area

included 2 sub-factors, which are:

2.1) Seating position between teachers and students in the event (group) have an impact on moving away from existing activity behavior with significant p = 0.01 and seating position between teacher and student in activity (alone) have an impact on the behavior of moving out of the activities

and looking other activity beside doing activity behavior with significant p = 0.01 and

2.2) The distance between the seats of teachers and students in the event (group) affects moving away from activity behavior that are simply behaving significant at p = 0.01. The distance between the seat of the teacher to the student activity (single) have an impact on the moving away from existing activity behavior and to look at other activities beside doing activity with significant p = 0.01. And the distance between the seats of teachers in activity (formation) effect to the moving away from activity behavior and look at the other activity besides doing activity behavior with significant p = 0.01.

**The third sub-question:** can any characteristics atmosphere reduce symptoms impaired information processing sensory perception of stimuli and learning deficiency of children autistic? It can be explained as followings.

**Symptom impaired information processing sensory perception of stimuli and learning deficiency** can be reduced by a factor of environment that consists of 1) the perceived provocation visually impaired, and 2) the perceived deficiency of the doorstep in which they conists of following sub-factors.

1) Perceived stimuli visually deficiency comprises 9 sub-factors as followings.

1.1) The complexity of the classroom decorated with pictures that are not related to eye level, which impact on the moving away from the existing activity behavior with significant p = 0.01 and habits of looking at other thing beside the activity with significant p = 0.05

1.2) The classroom is decorated with hanging have an impact on the moving away from the existing project behavior and look other activity beside doing activity behavior with significant p = 0.01

1.3) The distance of the seat from the window affects the behavior of looking at other activity than doing activity in only one behavior with significant p = 0.01

1.4) The distance of the seat from the door affects the moving away from the existing activity behavior with significant p = 0.05 and looking at other activity than doing activity with significant p = 0.01

1.5) Size openings at eye level impacts on the moving away from existing activity behavior and look at other activity beside doing activity behavior with significant p = 0.01

1.6) Proportion openings to room size affects the at p = 0.0

1.7) Things to see outside the window disturbs the behavior of looking at things other than doing activity in only one behavior with significant p = 0.01

1.8) The distance from the storage device impacts on the behavior of looking at things other than doing activity in only one behavior with significant p = 0.01

1.9) The share of internal living space affects the moving away from activity behavior and look at other activity beside doing activity behavior with significant p = 0.01

2) The perceived provocation audio glitch consists of 4 sub-factors such as:

2.1) The distance between the classroom affects the moving away from activity behavior and look at other activity beside doing activity behavior with significant p = 0.01

2.2) Geographical characteristics of the classroom to another classroom impacts on the moving away from activity behavior and look at other activity beside doing activity behavior with significant p = 0.01

2.3) Style corridor outside the classroom affects the moving away from activity behavior and look at other activity beside doing activity behavior with significant p = 0.01

2.4) The use of sound in the classroom affects the moving away from activity behavior and look at other activity beside doing activity behavior with significant p = 0.01

Results from the data analysis in Chapter 4 will be able to discuss the nature of the model and the physical environment and the interaction between human contributing to the development of children with autistic activity, which appears in Chapter 5 following.

# Chapter 5

# Discussion

A result of research discussion is a presentation of summarizing the analyzing information in chapter 4 by linking to the purpose of three research questions in order to answer them correctly. The discussion of results will demonstrate a connection of literature which is discovered many results such as relevancy, sponsor, conflict, or it will be appeared the new details which will be summarized as the following.

## 5.1 Results of research discussion

From the objective of the research, it was studied about a characteristic of autistic children and some development activities which were taken place in the environment. The factors study of physical environment condition and interactions between people in the environment are built for a developing activity of autistic children and to study about some sample relation groups while having activities in the environment. The purpose of this research is to seek for a physical environment model and interaction between people which is contributed for the development activities of autistic children. According to the information of research analysis, it showed about the overall summarizing objective and link to the questions below:

**The first objective: To study about the characteristic of autistic children and the development activities taken place in the environment.**

From the study about characteristic of autistic children, it found that their typical feature can be a lack characterized by children's symptom in which three lacking sides which are being together including 1) the lack of administration order, 2) the lack of processing social information, and 3) the lack of processing sense information and the perception of stimuli and learning disabilities by separating visual and audio.

The feature of developing activity that is taken place in that environment was an activity to develop autistic children in a special education center. It can help those children to achieve a better development. Each day it will consist of individual and

group activities such as: doing activities in front of the class and so on. These are all the same aspect activities that we are able to see for all environments. It is an independence variation of the research because it analyses the relationship between dependent variable and the reaction of autistic children in each environment.

**Thus, from the first objective, the three characteristics of autistic children and the development activities which are taken place in the same environment can be summarized. These two things are managed into the independent variations. Moreover, they used in statistical analysis include the environment factors and the expression of children behavior.**

**The second objective: to learn about factors such as the physical condition factors and the interaction between people in the environment are able to develop autistic children activities.**

In the reviewing of literature, a survey and research is used to observe a real environment in the six areas of environmental factors. After that, environmental condition and factors are found. That is related to the development activities in the area of our research. The environmental factors can be divided into two main factors such as: physical environment and the factor of people interaction in that area. In addition, it was separated into 19 factors such as:

The physical environment factor is divided into 17 factors such as: 1) the priority areas in order to access it easily, 2) the symbolize using of the sequence activities, 3) the space areas for Autistic children in playing activities, 4) the capable of expanding areas, 5) the complication of classroom decoration that the pictures are not related to eye level study, 6) the classroom decoration by using hanging things, 7) the distance of each seat to the window, 8) the distance of each seat to the door, 9) the gap size that should be open for eye level, 10) the proportion space opens for eye level in each room, 11) the things that they can see beside the opening space, 12) the distance between the seats and the storage equipment area 13) the separating area for the interior space, 14) the distance between each classroom, 15) the distance feature between each classroom, 16) the feature way outside the classroom, and 17) the using of audio sound in the classroom.

The factor of people interaction in the area is divided into 2 sub-factors including 1) the position seats between teachers and students, and 2) the distance seats between teachers and students during doing activities.

**As a result, from the second objective of the study, it can be concluded that all the factors, the physical environment conditions, and the interaction between people in the environment for the developing activities of autistic children comprised of 19 sub-factors which can be used in the following statistical analysis.**

**The third objective: To study the relationship of the sample group while they are having activities in the environment. The purpose of this research is to seek for modeling factors in both environment factor and the factors of people interaction to develop their supporting with autistic children.**

The purpose of this research can describe the study result of research questions which is divided into 3 sub-questions such as 1) what kind of characteristic environmental factors can reduce the lack management dictator of autistic children?, 2) what kind of characteristic environmental factors can reduce the impaired management process of social information of autistic children?, and 3) what kind of characteristic environment factors can reduce impaired information processing sensory stimuli, perceptions, and learning disabilities? They are summarized in a table 5.1.

Table 5.1 show the relationship of deficiency and environmental factors affecting the autistic children's behaviors.

| **The first sub-question**: What kind of characteristic environmental factors can reduce the lacking management dictator of Autistic children? | | |
|---|---|---|
| **The lacking symptoms** | **Environmental factors** | **The reaction that can affect by the environment** |
| The learning disability of command management | -The priority areas in order to access it easily<br>- The using symbolize of the sequence activities | -The actions that can persuade children to start doing activities by their teachers and by themselves |

| **The second sub-question**: What kind of characteristic environmental factors can reduce the impaired management process of social information of autistic children? | | |
|---|---|---|
| **The lacking symptoms** | **Environmental factors** | **The reaction that can affect the environment** |
| The lacking process of social information | The physical environment<br>- The space areas for an autistic child for playing activities<br>-The capable of expanding areas | -The action of mobile behavior from what they are doing and being able to look other activities beside what they are doing. |
| | The interaction of people in the area<br>- The seats position between teachers and students (in group)<br>- The seats position between teachers and students (in individual)<br>-The seats distance between teachers and students ( in group)<br>- The seats distance between teachers and student ( in individual) | -The action of mobile behavior from what they are doing<br>-The action of mobile behavior from what they are doing and being able to look other activities beside what they are doing.<br>-The action of mobile behavior from what they are doing<br>-The action of mobile behavior from what they are doing and being able to look other activities beside what they are doing. |
| **The third sub-question**: What kind of characteristic of environment factors can reduce a lack process of sense information and the perception of stimuli and learning disabilities of Autistic children? | | |
| **The lacking symptoms** | **Environmental factors** | **The reaction that can affect the environment** |
| -The lack process of sense information and the perception | -The complication of classroom decoration that the pictures are not related to eye level study | - The action of mobile behavior from what they are doing and being able to look other activities beside what they are doing. |

| | | |
|---|---|---|
| of stimuli and learning disabilities<br><br>-The acknowledgment of eye provocation | - The classroom decoration by using hanging things<br>-The distance of each seat from the window<br>-The distance of each seat to the door<br>-The gap size that should be opened for eye level<br>-The proportion space opening for eye level in each room<br>-The things that they can see beside the opening space<br>-The distance between the seats and the storage equipment area<br>-The separating area for the interior space | - The action of mobile behavior from what they are doing.<br>- The action of mobile behavior from what they are doing and being able to look other activities beside what they are doing.<br>- The action of mobile behavior from what they are doing.<br>- The action of mobile behavior from what they are doing and being able to look other activities beside what they are doing. |
| **The lacking symptoms** | **Environmental factors** | **The reaction that can affect the environment** |
| -The lack process of sense information and the perception of stimuli and learning disabilities<br>- The acknowledgement of sound provocation | -The distance between each classroom<br>-The feature distance between one classroom to another classroom<br>-The feature way outside the classroom<br>- The using of audio sound in the classroom | -The action of mobile behavior from what they are doing and being able to look other activities beside what they are doing. |

**The first sub-question**: What kind of characteristic environmental factors can reduce the lack management dictator of Autistic children?

The lack administrative order symptom can be reduced by two factors. Firstly, it is a factor which is related to the priority areas. Thus, we can access it successfully. Secondly, it is used to show the order of activities symbols. Both of these factors affect

the children reactions because we can persuade them to enjoy by doing those activities with their teachers or play by themselves.

From the first sub-question, the environment factors can be summarized as factor which is related to the priority areas. Thus, it can be accessed easily. According to the research, in order to persuade children to do any activities by themselves, an environment areas have to be managed to match with step of each activity. Moreover, the area inside the classroom should be managed by using symbols for showing sequences of the event.

The result of this information is consistent with the summary of the literature research which is discussed about the ordering of environmental management. Therefore, the Autistic children can plan and make decision for which will be the next activities. The children can decide and control their own reactions on everyday activities easier (khare, R. &Mullick, A.2008 cited from Pilar Arnaiz Sanchez). The recommendation of environment will eliminate the lacking management dictator of Autistic children.

**The second sub-question:** What kind of characteristic environmental factors can reduce the lacking management process of social information of autistic children?

The lacking process of social information can be decreased by two environment factors such as 1) the Physical environment factors, and 2) the people's interactions in the area in which the details are shown in the following.

**1. The Physical environment factors comprise with 2 sub-factors including** 1.1) the space areas for an Autistic child for playing activities, and 1.2) the capable of expanding areas. Both factors affect the reaction of expanding activities area beside what they are doing and being able to look other activities. Those factors can be described many sub-factors as followings.

1.1) The space areas for an Autistic child for playing activities

Based on the literature study which is supporting about the size of each classroom for Autistic children were a little bit small. So, it was affected to those children and it made them uncomfortable. A wide classroom is caused children getting complicated with their ideas because they didn't know what kind of activities they can do with this big classroom (ผดุง อาระวิญญู 2546). The space in doing activity should be

wide enough for a child to adjust their behavior appropriately. It could help students to get benefit in training different skills (Beaver, C.2010 and Ian Scott 2009 and Richer, J.M. & Nicoll, S.1971). However, it has not told exactly about the space of each room. Though, they talked just only about the condition of the room shouldn't too narrow or too wide; moreover, it should be wide enough. From the data analysis, it can be summarized that the area of physical environment factors while having an activity for autistic child, in case you wanted to reduce the moving habit activity beside what you were doing with an Autistic child, the space should be 0.70 acres far from each other. If you want to reduce children's behaviors by interested in other activities, the space area should be 0.50 acres far from each other.

1.2) The capable of expanding areas

From the reviewing of literature found that the area should be provided more flexible and adaptable according to the situation. The area should be narrow or wide which was depended on the activities. The Autistic children will learn much better about the environment because the area had already prepared (Lorma Wing, 2527 cited in Valle de Kota Times Restaurants Noonan 2546), (Beaver, C.2010 and. Ian Scott2009 and Richer, JM & Nicoll, S.1971) and (Khare, R. & Mullick, A.2008 and Vogel.2008 cited in Pilar Arnaiz Sanchez).

From this research, it referred to specify an area style which can be expanded and classified; however, it didn't identify which area is looking like and to improve Autistic children in learning result based on their behavior. The discovering of this research found that the appropriate expansion can reduce some actions in order to move away from the current activities and the area that are appropriate to reduce in looking other things beside the activities beside the current activities that they are doing.

Therefore, the summarizing of environment factor in an expansion area is unless you want to reduce an expansion area in order to move away from the current activities, a space that can be arranged according to the usages should be provided. If intending to reduce children's behaviors by seeing another activity, the environment should separate an area for not being able to reduce.

**2. The people's interactions in the area** consist of 5 sub-factors including 2.1) the seat position between teachers and students by doing group activities affected the mobile behavior from the only one current activity, 2.2) the seat position between teachers and students by doing individual activities affected the mobile behavior from the current activity and other visual activities, 2.3) the distance of seat between teachers and students by doing group activities affected in mobile behavior from the only one current activity, 2.4) the distance seat between teachers and students by doing individual activities affected in mobile behavior from the current activity, other visual activities and the last sub factor, 2.5) the distance seat between teachers and students by doing activities (in front of the class) affected both the current activity and other visual activities beside the activity that they are doing.

2.1 The seat position between teachers and students by doing group activities

According to the analysis information, the environmental characteristic between the seats of teachers and students by doing group work activities has to reduce in moving group activities for teachers and students in order to have a chance to sit in front of each other. While the space between teachers and students were staying in front of each other, teacher will be able to control student's behavior easily. Moreover, the students will always pay attention with their teachers without having other interrupted thing. **The consistency with the research** said that the position of seat in classroom can help teacher to have a good interaction and effectiveness with student by considering on the special character of children. Moreover, for those students who have hyperactivity, the seat position between them can give an effect in controlling this reaction (อุมาพร ตรังคสมบัติ 2545).

2.2 The seat position between teachers and students by doing individual activity

The characteristic of environmental factor is located between teachers and students by doing individual activity. From the analyzing information, found that in case to reduce the expanding by doing individual activity, teachers and student should be provided to sit in front of each other. If in order to reduce visual activity which is not related to teacher's current activity, children should be organized to sit independently.

From the evidence above, it is consistent to the research which is talking about the seat position in the classroom. It has an interaction and efficient with students. Moreover, it is considered that the seat positions will effect with controlling their behaviors because they are hyperactivity children (อุมาพร ตรังคสมบัติ 2545). From above study provide the information about the seat position is effective to control a behavior but it didn't identify which the seat position is like and the way to control their behaviors. This research found that the seat position which is affected to the expanding from the current activity and visual factor to interested with another activity in the different seating factors.

As a result, according to the physical environmental feature, the need to reduce the expanding by doing individual activity, teachers and students should be provided to sit in front of each other (face to face). But in order to reduce the number of visual behavior to interest with another thing, students should be provided to sit independently. Therefore, the lack process of social information can be reduced.

2.3 The distance between the seats of teachers and students in group activities

The distance of environmental factor located between the seats of teachers and students when doing group activities. From the analysis information found that in order to reduce the mobile habit from group activities, we should manage students to sit 1.21 to 1.50 meters far from teachers.

The result of this research is supplementary research, from the research data which is mentioned about the seat position and the interaction of students in the class. The statement can be associated which is described about the position of students because it can help them to have an interaction and have efficiency while they are studying. Based on the children's characteristic, the seat position will effect in controlling their behaviors (อุมาพร ตรังคสมบัติ 2545). Sometimes, it does mention about the siting space between people in the environment. If the seat position is considered, the sitting space will be a part of relevant, be important for an interaction between people in the environment and no less than the seat as well.

As a result, it can be summarized that **if there is a group seating activity, the distance between teachers and students should be 1.21 to 1.50 meters.** Therefore, the lack of processing sense information can be reduced in society.

2.4 The distance between teachers and students by doing individual activity

The environment factor has a distance between teachers and students by doing individual activity. Base on the research analysis found that in order to diminish the moving activities of students by doing individual activity, the space need to be 0.00 to 0.30 meter far from each other. Moreover, in order to reduce other unimportant visual activities, students should be provided to sit independently without any controlling from teachers.

The result of this research is supplementary research from the issue of seating position. In addition, from the data of previous research which discussed about the seat position and interaction with seat position in the classroom helps to create interaction and performance to the students. Base on the consideration from characteristic of moving children which the seat position between each other has effect to the controlling of behavior (อุมาพร ตรังคสมบัติ 2545). Due to the seating space for the child interaction is not less important than the seat position in the environment, which the environmental characteristics of both types have impact to the reaction of children differently, by in order to reduce the mobile behavior from the doing activities, the distance between each other should be 0.00-0.30m, and in order to reduce the behavior of looking other things beside the activities that they are doing should let children to sit independently, so it can reduce the symptoms of impaired information processing in society.

2.4) The distance between the seats of the teacher to the student for the activities in front of the class

For environmental characteristics, the distance between the seats of the teacher to the student for the activities in front of the class, from the analysis found that in order to reduce the mobile behavior from the activities in front of the classroom, student and teacher should be arranged to sit apart at distance of 1.21-1.50m, and in order to reduce the behavior of looking other things beside the activities in front of the class, student and teacher should be arranged to sit apart at distant of 0.91-1.20m.

The study of distance is the supplementary study from the issue of seat position. In addition, from the data of previous research discusses about the seat

position and the interaction in the classroom in the article 2.2 and 2.3. Due to the seating space for the child interaction is not less important than the seat position in the environment. From the result of data analysis, both two types of environmental characteristic that has effect to the behavior of children differently, in order to reduce the mobile behavior from the activities in front of the class, the distance between each other should be 1.21-1.50m, and in order to reduce the behavior of looking other things beside the activities that they are doing, the distance between each other should be 0.91-1.20m, so it can reduce the symptoms of impaired information processing in society.

**As the sub-question 2, the types of differential environment factors can be concluded by separating into two factors, the factor of physical environment and the factors of interaction of people in the area with the followings:**

The factor of physical environment

The development activities area for doing the activities for one autistic child should have space between 0.50m$^2$ to 0.70 m$^2$ and this area for doing the development activities should use the elastic area which children can be flexible while doing the activities.

The factors of interaction of people in the area

When there are group activities and individual activities, the teacher and student should sit in opposite side between teacher and student in the group activities with the distance of 1.21m to 1.50m and the distance between teacher and student in the individual activities with 0.00m to 0.30m, while the distance of activities in front of the class should be 1.20m.

All above types of differential environmental factors can reduce the impaired social information processing of children with autism for significant statistic.

Sub-questions 3 What are types of atmosphere that reduce the impaired information processing sensory stimuli, perceptions, and learning disabilities?

Impaired information processing sensory stimuli, perception, and learning disabilities including a perception of visual impairments and perception of audio impairment can be reduced by factors of the environment as follow:

Perception of visual impairments can be reduced by the factor of physical environment factors in 9 sub-factors such as 1) the complexity of classroom decoration with the pictures that are not related to the studying in term of eye level. 2) decoration of class room with hanging things, 3) distance of the seat from the window, 4) distance of the seat from the door, 5) The window size in eye level, 6) window size compare to the size of room, 7) things that are seen outside the window, 8) distance from the equipment storage, 9) division of internal space, and factor, and 10) distance of the seat from the window.

1) The complexity of classroom decoration with the pictures that are not related to the studying in term of eye level

Environmental characteristic of the complexity of classroom decorations with the pictures that are not related to the studying in term of eye level, from the analysis found that for reducing the mobile behavior from the activities that they are doing should use the images that are not related to study to decorate the classroom to be very complicated. In contrast, in order to reduce the behavior of looking at other activities beside the activities that they are doing, the environment should be less complicated or not complicated at all.

From the information above is related to the literature study which say that the design should be in detail and choose the equipment that is appropriated to make it easy for decorating, the wall should be decorated without the hanging things and cartoon sticker, excepted the image that is used for studying, the decoration of environment for supporting studying and teaching in particular will avoid creating unnecessary stimulation to children (อุมาพร ตรังคสมบัติ 2545). From that study with the discovery on issues of environmental design, the behavior of looking at other things beside the activities that is doing in the internal environment should use the picture that is less complicated or not complicated at all. In contrast, with the type of environment to reduce the mobile habits from the activities that they are doing, it should use the images that are not related to study to decorate the classroom to be very complicated, but as the information from the literature, there is not study that indicate the above decoration which it affects to any behavior and how does it affect?

If this point is clearly considered, it could be considered according to literature which found that inside the classroom should not have the picture that is not related to studying and teaching. It should have the appropriated detail for ease to decorate to avoid creating unnecessary perception to children. Moreover, the research illustrated unconnected pictures that are used for the studying and teaching should be the pictures with less complication or no complication at all in order to cause the development of children to be better. Thus, the environmental characteristics in this issue can be summarized that **if there are the unrelated pictures with the leaning in term of eye level, the pictures should be less complicated or not complicated at all.**

2) Decorating class room with hanging things

Environmental characteristic of classroom decoration with hanging things, from the analysis found that in order to reduce the mobile behavior from the activities that they are doing should use the hanging things to decorate classroom. However, in order to reduce the behavior of looking at other activities beside the activities that they are doing, inside the classroom should not use hanging things.

The previous findings stated there is linkage with the literature that indicates the lack of hanging thing will help to avoid creating of unnecessary stimulation to children (อุมาพร ตรังคสมบัติ 2545).

Therefore, from such literature, it complies with the finding on issues of environmental design, reducing the behavior of looking at other things, the activities do not focus only one behavior, but it is contrast from the type of environment to reduce the mobile behavior from the activities that they are doing. If it is needed to reduce the mobile behavior from the activities that they are doing, it should use the hanging things for decoration the classroom. However, from the literature, there have not many studies indicating the above unnecessary stimulation will affect to any behaviors and how it affect.

So if considering this point clearly, it could be referred to literature study for relating to the discovery of reducing the behavior of looking at other things beside the activities that is doing is confirmation of the existing literature that **should not have the hanging things in the class room because it is the creation of unnecessary**

**stimulation to children.** So it can reduce impaired information processing sensory stimuli, perception, and learning disabilities, if there are hanging thing will make the behavior of looking other things while doing the activities will result in interruption of development activities.

3) The distance of the seat from the window

Environmental characteristic on the issue of the distance of the seat from the window, from the analysis of the data, found that in order to reduce the behavior of looking at other things beside the activities that is doing, it should have the distance 3.3 m of the seat from the window.

From the finding related to the literature which mentions that the arrangement of the seat for autistic children appropriately will help the child to not do wobble such the seat is far from window or sitting in the fronted class near to the teacher and the design of the classroom that could create very less interruption from others as much as possible. Moreover, for not cause the annoyed feeling, the good environment should not have the attracted element that lead to see, hear, touch which disturb the children to distract from the preparation of training in the class room, otherwise, impaired concentration will be the problem until they cannot study (Beaver, C.2010 and Ian Scott2009 and Richer,J.M. & Nicoll,S.197 ฟีก Vogel.2008 in Pilar Arnaiz Sanchez) (ผดุง อารยะวิญญู 2546). Because the above literature study does not specify the how long of distance from the window is and how it affects to the kinds of behavior, therefore, this research is supplementary research from the study that can clearly particularize about **the distance of the seat from the window should have distance between 3.3m**, which will make the behavior of looking other things while doing the activities happen less and make the concentration be more focused and can reduce the impaired information processing sensory stimuli, perceptions, and learning disabilities.

4) The distance of the seat from the door

Environmental aspects considering the distance of the seat from the door, from the analysis found that in order to reduce the mobile behavior of the activities that they are doing, should have the distance between the seat and door about 4meters

and if it is wanted to reduce the behavior of looking other things while doing the activities should have the distance from the seat to door is 5.2meters.

From the finding related to the literature study which claims that the arrangement the seat for autistic child appropriately will help the child not to do wobble such as sitting far from the window or sitting nearby the teacher, and the design of the classroom could create very less interruption from others as much as possible, as well as not cause the annoyed feeling. The good environment should not have the attracted element that lead to see, hear, touch which disturb the children to distract from the preparation of training in the class room, otherwise, impaired concentration will be the problem until they cannot study (Beaver, C.2010 and Ian Scott2009 and Richer,J.M. & Nicoll,S.197 ฟีก Vogel.2008 in Pilar Arnaiz Sanchez) (ผดุง อารยะวิญญู 2546). Because the literature study above has mentioned about the distance of the seat position with the window, but it has not specified about the distance from the door. This is the opening that is the main environmental factor and very importance to further study.

Therefore the finding of this study in this point is supplementary findings originated by which the literature which can particularize clearly about the distance of the seat from the door should have distance 4m in order to reduce the mobile behavior of the activities that they are doing and should have the distance of 5.2m in order to reduce the behavior of looking other things while doing the activities which found that the distance that have differentiation is accorded to the kind of different behavioral impact.

Therefore, this problem needs to be considered that this behavior is the most interrupted behavior to the activities. The analysis found that the mobile behavior of the activities that they are doing is the behavior that when it happens, it will pull to more difficult return of the child's concentration than the behavior of looking other things while doing the activities. Thus, the distance of the seat from the door should be 4meters which is the way that can minimize the cause of mobile behavior from the activities that they are doing principally. In conclusion, the factor of physical environment can be concluded that it **should be arranged the seat from the door have to be 4 meters,** so it will be able to reduce impaired information processing sensory stimuli, perceptions, and learning disabilities.

5) The window size of eye level

Environmental aspects to consider the opening size of eye level from the analysis found that in order to reduce the mobile behavior of the activities that they are doing should make the environment with the window size of eye level from 6.50 to 7.0 $m^2$ and if the behavior of looking other things is wanted to reduce while doing the activities should make the environment with the window size in eye level from 2.0-2.5$m^2$.

From the above study is related to the literature study which says that the environment of class room that have too many door will make the student want to walk out from the room. Having too many windows will make the student to be distracted because students will look through the window often (ผดุง อารยะวิญญู 2546). He said about the opening size, but he didn't mentioned how much of that size to be appropriated with the building of child concentration. This study gives more detail to know about the size of window in eye level because it is the stimulation that happen to the staring of child which conduct the size of window in 2 phases that affect to the different behavior, if the size of window is determined appropriately, size of window impacting on stimulation with each behavior should be considered thoroughtly. Even if small window will less cause of looking at other things but small window will more cause to behavior of walking out of the activities that they are doing. This will cause the motivating child to return to the activities is more difficult than the happening the behavior of looking other things, so from the study of this direction, the design of window size that is suitable to reduce impaired information processing sensory stimuli, perceptions, and learning disabilities **should have the window size in eye level between 6.50-7.0 $m^2$**.

6) The window size compare to the size of room

Environmental aspects to consider the proportion of window size compare to the size of room from the analysis found that in order to reduce the mobile behavior of the activities that they are doing should make the environment with the window size of eye level is 10 percent and if the behavior of looking other things is intended to reduce while doing the activities should make the environment with the window size of eye level is 4 percent compare to the size of room.

From the study above is related to the literature study which say that the environment of class room that have too many door will make the student want to walk out from the room. Having too many windows will make the student to be distracted because students will look through the windows often (ผดุง อารยะวิญญู 2546). It is focused on the window size, but it does not mention how much proportion is which will generate an appropriation with concentration making of child. This study gives more details to know about the proportion of opening of eye level which conducts the proportion of window size in 2 sizes that affect to the different behaviors; if the appropriate proportion of window size is determined, it is important that proportion of window size impacting on stimulation with each behavior should be considered. Even if the small proportion of window will less cause of looking at other things but small proportion of window will more cause to behavior of walking out of the activities that they are doing. This will cause the motivating child to return to the activities is more difficult than the happening the behavior of looking other things, so from consideration with above main reason, the factor type of **proportion of window size of eye level that is suitable to reduce defect should have proportion 10 percent compare to the size of room** to reduce impaired information processing sensory stimuli, perceptions, and learning disabilities.

7) Things that are seen outside the window

Environmental aspects considering about the things that are seen outside the window, from the analysis, found that in order to reduce the behavior of looking other things while doing the activities should provide the views of sensational sense and comfortable sense in the same environment.

From the study above which is related to the literature study which says the environments of class room that have too many doors will make the student want to walk out from the room. Having too many windows will make the student to be distracted because students will look through the window often (ผดุง อารยะวิญญู 2546). It is said about the number of windows, but it does not mention about how those things seen outside the window are characterized between the views of sensational sense, overlooking sense or should have both types in the same environment which is appropriated with the stimulation making of child. Therefore, this research is supplementary research to know about the characteristic of things that are seen

outside the windows which found that the **arrangement should have views of sensational sense and comfortable sense in the same environment that will be the good effect for reducing the behavior of looking other things beside the child's activities that they are doing** that can reduce impaired information processing sensory stimuli, perceptions, and learning disabilities.

8) The distance from the equipment storage

Environmental aspects considering about the distance from the equipment storage from the analysis found that in order to reduce the behavior of looking other things while doing the activities should prepare the seat for doing activities of child from the equipment storage have distance of 2.2m.

From the above finding that is related to the literature study which addresses the preparation of material and teaching equipment should be closed to teacher, so teacher can reach it without walking, because if teacher walk to it, children will be diverted to anything else, and it will make the teacher to be difficult to take the student concentration back. Moreover, the equipment should be neatly put for activities on the shelf or on the closet for children to be not confused (ผดุง อารยะวิญญู 2546 และอุมาพร ตรังคสมบัติ 2545). They said the behavior of walking to take the equipment and teaching equipment should have been prepared, because it effects stimulation of children. However, in this study gives more details about the distance between the equipment storage and the align seat of children for doing activities. Due to the importance of behavior which go to take the equipment of teacher create the observation that teacher or teacher assistant have the taking additional equipment during the activities or in some activities , teacher go to pick up the equipment for other student while some student already begin to do activities. So it will disturb the concentration and child will divert the interest while teacher is preparing the equipment. Therefore, the distance of seat from the equipment storage should be studied on how much distance should be to be appropriated for reducing of attitude that hampers the activities development. The result from research showed that **it is important to arrange the seat for doing the development activities of autistic children from the equipment storage at the distance of 2.2m in order to reduce the behavior of looking other things while doing the activities.**

9) The division of internal space

Environmental aspects considering the division of internal space from the analysis found that in order to reduce the mobile behavior of the activities that they are doing, the environment should be designed with no division of area. If the behavior of looking other things is needed to reduce while doing the activities, the areas should be separated.

From the above finding related to the literature study which states that with or without the division of internal classroom has impacts on the meditation of children by the division of space or the division of particularized class room, using the corner of the room to train or decorate the curtain for hiding from the eyes to avoid interference from other stimulation, because that stimulation will make the student loss their concentration in studying (อุมาพร ตรังคสมบัติ 2545). Moreover, using simple wall for causing not interference from other stimulation and the division space which can reduce the incentive that contribute to the perceived provocation too much will make the student to be stress, fear, distracted, and will make studying to be stumble down (Susan Stokes referenced by ผดุง อารยะวิญญู 2546).

From the literature study above identified about the division of space will impact to the studying meditation, but this study didn't study about the some kinds of impact to behavior that hamper to student learning. Therefore, this research already studied and found that the environment that have division of the space or don't have division of the space have impact to different behavior by supporting the previous literature study, in term of reducing the behavior of looking other things while doing the activities should have the separated area. But opposite to the literature in the issue of reducing the mobile behavior of the activities that they are doing, it should not have the area division.

The characteristics of fitted internal space division can be summarized that the characteristic of internal space division or without internal space division should be considered carefully on which characteristics impacting on the behavior impede the activities the most.

Form the above result, in this issue need to consider about behaviors that hamper the activities the most. After consideration, it was found that the mobile

behavior from the activities that they are doing is the behavior whether it happens; it will encourage the child to return to the activities more difficult than the behavior of looking other things during doing activities. Thus, the characteristics of environment should be the characteristics which cause the less happening of mobile habit from the doing activities as well. The physical environment should not be existed of the division of internal space, which the conclusion of this issue should be related to the study of flexibility of internal space that shows if the mobile behavior of the activities that they are doing is intended to reduce. The environment should have flexible characteristics for using. Therefore, **there has not space division, in so, to have appropriation and according to reduction** the impaired information processing sensory stimuli, perceptions, and learning disabilities.

Perception of audio impairment can be reduced by the factor of physical environment factors in 4 sub-factors including 1) the distance between each classroom, 2) Characteristics of the distance of a classroom to the others, 3) design of corridor outside classroom, and 4) the use of sound devices in classroom. These 4 factors have effected to 2 behaviors including the mobile behavior and the behavior of looking other things besides the doing activities.

1. The distance between each classroom

To consider the distance between each classroom, it needs to use environmental factors, which from the analysis of data discovered that if reducing of conduct movement is needed from the current doing activity to another, the classrooms have to be adjacent. Moreover, if there is a need to see or view other objects or activities a part from the current doing activity, the distance between the classrooms needs to be 5 meters.

From the discovery above, there is linkage with the literature study which shows that the disturbing noise is the factor that makes the concentration of the student decrease. Moreover, the factors created the disturbing sound are the adjacent classrooms, and the classroom that located near the corridor which can cause the noise to come inside the classrooms (ผดุง อารยะวิญญู 2546). However, from the study of literature, there is no specification detail that the other classrooms which located different from the description above have less disturbing sound between classrooms.

As a result, the topic of the distances between each classroom is very essential and interesting for further study.

According to the result of the research, it indicates that there are 2 environmental factors that have different effects, which can conclude the result and provide the detail of environmental factors in this topic. To consider about this topic, it need to use along with literature that indicates the adjacent classrooms will have effects on creating disturbing sound in classrooms in which is opposed to the analysis result of the subject of reducing the habit of a move away from activities that do exist; however, tally with the analysis result of subject of reducing the habit of viewing other objects apart from the current doing activity. Because, the rest of the result will use to confirm literature study which can identify that the subject of the distance between each classroom, **need to be construct as the classrooms that have distance of 5 meters between each of them in order to reduce faultily of autistic child** which be able to reduce the deficient of evaluation of the psychological perception alliterate in accepting and learning which lead to the faultily.

2. Characteristics of the distance of a classroom to others

The characteristics in term of environment that considers about distance between each classroom, from the data analysis discover that if there is a need to reduce the movement behaviors from the current doing activity of autistic child, it should have a corridor and free space between the classroom. Moreover, if there is a need to reduce the behavior of view other things a part from the current doing activity, it should have the wall between classrooms.

From the discoveries above, there is a relationship with literature which stated that the distance between classrooms affect autistic child due to the fact that the disturbing sound is the reason that cause the students' concentration decrease. Furthermore, the factors that cause the disturbing sound in other place are the adjacent classrooms and classroom that located next to corridor which made the disturbing sound come into the classroom (ผดุง อารยะวิญญู 2546). In addition, from the literature above can show the important of the issue, characteristic of the distance from one classroom to another which there are some other factors that can answer

whether disturb or not between the classrooms and will influent the behavior of expression of autistic child in other characteristic.

The results show the environment characteristic in 2 kinds that have different effect which will conclude the result for indicate the detail of characteristics environmental factor in this topic need to consider along with the literature that stated the adjacent classroom will make the disturbing sound come into the class and classroom that located near corridor will have disturbing sound come in which tally with the result of the analysis of the subject related to reducing the behavior of a move away from activities that do exist that the sound from adjacent classroom will cause the behavior of a move away from activities that do exist to increase, so It should be designed to provide space between the corridors and rooms. However, it is opposed to the subject of reducing behaviors of view other things other than the current doing activity by it needs to make the space between classroom enough to sit but if consider about the deficient factors which the impaired audio stimuli is important, so in this topic, **it should consider to make classrooms have distance between each ones while having corridor and free space at the same time.** Moreover, it is also consistent with topic of distance between classrooms which summarize that it needs to have space or distance between classrooms in 5 meters both of these factors can be linked together because the relevance in the topic of distance between each classroom.

3. Design of corridor outside classroom

Characteristics of environmental factor that consider the characteristic of corridor outside classroom from the data analysis show that if there is a need of reducing the behavior of a move away from activities that do exist, it should have characteristic corridor outside classroom that feature as main corridor and separated subordinate corridor. Furthermore, if there is a need of behavior of viewing other thing apart from the existed activity to decrease, it should organize the feature of corridor outside the classroom as empty space.

From the discovery above has relevant to literature that stated disturbing sound should be the cause of decreasing the concentrate of the kids and factors root of disturbing sound in the area are adjacent classrooms and classrooms that located

near corridor which make the disturbing sound come in to classroom (ผดุง อารยะวิญญู 2546). In addition, from the literature above can show the important of the study about the topic of design of corridor outside classroom that the other features of corridor outside classroom which be able to state that it has disturbing in term of sound a lot or just a little and will affects the behavior of the expression of autistic child in other manner.

The result of data analysis shows the environment characteristics in 2 kinds that influent differently are the corridors outside classroom that have both main corridor and separated subordinate corridor, used for reducing the behavior of a move away from activities that do exist along with corridor outside classroom that features as empty free space, for reducing the behavior viewing other things apart from the existing activity. As a result, if we want to conclude the result to know the detail of characteristics of the surrounding of this topic, it needs to consider that reaction that already happen will inhibit the activity more and lead to return to do the activity more difficult, it means that The behavior of a move away from activities that do exist have influence on activity more than the behavior of viewing other thing apart from existing activity. Consequently, if we use principle of analysis above can be conclude that **design of corridor outside classroom should have features as main corridor and subordinate corridor all together,** so it will be able to reduce the deficient of the collection of data in term of psychological perception alliterate in accepting and learning which lead to the faultily.

4. The use of sound devices in classroom

Characteristics of environmental factor that consider the characteristic of corridor outside classroom from the data analysis discover that if there is a need of reducing the behavior of a move away from activities that do exist of autistic child, in classroom, there should have a correct use of sound devices. Furthermore, if there is a need of behavior of viewing other thing apart from the existed activity to decrease, there should not use any sound device in classroom.

From the discovery above has relevant to literature that stated the ways of using sound device in classroom or not have effects to autistic child such as turn off the mobile phone loud sound radio or turn off all the time or using electronic device

are provocation that are too much for autistic child wherewith it does not help the development of social interaction because child will concentrate on electronic devices more than people, so there is a need to consider about how to use electronic devices is enough or not or any electronic device (ผดุง อารยะวิญญู 2546).From reviewing the literature, it identified the use of many kinds of electronic device and the period of using that device which is the motivation to kid but from the 6 kinds of environment factor that choose to study of the use of only one electronic device, sound device that use along with development activity which are the study focus on only sound devices and record the result of the study in 2 ways. From the question recorded in literature stated that, electronic devices are important or not, so from the study of the use of electronic devices is only for doing activity which indicate ability to conclude that **there should use sound devices in the environment factor that are suitable for the kind of activity in order to reduce the move away habit from activity that does exist** but will create the behavior of viewing other thing apart from existing activity that teacher may encourage children to enter the event easier. To make the move away habit from activity that does exist is the behaviors that stop activity of development more.

**From the third sub-question, a summary of the characteristics of environmental factors is divided into 2 parts which are actions perceived stimuli visually impaired and actions perceived provocation audio dysfunction which have detail as follow:**

Actions perceived stimuli visually impaired

There should not use pictures that are not related to learning and teaching but if there are pictures that are not related to the visual learning, it should have low level of complicity of the pictures or no any complicity. Moreover, there should be no hanging things in the classroom because it creates an unnecessary provocation to children.

The distance should be provided of the seat from the door to 4 meters, having size of openings at eyes level range of 6.50 to 7.0 square meters accounted for openings at eye level, 10 percent of the classroom size. Furthermore, the exterior view of the openings should stimulate feelings and senses in the same environment.

The development activities seats of autistic child should be organized away from storage devices at a distance of 2.2 m and should not have been delineated the internal area.

Actions perceived provocation audio dysfunction

Classrooms should be designed to address 5 meters apart from each other in exchange to reduce the symptoms of impaired of autistic child. There should be a design of geographical characteristics of the distance with a space between the corridors and rooms, which it should design the features of the corridor outside the classroom as the main corridor and the separated subordinate corridors.

The use of sound in the environment can follow the pattern of activity and to reduce the movement habits of doing things.

All these environmental characteristics can help in reducing impaired information processing sensory perception of stimuli and learning defects in a significant level.

**In addition, from the data analysis used to determines the relationship of defects of all three sides with all the physical environments, the analysis of covariance with the three characteristic behaviors of children with autism by using the statistical method found that variable behaviors of walking out of the room are not relevant or influenced by any environmental factors at any level of statistical significantly.**

### 5.2 Summary of research discoveries

A summary of the research discoveries summarized that there are the subject of three main issues of the research question which are as followings.

**The first main question:** What are the characteristics and behavior of children with autism of each group?

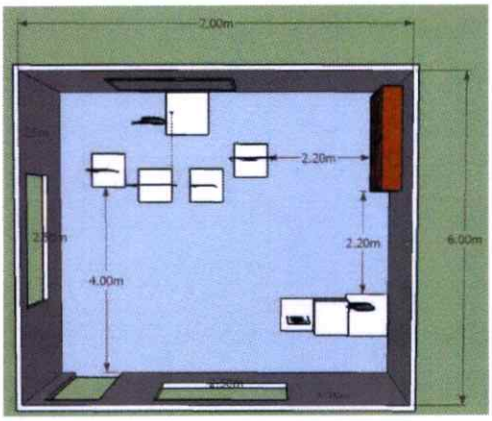
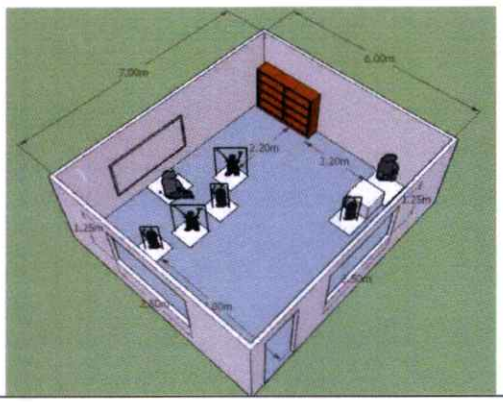
**The second main question:** What does the physical environment conducive to the development of activities for children with autism look like? The sub question 2.1 the physical environment in any manner that can reduce defective management dictates of children with autism have linked to the environment consists in two factors

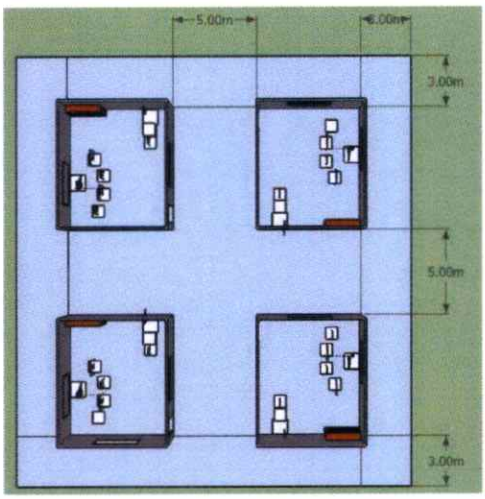
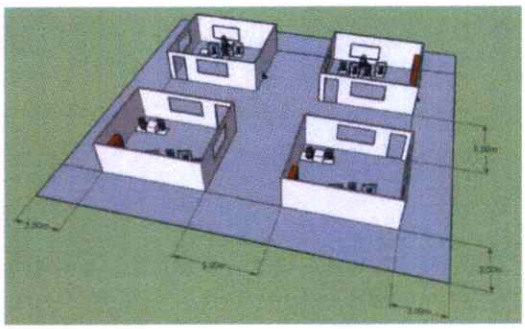
1) organize area in order base on its accessing 2) The use of symbols in sequence of activities. The sub question 2.2 Physical characteristics and activity can reduce impaired social information processing that children with autism have which linked to the environment consists of 4 factors 1) the size of space for doing activity of one autistic child 2) the capability of flexibility of the space 3) the distance between the seats of teachers to students. 4) The distance between the seats of teachers to students. The sub question 2.3 any type of environmental factors that can reduce impaired information processing sensory stimuli, perceptions, and learning disabilities by dividing the stimulus of perceived visually impaired and the perceived provocation audio dysfunction that is linked to the nature of the environment in the 13 factors that perceived stimuli visually impaired which relating to the characteristics of the environment in the 9 factors 1) the complexity of the images used to decorate the classroom environment 2) the decoration the classroom with things hanging 3) The distance from the window to seat 4) The distance of the seat from the door 5) size of openings at eye level 6) proportion of the size opening at visual level 7) things that are visible outside of openings 8) The distance from the storage device 9) the features of free area and the perceived provocation audio dysfunctions that related to the environmental characteristics in 4 factors 1) The distance from one classroom to another classroom. 2) The distance characteristic of one classroom to another classroom 3) the characteristics of corridor outside the classroom. 4) The use of sound devices inside classroom.

The entire discovery is shown in Table 5.2

**Table 5.2** Show the characteristics and behavior of children with autism of each group.

| Research questions | Research answers |
|---|---|
| **The first main question:** What might be the characteristics and behavior of children with autism of each group? | |
| The group of managing order dysfunction syndrome | Behaviors that induce children to start activities by teachers and conduct activities on their own. |
| The group of social information processing dysfunction syndrome | |

| Research questions | Research answers |
|---|---|
| The group of information processing sensory perception of stimuli, visual and learning to recognize the sound stimuli dysfunction syndrome | The movement habits of doing one existing activity and the behavior of viewing other things apart from existing activity. |
| **The second main question:** What the physical environment is conducive to the development of activities for children with autism look like? | |
| The sub question 2.1 the physical environment in any manner that can reduce defective management dictates of children with autism | - It should have set up an environment factors that suitable for complying with the order in which events occurred<br>- It should use symbols to show the sequence of involved activities |
| The sub question 2.2 Physical characteristics and activity can reduce impaired social information processing that children with autism have     | The physical environment status<br>- It should have size of the area while doing activities of children with autism which the distance between each child should be 0.50 square meters to 0.70 square meters.<br>- The area should be flexible according to usage<br>The interaction of people in the area:<br>- When there are group activities and individual activities, it should provide teachers with students sitting across from each other<br>- the space of the distance that separated between the seats of teachers and students in group activities should be at a distance of 1.21 meters to 1.50 meters<br>- The distance between the seats of teachers and students in individual activities should range between 0.00 m to 0.30 m.<br>- The distance between the seats of the teacher and students in activities in front of the board should be 1.20 meters |
| The sub question 2.3 any type of environmental factors that can reduce impaired information processing sensory stimuli, perceptions, and learning disabilities of children with autism. | The dysfunction of perceived visually<br>- Do not use images that are not related to the course of teaching and learning, though, if that are not involved pictures that are in the study in |

| Research questions | Research answers |
|---|---|
|  <br>  | level of visual, level of complexity should be low or no complexity at all<br>- There should not have any hanging things in the classroom because it creates an unnecessary provocation to children.<br>- It should provide the distance of from the seat to the door for 4 meters<br>- The size of openings at visual level in the range of 6.50 to 7.0 square meters<br>- The proportion of openings at visual level should be 10 percent of the classroom size<br>- Exterior view of the openings should stimulate and provide relaxed feeling within the same environment<br>- It should organize the seats for development activities of children with autism away from storage devices at a distance of 2.2 meters<br>- There should be no space within delineated<br>The perceived provocation audio dysfunction<br>- The design of classrooms should address 5 meters apart from each other<br>- It should design geographical characteristics of the distance with a space between the corridors and rooms<br>- It should design features of the corridor outside the classroom as the main corridor and the separated subordinate corridors.<br>- It should use sound devices in the environment that is suitable for the upcoming activities. |

The physical characteristics of environmental factors within the second main question are able to show overall view by using three-dimensional operators

### 5.3. Suggestion to research

The environment variables from the research literature review are environmental issues on the other sides which the research was not conducted due to the environment including the study of the comparing environmental factors and environmental factors that use fluorescent bulbs along with incandescent bulbs. Moreover, the study compared the use of fans and air conditioning which the study might be the new discovery that is used for the future knowledge development.

# APPENDIX

## Analysis Oneway ANOVA

**StepZone *VS* Induce to Activity**

ANOVA

| | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | 578.528 | 1 | 578.528 | 49.058 | .000 |
| Within Groups | 518.885 | 44 | 11.793 | | |
| Total | 1097.413 | 45 | | | |

**SignAct *VS* Induce to Activity**

ANOVA

| | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | 578.528 | 1 | 578.528 | 49.058 | .000 |
| Within Groups | 518.885 | 44 | 11.793 | | |
| Total | 1097.413 | 45 | | | |

**Flexible *VS* All Var.(10)**

ANOVA

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| Look at another Person | Between Groups | 8382.341 | 1 | 8382.341 | 19.687 | .000 |
| | Within Groups | 18734.615 | 44 | 425.787 | | |
| | Total | 27116.957 | 45 | | | |
| Look Out by the Door direction | Between Groups | 812.310 | 1 | 812.310 | 7.323 | .010 |
| | Within Groups | 4880.646 | 44 | 110.924 | | |
| | Total | 5692.957 | 45 | | | |
| Look All Around when Teacher Move | Between Groups | 148.389 | 1 | 148.389 | 7.663 | .008 |
| | Within Groups | 852.046 | 44 | 19.365 | | |
| | Total | 1000.435 | 45 | | | |

**Complicate of Decorate *VS* All Var. (10)**

ANOVA

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| Look at another Person | Between Groups | 8201.668 | 3 | 2733.889 | 6.070 | .002 |
| | Within Groups | 18915.288 | 42 | 450.364 | | |
| | Total | 27116.957 | 45 | | | |
| Look all Around | Between Groups | 1262.033 | 3 | 420.678 | 3.624 | .021 |
| | Within Groups | 4875.119 | 42 | 116.074 | | |
| | Total | 6137.152 | 45 | | | |
| Look Out by the Door direction | Between Groups | 1055.859 | 3 | 351.953 | 3.188 | .033 |
| | Within Groups | 4637.098 | 42 | 110.407 | | |
| | Total | 5692.957 | 45 | | | |
| Turn to Person's Sound (Inside) | Between Groups | 892.148 | 3 | 297.383 | 12.179 | .000 |
| | Within Groups | 1025.504 | 42 | 24.417 | | |
| | Total | 1917.652 | 45 | | | |
| Turn to Other's Sound (Outside) | Between Groups | 292.244 | 3 | 97.415 | 7.817 | .000 |
| | Within Groups | 523.409 | 42 | 12.462 | | |
| | Total | 815.652 | 45 | | | |

**Mobile Decoration *VS* All Var. (10)**

ANOVA

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| Look at another Person | Between Groups | 5932.957 | 1 | 5932.957 | 12.323 | .001 |
| | Within Groups | 21184.000 | 44 | 481.455 | | |
| | Total | 27116.957 | 45 | | | |
| Turn to Person's Sound (Inside) | Between Groups | 464.700 | 1 | 464.700 | 14.073 | .001 |
| | Within Groups | 1452.952 | 44 | 33.022 | | |
| | Total | 1917.652 | 45 | | | |
| Turn to Other's Sound (Outside) | Between Groups | 102.326 | 1 | 102.326 | 6.312 | .016 |
| | Within Groups | 713.326 | 44 | 16.212 | | |
| | Total | 815.652 | 45 | | | |
| Look All Around when Teacher Move | Between Groups | 187.863 | 1 | 187.863 | 10.173 | .003 |
| | Within Groups | 812.571 | 44 | 18.468 | | |
| | Total | 1000.435 | 45 | | | |

**Type of Out Side View *VS* All Var. (10)**

ANOVA

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| Move to the Door | Between Groups | 1.987 | 1 | 1.987 | 5.073 | .029 |
| | Within Groups | 17.231 | 44 | .392 | | |
| | Total | 19.217 | 45 | | | |
| Look at another Person | Between Groups | 3594.309 | 1 | 3594.309 | 6.723 | .013 |
| | Within Groups | 23522.648 | 44 | 534.606 | | |
| | Total | 27116.957 | 45 | | | |

**Separate area *VS* All Var. (10)**

ANOVA

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| Look at another Person | Between Groups | 8382.341 | 1 | 8382.341 | 19.687 | .000 |
| | Within Groups | 18734.615 | 44 | 425.787 | | |
| | Total | 27116.957 | 45 | | | |
| Look Out by the Door direction | Between Groups | 812.310 | 1 | 812.310 | 7.323 | .010 |
| | Within Groups | 4880.646 | 44 | 110.924 | | |
| | Total | 5692.957 | 45 | | | |
| Look All Around when Teacher Move | Between Groups | 148.389 | 1 | 148.389 | 7.663 | .008 |
| | Within Groups | 852.046 | 44 | 19.365 | | |
| | Total | 1000.435 | 45 | | | |

**Type of Room Distance *VS* All Var. (10)**

ANOVA

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| Look at another Person | Between Groups | 8382.341 | 1 | 8382.341 | 19.687 | .000 |
| | Within Groups | 18734.615 | 44 | 425.787 | | |
| | Total | 27116.957 | 45 | | | |
| Look Out by the Door direction | Between Groups | 812.310 | 1 | 812.310 | 7.323 | .010 |
| | Within Groups | 4880.646 | 44 | 110.924 | | |
| | Total | 5692.957 | 45 | | | |
| Look All Around when Teacher Move | Between Groups | 148.389 | 1 | 148.389 | 7.663 | .008 |
| | Within Groups | 852.046 | 44 | 19.365 | | |
| | Total | 1000.435 | 45 | | | |

**Type of Corridor *VS* All Var. (10)**

ANOVA

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| Look at another Person | Between Groups | 8721.579 | 3 | 2907.193 | 6.638 | .001 |
| | Within Groups | 18395.377 | 42 | 437.985 | | |
| | Total | 27116.957 | 45 | | | |
| Look All Around when Teacher Move | Between Groups | 167.827 | 3 | 55.942 | 2.822 | .050 |
| | Within Groups | 832.608 | 42 | 19.824 | | |
| | Total | 1000.435 | 45 | | | |

**Use Radio *VS* All Var. (10)**

ANOVA

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| Look at another Person | Between Groups | 8382.341 | 1 | 8382.341 | 19.687 | |
| | Within Groups | 18734.615 | 44 | 425.787 | | |
| | Total | 27116.957 | 45 | | | |
| Look Out by the Door direction | Between Groups | 812.310 | 1 | 812.310 | 7.323 | |
| | Within Groups | 4880.646 | 44 | 110.924 | | |
| | Total | 5692.957 | 45 | | | |
| Look All Around when Teacher Move | Between Groups | 148.389 | 1 | 148.389 | 7.663 | |
| | Within Groups | 852.046 | 44 | 19.365 | | |
| | Total | 1000.435 | 45 | | | |

# T-Test

## ลำดับพื้นที่-พฤติกรรมชักจูง เริ่มกิจกรรมได้เอง

**Group Statistics**

| | Step Zone of Activities | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Induce to Activity | none | 26 | 14.65 | 3.720 | .729 |
| | have | 20 | 7.50 | 3.017 | .675 |
| Start Activity by oneself | none | 26 | 6.54 | 2.874 | .564 |
| | have | 20 | 11.30 | 4.414 | .987 |

Independent Samples Test

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| Induce to Activity | Equal variances assumed | 1.842 | .182 | 7.004 | 44 | .000 | 7.154 | 1.021 | 5.095 | 9.212 |
| | Equal variances not assumed | | | 7.199 | 43.847 | .000 | 7.154 | .994 | 5.151 | 9.157 |
| Start Activity by oneself | Equal variances assumed | 5.470 | .024 | -4.422 | 44 | .000 | -4.762 | 1.077 | -6.932 | -2.592 |
| | Equal variances not assumed | | | -4.189 | 30.912 | .000 | -4.762 | 1.137 | -7.080 | -2.443 |

## การใช้สัญลักษณ์บอกลำดับกิจกรรม-พฤติกรรมชักจูง เริ่มกิจกรรมได้เอง

**Group Statistics**

| | Signess of Activities | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Induce to Activity | none | 26 | 14.65 | 3.720 | .729 |
| | have | 20 | 7.50 | 3.017 | .675 |
| Start Activity by oneself | none | 26 | 6.54 | 2.874 | .564 |
| | have | 20 | 11.30 | 4.414 | .987 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| Induce to Activity | Equal variances assumed | 1.842 | .182 | 7.004 | 44 | .000 | 7.154 | 1.021 | 5.095 | 9.212 |
| | Equal variances not assumed | | | 7.199 | 43.847 | .000 | 7.154 | .994 | 5.151 | 9.157 |
| Start Activity by oneself | Equal variances assumed | 5.470 | .024 | -4.422 | 44 | .000 | -4.762 | 1.077 | -6.932 | -2.592 |
| | Equal variances not assumed | | | -4.189 | 30.912 | .000 | -4.762 | 1.137 | -7.080 | -2.443 |

ตำแหน่งที่นั่งระหว่างครูกับนร. (กลุ่ม) – 3Factor

**Group Statistics**

| | Seat Between Teacher and Student in Group Activity | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Move | beside | 35 | 8.48 | 8.870 | 1.499 |
| | opposite | 11 | 2.83 | 3.060 | .923 |
| Look | beside | 35 | 14.17 | 15.091 | 2.551 |
| | opposite | 11 | 19.36 | 8.608 | 2.595 |
| GoOut | beside | 35 | .49 | 1.011 | .171 |
| | opposite | 11 | 2.00 | 5.441 | 1.640 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| Move | Equal variances assumed | 4.886 | .032 | 2.059 | 44 | .045 | 5.646 | 2.742 | .121 | 11.172 |
| | Equal variances not assumed | | | 3.207 | 43.445 | .003 | 5.646 | 1.760 | 2.097 | 9.195 |
| Look | Equal variances assumed | .947 | .336 | -1.083 | 44 | .285 | -5.197 | 4.800 | -14.870 | 4.476 |
| | Equal variances not assumed | | | -1.428 | 30.326 | .163 | -5.197 | 3.639 | -12.626 | 2.232 |
| GoOut | Equal variances assumed | 11.959 | .001 | -1.598 | 44 | .117 | -1.514 | .948 | -3.424 | .396 |
| | Equal variances not assumed | | | -.918 | 10.218 | .380 | -1.514 | 1.649 | -5.179 | 2.150 |

ตำแหน่งที่นั่งระหว่างครูกับนร. (เดี่ยว) – 3Factor

**Group Statistics**

| | Seat Between Teacher and Student Single Activity | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Move | free | 20 | 11.44 | 10.476 | 2.343 |
| | opposite | 26 | 3.81 | 3.425 | .672 |
| Look | free | 20 | 7.10 | 4.540 | 1.015 |
| | opposite | 26 | 21.80 | 15.330 | 3.006 |
| GoOut | free | 20 | .75 | 1.209 | .270 |
| | opposite | 26 | .92 | 3.588 | .704 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| Move | Equal variances assumed | 17.523 | .000 | 3.486 | 44 | .001 | 7.623 | 2.187 | 3.215 | 12.030 |
| | Equal variances not assumed | | | 3.128 | 22.138 | .005 | 7.623 | 2.437 | 2.570 | 12.675 |
| Look | Equal variances assumed | 8.260 | .006 | -4.142 | 44 | .000 | -14.701 | 3.549 | -21.855 | -7.548 |
| | Equal variances not assumed | | | -4.633 | 30.505 | .000 | -14.701 | 3.173 | -21.177 | -8.225 |
| GoOut | Equal variances assumed | .655 | .423 | -.206 | 44 | .837 | -.173 | .838 | -1.863 | 1.517 |
| | Equal variances not assumed | | | -.230 | 32.002 | .820 | -.173 | .754 | -1.708 | 1.362 |

ตำแหน่งที่นั่งระหว่างครูกับนร. (กลุ่ม) – 3Factor

**Group Statistics**

| | Seat Between Teacher and Student in Group Activity | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Move | beside | 35 | 8.48 | 8.870 | 1.499 |
| | opposite | 11 | 2.83 | 3.060 | .923 |
| Look | beside | 35 | 14.17 | 15.091 | 2.551 |
| | opposite | 11 | 19.36 | 8.608 | 2.595 |
| GoOut | beside | 35 | .49 | 1.011 | .171 |
| | opposite | 11 | 2.00 | 5.441 | 1.640 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| Move | Equal variances assumed | 4.886 | .032 | 2.059 | 44 | .045 | 5.646 | 2.742 | .121 | 11.172 |
| | Equal variances not assumed | | | 3.207 | 43.445 | .003 | 5.646 | 1.760 | 2.097 | 9.195 |
| Look | Equal variances assumed | .947 | .336 | -1.083 | 44 | .285 | -5.197 | 4.800 | -14.870 | 4.476 |
| | Equal variances not assumed | | | -1.428 | 30.326 | .163 | -5.197 | 3.639 | -12.626 | 2.232 |
| GoOut | Equal variances assumed | 11.959 | .001 | -1.598 | 44 | .117 | -1.514 | .948 | -3.424 | .396 |
| | Equal variances not assumed | | | -.918 | 10.218 | .380 | -1.514 | 1.649 | -5.179 | 2.150 |

ตำแหน่งที่นั่งระหว่างครูกับนร. (เดี่ยว) – 3Factor

**Group Statistics**

| | Seat Between Teacher and Student Single Activity | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Move | free | 20 | 11.44 | 10.476 | 2.343 |
| | opposite | 26 | 3.81 | 3.425 | .672 |
| Look | free | 20 | 7.10 | 4.540 | 1.015 |
| | opposite | 26 | 21.80 | 15.330 | 3.006 |
| GoOut | free | 20 | .75 | 1.209 | .270 |
| | opposite | 26 | .92 | 3.588 | .704 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| Move | Equal variances assumed | 17.523 | .000 | 3.486 | 44 | .001 | 7.623 | 2.187 | 3.215 | 12.030 |
| | Equal variances not assumed | | | 3.128 | 22.138 | .005 | 7.623 | 2.437 | 2.570 | 12.675 |
| Look | Equal variances assumed | 8.260 | .006 | -4.142 | 44 | .000 | -14.701 | 3.549 | -21.855 | -7.548 |
| | Equal variances not assumed | | | -4.633 | 30.505 | .000 | -14.701 | 3.173 | -21.177 | -8.225 |
| GoOut | Equal variances assumed | .655 | .423 | -.206 | 44 | .837 | -.173 | .838 | -1.863 | 1.517 |
| | Equal variances not assumed | | | -.230 | 32.002 | .820 | -.173 | .754 | -1.708 | 1.362 |

ความสามารถในการยืดหยุ่นพื้นที่ – 3Factor

**Group Statistics**

| | Flexible in the Area | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Move | Can not | 20 | 11.44 | 10.476 | 2.343 |
| | Can | 26 | 3.81 | 3.425 | .672 |
| Look | Can not | 20 | 7.10 | 4.540 | 1.015 |
| | Can | 26 | 21.80 | 15.330 | 3.006 |
| GoOut | Can not | 20 | .75 | 1.209 | .270 |
| | Can | 26 | .92 | 3.588 | .704 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| Move | Equal variances assumed | 17.523 | .000 | 3.486 | 44 | .001 | 7.623 | 2.187 | 3.215 | 12.030 |
| | Equal variances not assumed | | | 3.128 | 22.138 | .005 | 7.623 | 2.437 | 2.570 | 12.675 |
| Look | Equal variances assumed | 8.260 | .006 | -4.142 | 44 | .000 | -14.701 | 3.549 | -21.855 | -7.548 |
| | Equal variances not assumed | | | -4.633 | 30.505 | .000 | -14.701 | 3.173 | -21.177 | -8.225 |
| GoOut | Equal variances assumed | .655 | .423 | -.206 | 44 | .837 | -.173 | .838 | -1.863 | 1.517 |
| | Equal variances not assumed | | | -.230 | 32.002 | .820 | -.173 | .754 | -1.708 | 1.362 |

การตกแต่งห้องด้วยสิ่งห้อยแขวน – 3Factor

**Group Statistics**

| | Mobile Decoration | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Move | none | 21 | 11.45 | 9.770 | 2.132 |
| | have | 25 | 3.50 | 4.105 | .821 |
| Look | none | 21 | 8.06 | 4.307 | .940 |
| | have | 25 | 21.58 | 16.142 | 3.228 |
| GoOut | none | 21 | .33 | .856 | .187 |
| | have | 25 | 1.28 | 3.680 | .736 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| Move | Equal variances assumed | 9.616 | .003 | 3.705 | 44 | .001 | 7.952 | 2.146 | 3.626 | 12.278 |
| | Equal variances not assumed | | | 3.480 | 25.897 | .002 | 7.952 | 2.285 | 3.255 | 12.649 |
| Look | Equal variances assumed | 9.709 | .003 | -3.721 | 44 | .001 | -13.517 | 3.632 | -20.836 | -6.197 |
| | Equal variances not assumed | | | -4.020 | 28.000 | .000 | -13.517 | 3.362 | -20.404 | -6.629 |
| GoOut | Equal variances assumed | 3.981 | .052 | -1.151 | 44 | .256 | -.947 | .822 | -2.604 | .711 |
| | Equal variances not assumed | | | -1.247 | 27.059 | .223 | -.947 | .759 | -2.505 | .611 |

## สิ่งที่มองเห็นนอกช่องเปิด – 3Factor

**Group Statistics**

| | Type of Out Side View | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Move | Active View | 33 | 5.41 | 5.422 | .944 |
| | Active & Passive | 13 | 11.49 | 12.072 | 3.348 |
| Look | Active View | 33 | 18.45 | 15.127 | 2.633 |
| | Active & Passive | 13 | 7.69 | 5.068 | 1.405 |
| GoOut | Active View | 33 | .94 | 3.220 | .561 |
| | Active & Passive | 13 | .62 | 1.193 | .331 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| Move | Equal variances assumed | 9.800 | .003 | -2.378 | 44 | .022 | -6.088 | 2.560 | -11.247 | -.928 |
| | Equal variances not assumed | | | -1.750 | 13.950 | .102 | -6.088 | 3.479 | -13.551 | 1.376 |
| Look | Equal variances assumed | 4.963 | .031 | 2.495 | 44 | .016 | 10.757 | 4.312 | 2.066 | 19.448 |
| | Equal variances not assumed | | | 3.604 | 43.430 | .001 | 10.757 | 2.985 | 4.739 | 16.775 |
| GoOut | Equal variances assumed | .552 | .462 | .351 | 44 | .727 | .324 | .922 | -1.534 | 2.183 |
| | Equal variances not assumed | | | .498 | 43.954 | .621 | .324 | .651 | -.988 | 1.636 |

## ลักษณะการแบ่งพื้นที่ – 3Factor

**Group Statistics**

| | Separate area | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Move | no | 26 | 3.81 | 3.425 | .672 |
| | yes | 20 | 11.44 | 10.476 | 2.343 |
| Look | no | 26 | 21.80 | 15.330 | 3.006 |
| | yes | 20 | 7.10 | 4.540 | 1.015 |
| GoOut | no | 26 | .92 | 3.588 | .704 |
| | yes | 20 | .75 | 1.209 | .270 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| Move | Equal variances assumed | 17.523 | .000 | -3.486 | 44 | .001 | -7.623 | 2.187 | -12.030 | -3.215 |
| | Equal variances not assumed | | | -3.128 | 22.138 | .005 | -7.623 | 2.437 | -12.675 | -2.570 |
| Look | Equal variances assumed | 8.260 | .006 | 4.142 | 44 | .000 | 14.701 | 3.549 | 7.548 | 21.855 |
| | Equal variances not assumed | | | 4.633 | 30.505 | .000 | 14.701 | 3.173 | 8.225 | 21.177 |
| GoOut | Equal variances assumed | .655 | .423 | .206 | 44 | .837 | .173 | .838 | -1.517 | 1.863 |
| | Equal variances not assumed | | | .230 | 32.002 | .820 | .173 | .754 | -1.362 | 1.708 |

ลักษณะความห่างจากห้องอื่น – 3Factor

**Group Statistics**

| | Type of Room Distance | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Move | same wall | 20 | 11.44 | 10.476 | 2.343 |
| | corridor& space | 26 | 3.81 | 3.425 | .672 |
| Look | same wall | 20 | 7.10 | 4.540 | 1.015 |
| | corridor& space | 26 | 21.80 | 15.330 | 3.006 |
| GoOut | same wall | 20 | .75 | 1.209 | .270 |
| | corridor& space | 26 | .92 | 3.588 | .704 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| Move | Equal variances assumed | 17.523 | .000 | 3.486 | 44 | .001 | 7.623 | 2.187 | 3.215 | 12.030 |
| | Equal variances not assumed | | | 3.128 | 22.138 | .005 | 7.623 | 2.437 | 2.570 | 12.675 |
| Look | Equal variances assumed | 8.260 | .006 | -4.142 | 44 | .000 | -14.701 | 3.549 | -21.855 | -7.548 |
| | Equal variances not assumed | | | -4.633 | 30.505 | .000 | -14.701 | 3.173 | -21.177 | -8.225 |
| GoOut | Equal variances assumed | .655 | .423 | -.206 | 44 | .837 | -.173 | .838 | -1.863 | 1.517 |
| | Equal variances not assumed | | | -.230 | 32.002 | .820 | -.173 | .754 | -1.708 | 1.362 |

การใช้เครื่องเสียง – 3Factor

**Group Statistics**

| | Use Radio | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Move | no | 20 | 11.44 | 10.476 | 2.343 |
| | yes | 26 | 3.81 | 3.425 | .672 |
| Look | no | 20 | 7.10 | 4.540 | 1.015 |
| | yes | 26 | 21.80 | 15.330 | 3.006 |
| GoOut | no | 20 | .75 | 1.209 | .270 |
| | yes | 26 | .92 | 3.588 | .704 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| Move | Equal variances assumed | 17.523 | .000 | 3.486 | 44 | .001 | 7.623 | 2.187 | 3.215 | 12.030 |
| | Equal variances not assumed | | | 3.128 | 22.138 | .005 | 7.623 | 2.437 | 2.570 | 12.675 |
| Look | Equal variances assumed | 8.260 | .006 | -4.142 | 44 | .000 | -14.701 | 3.549 | -21.855 | -7.548 |
| | Equal variances not assumed | | | -4.633 | 30.505 | .000 | -14.701 | 3.173 | -21.177 | -8.225 |
| GoOut | Equal variances assumed | .655 | .423 | -.206 | 44 | .837 | -.173 | .838 | -1.863 | 1.517 |
| | Equal variances not assumed | | | -.230 | 32.002 | .820 | -.173 | .754 | -1.708 | 1.362 |

# AUTHOR BIOGRAPHY


| | |
|---|---|
| **Name** | NIPHATTHA NOIPRAWAT |
| **Date of Birth** | 13 September 1978 |
| **Address** | 665 Soi 18 On-Nuch 70/1 Prawat, Bangkok, Thailand 10250 |


## Education Background

**2001** Bachelor of Arts (Interior Design)

**2003** Master of Architecture (Interior Architecture) King Mongkut's Institute of Technology Ladkrabang, Thailand

**2016** Doctor of Architecture, Multidisciplinary Design Research King Mongkut's Institute of Technology Ladkrabang, Thailand

## Specialties and Practice Areas

Interior Design

Physical Environmental Design

## Work Experiences

2003 **Designer at Alan D Thumanon Int. Design Co.,Ltd. Bangkok,Thailand**

**2003-Present Lecturer at Mahasarakham University**