

THE IMPACT OF SCHOOL ENVIRONMENTAL FACTORS TO THE MOTOR DEVELOPMENT OF STUDENTS WITH AUTISM SPECTRUM DISORDER (ASD) IN PINAGLABANAN ELEMENTARY SCHOOL, SAN JUAN CITY

Hannah Lois Y. Pancho¹

Master of Arts in Education, Major in Special Education - St. Jude College, Manila, Philippines¹

hanpancho@gmail.com

Abstract: *Environment has a big impact to every child's development. It can affect their social, emotional or physical development. Thus, this study aims to determine the impact of the school environmental factors to the motor development of students with Autism Spectrum Disorder (ASD). The study is both descriptive and qualitative in nature. It restricted its respondents only to the administrator, SpEd teachers and parents/guardians of the students. And it has been limited to the use of self administered survey questionnaire and interview questionnaire. A cross sectional study design was utilized to determine the impact of the school environmental factors to the motor development of students with autism spectrum disorder (ASD) ages 5 to 12 years old that were under the school year 2013-2014 in Pinaglabanan Elementary School San Juan City, Philippines. Based on the summary of the impact of environmental factors on the motor development of students with autism assessed by the school administrators and SPED teachers it resulted with the average impact ($X = 2.3$) and likewise, the parents strongly agreed the same level of impact was also on the average, ($X = 2.66$), respectively. Given that, in Special Education the environmental factors should not be taken for granted. This should be included in the school's main priorities for improvement. The school administrator should review and check the different school environmental factors and its importance. The evaluation of the school environmental factors should be strengthened. Concrete evaluation of the motor skills of the students should then be done and properly documented.*

Keywords: school environment, motor development, Autism Spectrum Disorder (ASD)

INTRODUCTION

Environment has a big impact to every child's development. It can affect their social, emotional or physical development. Thus, giving an experientially rich environment should be considered for every child's optimum development. According to the Ecological theory, microsystem is the physical and social situations that directly affect a child and one of those is the school environment.

The school environment has a big impact to a child's physical development. Motor development is greatly affected especially because children spend most of their time in school. Factors found in school that can help improve a child's motor development that includes indoor and outdoor physical environment, resources and activities given by the teachers, child's peers in school, and number of hours spent in school which allows more opportunity for exposure. As such,

deprivation of these factors may delay a child's motor development.

Motor development is a step-by-step process. A child is born with basic motor abilities such as flexion and extension of extremities. A child then learns to turn his body from side to side, creep, stand, and walk. However, complex movements such as fine motor activities are learned through a combination of physical growth and developing it through practice and experiences. Motor skills development enables a child to do things and to enjoy life because through it, they can walk, run, write and enjoy their play. Without proper motor development, a child might struggle in any aspects in their lives or may not receive the appropriate amount of physical activity. Motor development is especially important to children with ASD wherein most of them are delayed with their motor skills. Delayed motor skills development greatly affects their lives

especially their interaction. By helping them develop their motor skills, it can also help improve their other symptoms such as their behaviours and social interaction.

Autism spectrum disorder (ASD) affects many children globally. According to World Health Organization (WHO) (2013), recent reviews estimate a global median prevalence of 62/10 000, that is one child in 160 has an autism spectrum disorder and subsequent disability. The number of children that have been diagnosed with Autism Spectrum Disorder has increased and is continuing to do so at a rapid rate (Pottie & Ingram, 2008).

According to the new DSM V criteria Autism Spectrum Disorder has persistent deficits in social communication and social interactions, restricted and repetitive patterns of behaviours, interests or activities. Some children with autism have problems in developing their motor skills such as throwing a ball, jumping and also holding a pen to write. These children who have problems in their motor development may have a hard to become independent because it may affect their daily living such as eating and cleaning their own selves.

Background of the Study

Pinaglabanan Elementary School of San Juan is known to be a regular school and later on Sped program was incorporated to their school.

By pursuing this study, many schools and professionals will be enlightened the importance of school environment to the motor development of students especially the students with autism spectrum disorder. They will be able to know what

areas of environment to improve for motor development of learners.

Theoretical Framework

Many theories have cited that environmental factors have significant implication in the motor development of a child. This study based its assumption on The Ecological Theory. This Ecological Theory uses a theoretical framework proposed by Bronfenbrenner (1995) that includes a strong environmental view of child development. He proposes that the child is influenced by five interactive and overlapping ecological systems. Microsystem is the setting in which the child lives. It is the physical and social situations with the family and peer group that directly affect the child. Mesosystem involves connections among the child's Microsystems that influence the child because of the relationships, such as the relations of the family experiences to school experiences and of family experiences to peer experiences. Exosystem involves the settings or situations that influence the child but in which the child does not necessarily have an active role. Macrosystem formed by the values, beliefs, and policies of society and culture. Chronosystem involves environmental events and transitions during life and sociohistorical conditions.

This study focused on the child's Microsystem wherein the main focus is in the impact of the school environmental factors which include the physical environment of the school (indoor & outdoor equipment), the teachers and peers to the motor development of the students with ASD.

Conceptual Framework

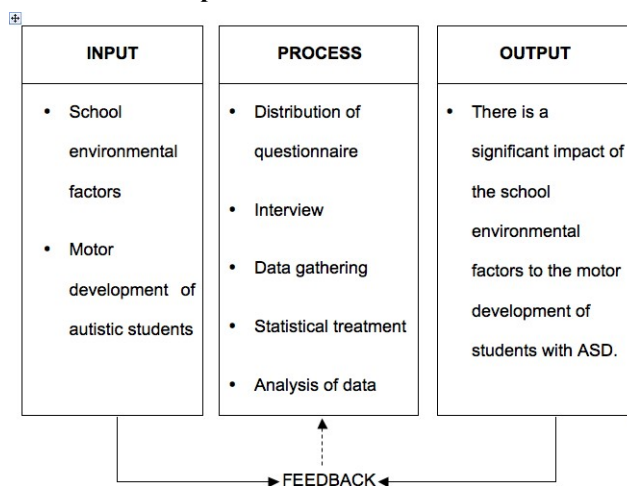


Figure 1. Conceptual Framework of the Study

Figure 1 is the schema of the study. The framework assumes that environment has an

impact on the motor development of the students with ASD.

Autism Spectrum Disorder is considered the fastest rising developmental disability in the world. The characteristics of Autism Spectrum Disorder range widely from individual to individual, but they tend to fall across different axes.

Motor skills delay is usually seen in children with Autism Spectrum Disorder (ASD) and it is commonly neglected. Motor skills delay may be a result of multiple interacting systems one of which is the lack of stimuli or sensorial experience from the environment.

Statement of the problem

This study aims to determine the impact of school environmental factors to the motor development of students with Autism Spectrum Disorder (ASD) ages 5-12 years old in Pinaglabanan Elementary School in San Juan .

Specifically, the study sought answers to the following questions:

How do the school administrators and teachers; and parents assess the school environmental factors to the motor development of students with ASD?

Is there a significant difference between the assessments of the school administrators and special education teachers, and parents as regard the influence of the school environmental factors to the motor development of student's with ASD?

From the findings of the study, what proposed instructional plan of action is offered to further enhance motor development of the students with ASD?

Scope and Limitation

The study limited itself to the students with autism spectrum disorder (ASD) of Pinaglabanan Elementary School in San Juan City ages 5-12 years old that were under the school year 2013-2014. Moreover, the study restricted its respondents only to the administrator, SpEd teachers and parents/guardians of the students since significant information of the school environmental factors may only be identified by them. The study limited itself to the use of survey and interview. Sets of survey questionnaire were distributed individually to the parents/guardians and to the SpEd Teachers/administrator of the students with autism spectrum disorder.

Significance of the study

This study is significant to the following:

First, to the administrators of educational institutions where there is a special program being implemented, specifically, at Pinaglabanan Elementary School in San Juan City. The findings will provide information that would be valuable in planning and improving their future school environment. Second, to the teachers of students

with autism, the results of this study will provide information and insights that may enhance their classroom environment, methods and techniques of teaching. Third, to the parents and guardians of the students with autism, the result of this study will make them aware and realize the significance of sending their children to a school with good environment. Fourth, to the students with autism spectrum disorder, the result of this study can help improve their school environment and it would be beneficial for them to improve their motor development.

Finally, to the SpEd practitioners and researchers, the outcome of the study may serve as a baseline data for future use in conceptualization of the school environment.

REVIEW OF RELATED LITERATURE AND STUDIES

Foreign Source

According to Mastrangelo, S. (2009), play is an important component of any child's education: It is through play that children learn about the world around them, test ideas, ask questions, and come up with answers. It is all the more important to provide ample opportunities for play for children with ASD, so they can begin to acquire the skills that will help them in other domains such as communication, reciprocity, and sensory processing.

Much of the play of children with ASD involves manipulating objects with which they are thoroughly familiar, parents, teachers, siblings, and friends can begin reciprocal interactions with objects that are of salience to the child. Play is a powerful way to teach a child with ASD, and the key to success is balancing developmental approach to play that encompasses some structure coupled with following the child's lead.

Researchers agree that play is a universal phenomenon, a culture that is unique to children, is most important to a child's development, and is a human right (Weider and Greenspan, 2003; Wolfberg, 2003). Play is also an avenue for children to explore, discover, solve problems, and master new skills (Quill, 2002; Westby, 2008; Wolfberg, 1999, 2003; Ziviani, Boyle, Rodeger, 2001). Specifically, children with ASD frequently enjoy playing activities and materials that involve physical, sensorial experiences such as running, jumping, spinning, and bouncing. Without directions from others, these children will most likely not engage in functionally appropriate play with objects (Wolfberg, 2003; Boucher and Wolfberg, 2003).

According to Hudson, Thompson and Mack play areas should include opportunities for the development of fundamental motor actions along with intellectual challenges to make choices of activities. If children are not given opportunities to

choose environmental conditions which will enhance their development, they will assume that there is only one way to use the environment or equipment.

In child care (2013), they mentioned that Play is crucial to the development of children's gross and fine motor skills. Through play, children practice and perfect control and coordination of large body movements, as well as small movements of hands and fingers. Child care providers can support young children's motor development by planning play activities that provide children with regular opportunities to move their bodies.

Sachs and Vicenta (2011) mentioned that, early intervention is one of the most important keys to improvement in autism symptoms - one reason why appropriate outdoor learning environments are crucial. All children learn and develop cognitively as well as physically through play, and a growing body of research points to the important role that nature plays in that development. Creating a supportive environment can go a long way in helping children with special needs experience the world in a meaningful way.

Likewise, Chawarska, Klin, and Volkmar(2008), in the developmental approaches, it recognizes that most learning in childhoods takes place in the social context of daily activities and experiences. Efforts to support a child's development occur with caregivers and familiar partners in everyday activities in a variety of social situations, and not primarily by working with a child in isolation. Natural environments are the everyday routines, activities, and places that are typical or natural for the family and usually include locations such as the home, child care facility, homes of extended family, and friends, and other community locations such as park or church.

Lisa Kurtz (2008) mentioned that repetition is an important concept in motor learning. She emphasized that new motor skills must be practiced, or rehearsed, in order to become strong, fluid, and well coordinated. Also, Kurtz gave suggestions for improving the motor planning skills such as expect that teaching new skills will require considerable practice and repetition, and may have to be re-taught periodically even after the child seems capable performing the task. Begin teaching session by first providing sensory experiences that help the child to be more aware of body sensations, or that offer vestibular or tactile sensation. This helps the child to be ready to "listen" to his or her body. The sensory cues, usually, tactile or visual, to help the child attend to selected aspects of the task. She also discussed the principles on how to help the child to develop fine motor control; these are: Help the child with exercises and activities that develop shoulder,

elbow, and wrist stability and engaged the child in activities that promote speed and ease of movement when using the fingers to manipulate small objects.

Children with Autism who are in a secure and supportive environment have indeed shown an improvement in their play behaviour. The children were observed to spend more time playing, have a higher level of play, and more symbolic play behaviour (Naber et al, 2003). Moreover, a safe and supportive environment is an important factor for children to learn and practice new skills (Boucher and Vygotsky cited in Jordan, 2003). These children in a secure relationship spend more time playing, have a higher level of play, and more symbolic play behaviour.

There is no single, universally best suited, and effective method of teaching children with ASD. Increasingly, it is clear that the best programs are those that integrate a variety of multidisciplinary best practices based on individual needs. Simpson (2004) wrote that a number of these methods have been recognized; hence, there is now a foundation core available to support basic effective practices for students with autism-spectrum disabilities. These alternatives include a range of strategies designed to develop skills in areas of deficit [e.g. structured teaching, Applied Behavior Analysis (ABA), Picture Exchange Communication System (PECS)], environmental supports and modifications (e.g. visual supports, routine), and biologically-based interventions and treatments (e.g., psychopharmacologic treatments). Unfortunately, these foundation elements are often nonexistent in many schools and community programs.

In order to promote generalization and maintenance of skills, teachers should use common materials for instruction. Materials that are frequently found in preschools and the homes of young children promote generalization. The teachers should design opportunities for children to practice with similar materials in order for children to learn how to demonstrate new behaviours with varied materials.

Local Source

Dizon (2000) came up with a book that specified principles and guidelines, goals and objectives, target skills and suggested activities, instructional strategies and sample lesson plans in the areas of behaviour management, psychosocial area, psychomotor area, cognition and communication area, reading area, quantitative area and activities of daily living, personal management, and livelihood. Curricular contents include: (a) gross motor skills, (b) physical fitness, (c) fine motor skills: pre-writing, (d) cognition, (e) receptive and non-verbal communication, (f) verbal communication, (g) written communication, (h)

word discrimination, (i) vocabulary building, (j) reading comprehension, (k) activities of daily living, (i) personal management, and (m) livelihood.

Ramon Aboitiz Foundation Inc. (RAFI) also wrote about Playgrounds for all, they said that playgrounds are important places for children. In playgrounds, children meet other children and learn how to share a common space. Playgrounds provide children with equipment where they can move in different ways, thereby developing their motor skills. Children also learn to assess situations and take on risk while navigating through a playground.

Research Method and Procedure

Research Method

A cross sectional study design was utilized to determine the impact of the school environmental factors to the motor development of students with autism spectrum disorder (ASD) ages 5 to 12 years

old in Pinaglabanan Elementary School San Juan City.

Respondents of the Study

The respondents of the present study were SpEd administrators/teachers and parents/guardians of students with ASD ages 5 to 12 years old presently enrolled in Pinaglabanan Elementary School. There are 11 students with ASD ages 5 to 12 years old enrolled in Pinaglabanan Elementary School. . As shown in Table 1, the researcher had requested one (1) school administrator, four (4) SpEd teachers, and eleven (11) parents/guardians to be the respondents of the study. Below is a tabular presentation to describe subject population. There were 31.25 percent of SpEd teachers and an administrator and 68.75 percent of parents. The School Administrator and SpEd teachers and parents comprised the two (2) major groups of respondents. They were chosen purposively and conveniently.

Table 1- Frequency Distribution of the Respondents of the Study in Pinaglabanan Elementary School, San Juan City

<i>RESPONDENTS</i>	<i>F</i>	<i>%</i>	<i>RANK</i>
<i>School Administrator/SpED</i>			
<i>Teachers</i>	5	31.25%	2
<i>Parents</i>	11	68.75%	1
<i>TOTAL</i>	16	100.00	

Teacher, administrator, and parents/ guardians of all students with ASD ages 5 to 12 years old were the subjects in this study.

Sampling Procedure

Purposive sampling was utilized in selecting the participants in the study. All teachers and parents of the registered students with autism spectrum disorder ages 5 to 12 years old in Pinaglabanan Elementary School were included and made subjects of the study.

Instrumentation:

Two instruments were used to gather data in the study: a self-administered questionnaire and an interview questionnaire. A self administered survey questionnaire was utilized to gather the much needed data in the study. The questionnaire was structured considering the different environments in the school measuring the impact to the motor development. Furthermore, in order to measure the degree of impact of the school environmental factors to the motor development, the following rating was formulated:

3-Great impact-signifies that the student has improved or has known 4-5 new skills from the start of the school year 2013 regardless if it is gross or fine motor skill.

2-Average impact-signifies that the student has improved or has known 2-3 new skills from the start of the school year 2013 regardless if it is gross or fine motor skill.

1-Minimal impact-signifies that the student has improved or has known 1 new skill from the start of the school year 2013 regardless if it is gross or fine motor skill.

0-No impact-signifies no impact of the school environment in any areas of motor development.

The questionnaire was presented in a Likert Scale, a self reporting instrument in which a format was the most applicable for the study since each choice is given a numerical value and the total score is presumed to indicate the belief in the question. An interview question on each of the factors was also prepared to assess the impact of the school environment which may not be described in the self administered questionnaire. Both the self-administered questionnaire and interview questionnaire were reviewed and assessed by the experts to determine the validity and reliability. Two experts were chosen for this activity; a coordinator from the Special Education Department; a Dean from the Education Department.

Research Procedure

The researcher sought the permission of the Division Superintendent of San Juan City and the principal of Pinaglabanan Elementary School to access the needed information in determining the students under study and locating their parents or guardians. With the permission granted, the researcher went to the SpEd teachers to orient them about the study and the data gathering procedure. The following data were acquired: names of the students; gender; grade level; parent's/guardian's name; address and contact number.

After gathering the pertinent information in selecting the students, purposive selection was done. The researcher then contacted all the parents/guardians of the selected subjects for survey schedules. The researcher considered the respondents' time availability, place of survey and convenience. As soon as a schedule was set individually on all the parents and teacher, actual administration of the survey was conducted through the use of the self-administered questionnaire.

- Percentage.
- Ranking.
- Weighted Mean.

$$X = \frac{\sum (f) (p)}{N}$$

F test.

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

Furthermore, an interview on respondents was also held from the parents and teachers. The questions focused on the impact of the school environmental factors that cannot be described by the survey questionnaire in order to come up with a more comprehensive descriptive study of the subject.

After all questionnaires and interviews were completed, collation of data started. Analysis of the collected data followed and the researcher started analyzing the impact of school environmental factors to the motor development of students with autism spectrum disorder. Descriptive analysis was done and findings were drawn from the data.

Statistical Analysis of the Data

The data in the questionnaires collected were tallied and frequency distribution was carefully made. Likewise, the data gathered from the interviews were carefully considered in the frequency distribution for veracity and consistency.

Where:

- X = the weighted mean
- f = frequency
- p = allocated points
- n = number of respondents
- ∑ = summation

Where:

- t = difference between means
- x1 = mean of the first group
- x2 = mean of the second group
- s₁² = variance of the first group
- s₂² = variance of the second group
- N₁ = number of sample of the first group
- N₂ = number of the sample of the second group

PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA

The following are the findings of the study based on the survey and interviews conducted.

Specific Problem No. 1

Level of Assessments of the School Administrators and SPED teachers and

Parents/Guardians as to the Impact of the School Environment to the Motor Development of the Students with Autism Spectrum Disorder (ASD).

From the conduct of the surveys and interviews, the researcher arrived at the following findings.

Table 2 - Assessment on the Impact of School Environmental Factors to the Motor Development of Students with ASD in Pinaglabanan Elementary School

Identified Impact	N= 5 ADMINISTRATOR AND SPED TEACHERS			N= 11 PARENTS			N= 16 OVERALL		
	W.M.	V.I.	RANK	W.M.	V.I.	RANK	W.M.	V.I.	RANK
1. School fine motor activities provided by the SpEd teachers.	3.20	AI	5	3.10	AI	1	3.19	AI	1
2. School gross motor activities provided by the SpEd teachers.	3.20	AI	5	3.00	AI	2.5	3.1	AI	2.5
3. Resources provided by the SpEd teachers.	3.20	AI	5	2.73	AI	5.5	2.96	AI	5.5
4. Play time activities provided by the SpEd teachers.	3.20	AI	5	2.91	AI	4	3.05	AI	2.91
5. Play activities with his peers.	3.20	AI	5	2.45	MI	7.5	2.82	AI	2.45
6. School outdoor space such as playground and quadrangle.	3.20	AI	5	3.00	AI	2.5	3.10	AI	3.00
7. School indoor space such as classrooms and gym.	3.20	AI	5	2.73	AI	5.5	2.96	AI	5.5
8. School outdoor equipment (e.g., playground)	3.20	AI	5	1.82	MI	10	2.51	AI	10
9. School indoor equipment (e.g., jumping rope, ball, door gym and etc.)	3.20	AI	5	2.36	MI	9	2.78	AI	9
10. Number of school hours stay of the student	3.20	AI	5	2.45	MI	7.5	2.82	AI	7.5
TOTAL WEIGHTED MEAN	3.20	AI		2.66	AI		2.93	AI	

LEGEND:

OPTION	VERBAL INTERPRETATION	SCALE
4	GREAT IMPACT	3.50 – 4.0
3	AVERAGE IMPACT	2.50 – 3.49
2	MINIMAL IMPACT	1.50 – 2.49
1	NO IMPACT	1.0 – 1.49

Table 2 presents the assessments of the groups of respondents with regard to the impact of the motor development of the special learners.

As defined in Table 2, the assessed levels of impact of the environmental factors to motor development of students with ASD as demonstrated by the School Administrators and Special Education Teachers revealed very strong evidence that there was only average impact of the school environment to the motor development of the special learners.

Among the assessments of the school administrators and and Sped teachers, they evaluated all the environmental factors having an average impact with obtained means of $X=3.20$ each and were ranked 5, respectively. This signifies that the students have improved or have known 2-3 new skills from the start of the school year 2013 regardless, if it is gross or fine motor skill.

As supported by the administrator/teachers answered during the interview,

“Students’ fine motor skills have developed (E.g, tracing lines, shapes, letters, numbers, and writing names).”

One Sped teacher claimed that her students have improved her motor skills such as able to grasp the pencil, color the pictures,

jump, and can now imitate steps when doing the exercises.

On the other hand, the parents obtained varied values of means, from the highest, $X= 3.82$ on the great impact of school fine motor activities provided by the Sped teachers which was ranked 1, with $X= 3.64$ the impact of the school gross motor activities provided by the Sped teachers and school outdoor space which were ranked 2.5, $X= 3.55$, all to the great impact; and the impact of playtime activities provided by the Sped teachers which was ranked 4, $X= 3.36$ the impact of resources provided by the Sped teachers and school indoor space which were ranked 5.5, $X= 3.09$ the impact of play activities with peers and number of school hours stay which were ranked 7.5, $X= 3.00$ the impact of using the school indoor equipment which was ranked 9, and $X= 2.45$ the impact school outdoor equipment which was ranked 10

Having a total mean of 2.66, the parents of the students believed that the environmental factors have an average impact in the motor development of their children. Average impact indicates that the students have improved or has known 2-3 new skills from the start of the school year 2013 regardless if it is gross or fine motor skill.

On the interview conducted, 6 parents claimed that their children’s writing skills have really improved. One respondent emphasized

that his child can now brush his teeth and dress up on his own.

The overall obtained means of $X = 3.2$ by the administrator/Sped teachers and $X = 2.93$ by the parents are manifestations that the Department of Education should closely work together, coordinate, and network to democratize access to public education service, especially the learners with special needs, who need special treatment/intervention for them to also lead a meaningful and fruitful life.

Specific Problem No. 2

Significant Difference between the Assessments of the School Administrator/Special Education Teachers and Parents on the Level of impact of the Environmental Factors to the Motor Development.

To answer the research hypothesis (H_0) raised in the study, the researcher treated the data applying the non-parametric tool, the t-test. Using the Statistical Package for Social Science (SPSS), a computer aided statistical tool, the summary of the results of the application of t-test is reported in Table 3.

Table 3 - Significant Difference in the Assessment of the Impact of School Environmental Factors to the Motor Development of Students with ASD

VARIABLES	X		Computed t	Critical t		Interpretation/ Decision
	Administrat or/ Special Education Teachers	Parents		P (T<=t) one-tail	P (T<=t) two-tail	
Environmental Factors to: Motor Development	3.20	2.66	1.784	0.049872714 vs. 1.782287556	0.099745427 vs. 2.17881283	Null H_0 retained

LEGEND:

NS = Not Significant

$\alpha = .05$ Alpha Level
 $df = 12$

A closer examination of Table 3 on the results of the application of t-test, was found to have a no significant difference in the assessments since the computed $t = 1.784$ from the sum of means of $X = 3.20$ (administrator/Sped teachers) and $X = 2.66$ (parents) is a computed t-value which exceed the critical $t = 1.782287556$ (one-tail) and $t = 2.17881283$ (two-tail) test, hence, retained the null H_0 of no significant difference at .05 alpha level and at $df = 12$.

The result signifies that there is no significant difference in the responses of the administrator/Sped teachers and parents on the impact of environmental factors to the motor development of students with ASD. Thus, hypothesis H_0 is retained, which states that, "There is no significant difference in the responses of the administrator/Sped teachers and parents on the impact of environmental factors in the motor development of students with ASD". This implies that the replies of the respondents on the environmental factors are aligned with a distinct degree of impact, which an average impact is shown in the frequency distribution in Table 3.

Specific Problem No. 3

Instructional Plan of Action is Offered to Further Enhance Motor Development of the Students with ASD. (Kindly email the author to request

for the **Proposed Instructional Manual Plan of Action to Enhance Motor Development of the Special Learner**)

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

This study is both descriptive and qualitative in nature. It explores the impact of the environmental factors to the motor development of special learners, those with autism with spectrum disorder (ASD) in a special learning school.

The following are the summarized findings:

The respondents of the study consisted of one (1) school administrator, four (4) SPED teachers, and eleven (11) parents.

Based on the summary of the impact of environmental factors on the motor development of students with autism assessed by the school administrators and SPED teachers was exhibited with average impact ($X = 2.3$) and likewise, the parents strongly agreed the same level of impact was also on the average, felt ($X = 2.66$), respectively.

On the environmental factors, the administrators and SPED teachers, described and ranked all the environmental factors on the same impact which obtained overall means of ($X =$

3.20) with the rank of 5, while, the parents of the student's with ASD ranked the school fine motor activities provided by the Sped teachers as the highest which has a mean of ($X = 3.18$). Next to school fine motor activities are the school gross motor activities provided by the Sped teachers and school outdoor space with a mean of 3.00. Play time activities provided by the Sped teachers follows with 2.9 mean and is ranked 4. Resources provided by the Sped teachers and School indoor spaces have an equal mean equivalent to $X=2.73$ each and they were ranked 5.5. Play activities with his peers and number of school hour stay of the student also have the same mean, $X=2.45$ and they are ranked as 7.5. Next is the school indoor equipment with $X=2.36$ and it is ranked as 9. School outdoor equipment ranked the lowest which obtained a mean of $X=1.82$.

The impact of the environmental factors was further elaborated and clearly discussed during interviews, to wit: On the school fine motor activities provided by the Sped teachers, average impact was noted; the respondents emphasized that thru the administration or the use of equipment practically and relatively affected the child's motor development.

Conclusions

Based on the research findings, the impact of environmental factors on the motor skills of students with ASD, the following conclusions are drawn:

At most, the environmental factors only have an average impact on the motor development of students with autism spectrum disorder (ASD) according to both administrators, and Sped teachers; and parents. These environmental factors are in school fine and gross motor activities, resources provided by the sped teachers, school indoor and door spaces, school indoor and outdoor equipment, and the time spent by the students in the school. According to the parent's assessment, it revealed that the school indoor and outdoor equipment have only minimal impact to the motor development of their children. On the other hand, the interviews with the teachers and parents revealed that the manipulatives have greatly helped the students in improving their motor development.

There is no significant difference in the responses of the parents and school administrators and SPED teachers on the impact of environmental factors to the motor development of students with autism spectrum disorder which implies of an uncertain development from some elements of the environmental factors.

There were identified environmental factors that affected the motor development of the

subjects of the study, however, it was only on the average level on the development skills. The utilization of the different kinds of equipment for ASD learners greatly helped them enhance their motor

Recommendations

Based on the conclusions drawn in this study, the following are recommended:

Given that, at most, the environmental factors only has an average impact on its students' motor development, the Department of Education (DepEd) and the school administrator should review and check the different school environmental factors and its importance. The evaluation of the school environmental factors should be strengthened. Concrete evaluation of the motor skills of the students should then be done and be properly documented. This can serve as basis for continued improvement of the school environmental factors.

The Department of Education, through the school administrators, should also monitor the school environmental factors of their school throughout the school year. Proper documentation can serve as basis for improvement. In Special Education, the environmental factors should not be taken for granted. This should be included in the school's main priorities for improvement. Further studies can be undertaken by other researchers in the same field of study using other school setting and special groups of learners.

REFERENCES

- Brown, Mark & Bergen, Doris. (2002). Play and Social Interaction of Children with Disabilities at Learning/Activity Centers in an Inclusive Preschool. *Journal of Research in Childhood Education*. Vol. 17: pp. 26-37.
- Chawarska, K., Klin, A., & Volkmar F. R., (2008). *Autism Spectrum Disorders in Infants and Toddlers*. New York: Guilford Publications, Inc.
- Child Care (feb 11, 2013). Play Activities to Encourage Motor Development in Child Care. Extension america's research-based learning network.
- Dizon, Edilberto I. et. al. (2000). *Teaching Filipino Children with Autism Revised Edition*. Philippines: Desk Publisher Inc. Hudson, S., Thompson D., & Mack, M. G., *Matching Children and Play Equipment: A Developmental Approach*. The Professional Resource for Teacher and Parents. Retrieved from <http://www.earlychildhoodnews.com/ea>

- [rlychildh](#)
ood/article_view.aspx?ArticleID=463
- Jordan, R. (2003). Social Play and Autism Spectrum Disorders: A perspective on theory, implications and educational approaches. *Autism*, 7(4). 347-360.
- Kurtz, L. A., (2008). Understanding Motor Skills in Children With Dyspraxia, Adhd, Autism, and Other Learning Disabilities. Pentonville Road London: Jessica Kingsley Publishers.
- Lim-Yuson, C. (1982). *The Social-Cognitive Play of Selected Filipino Children*. Unpublished master's thesis, University of the Philippines Diliman, Quezon City.
- Mastrangelo, S. (2009). Harnessing the Power of Play Opportunities for Children with Autism Spectrum Disorders. *Teaching Exceptional Children*, Vol 42, No.1, pp. 34-44. Retrieved from <http://cec.metapress.com/content/583358u5737321r1/>
- Metin, P. (2003). The Effects of Traditional Playground Equipment Design in Children's Developmental Needs. Unpublished Master's Thesis, The Middle East Technical University. Retrieved from <http://etd.lib.metu.edu.tr/upload/1213727/index.pdf>
- Naber, F. et al., (2008). Play Behavior and Attachment in Toddlers with Autism. *Journal of Autism and Developmental Disorder*, 38. 857-866.
- Quill, K. (2002). *Do-Watch-Say-Listen-Say: Social and Communication Intervention for Children with Autism*. Maryland: Paul H Brookes Publishing Co.
- Ramon Abotiz Foundation. (2012). Playgrounds for all. Ramon Abotiz Foundation Inc. Retrieved from <http://www.rafi.org.ph/news-highlights/playgrounds/>
- Reid G. & Todd T. (2006). Increasing Physical Activity in Individuals with Autism. Focus on Autism and Other Developmental Disabilities. Volumes 21, number 3, pages 167-176.
- Rodriguez, T., (October 28, 2011). 5 Activities to Help your Preschooler's Pre-writing Skills. Retrieved from <http://www.smartparenting.com.ph/kids/preschooler/-5-activities-to-help-your-preschooler-s-pre-writing-skills>
- Sachs, N. & Vicenta, T. (2011). Outdoor Environments for Children with Autism and Special Needs. *Implications*, Vol. 09 issue 01. Retrieved from www.informedesign.org
- Simpson, Richard L. (Winter 2004). Finding Effective Intervention and Personnel Preparation Practices for Students with Autism Spectrum Disorders. *Exceptional Children*. Vol. 70, No. 2: pp. 135-144.
- Weider, S. & Greenspan, S. (2003). Climbing the Symbolic Ladder in the DIR Model through Floortime/Interactive Play. *Autism*, 7(4). 425-435.
- Westby, C. (2008, January-February). Play: The Roots of Language and Literacy. *Word of Mouth*. 19(3). 1-7.
- Wolfberg, P. (2003). *Peer Plan and the Autism Spectrum: The Art of Guiding Children's Socialization and Imagination*. Kansas: Autism Asperger Publishing Co.
- Ziviani, J. Boyle, M. & Rodger, S. (2001, January). An Introduction to Play and the Preschool Child with Autism Spectrum Disorder. *British Journal of Occupational Therapy*, 64(1).17-22.