

USING SENSORIMOTOR ACTIVITIES SET FOR THE DEVELOPMENT OF GROSS MOTOR SKILLS OF CHILDREN WITH VISUAL IMPAIRMENT AT KINDERGARDEN LEVEL

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ABSTRACT: *The objective of this research was to study the use of sensorimotor activities set for the development of gross motor skills of children with visual impairment at the kindergarten level. Participants in this research were six children at kindergarten level at The Northern School for the Blind. They were selected by purposive sampling. The treatments in this study were 12 activities which enhanced their gross motor skills. They received treatments individually for 40 minutes a day thrice a week for 12 weeks. Data was analyzed for descriptive statistic, percentage mean and statistic testing by The Wilcoxon signed rank test. The result of gross motor skills development of all the participants after receiving the treatments with sensorimotor activities set was improved. They improved from a rating of "fair" to "good" with progression at 27.31 %. That result proved the assumption of the research. The Efficiency of the process E1 and E2 (E1/E2) of sensorimotor activities set was 82/85 above the goal setting at 75/75 with meant sensorimotor activities set could effect on gross motor skills in children with (visual) impairment and the Efficiency Index (E.I) rate was 0.72 which meant the participants got improved of gross motor skills development at 72.*

Key words: Gross motor skills, Visual impairment, Sensorimotor

INTRODUCTION

The administration of education has issued the policy of education reformation for the disabled or children with special needs in the second century (between 1979 and 2018) according to the vision to effectively educate the disabled in all of ages equally and thoroughly. (The administration of education, 2012) This fortified and increasing educational opportunity for disabled children is needed according to the present economic growth and technological development. Moreover, the educational reformation has its effect on people with every kind of disabilities in every education level, from pre-school to the highest

The northern school for the Blind is the schools for children with visual impairment and multiple disabilities. The school provides education from pre-school to integrating in high school to help the children take care of themselves according to the national policy of education for the disabled and the special needed.

Children with visual impairment (those who are blind and have low vision) are at risk for poor motor skill performance. They appear to be clumsy, especially in a new situation (Houwen et al, 2008). As the result, when the children do not develop their mobility or gross motor and fine motor skills, they have delayed physical development and learning. As the part of the brain

which control physical development and movement develops first, it is the simplest development in the mobility and is the base of other developments in the body. (Pornpilai, 2007)

Presently, there are theories to develop pre-school children which indicate brain processing via activities using different senses. These are, for example, Piaget's theory which classify sensorimotor stage the first stage of human development, Ayre's sensory integration theory, based on neurosciences and choose activities in sensorimotor development to promote variety of developments in human, specifically learning ability (Pornpilai, 2007, Ayres, 2005). Sensorimotor is the technique to give sensory stimulators to activate children's movements. It aims to help children develop their sensory and special skills. The theory focuses on sensory stimulators for mobility. The stimulators instigate seven systems in children; visual system, auditory system, smell system, gustatory system, tactile system, proprioceptive system and vestibular system. (Ruth A. Huebner, 2001, Ayres, 2005 and DeGangi A, 1994). Helping sensory, posture and mobility, (Ayres, 2005) proprioceptive system and vestibular system are crucial for the gross motor skill. This supports physical development in pre-school children which depends on

skills of those and sensory and mobility such as standing, running and jumping.

As a teacher and therapist who provides sensorimotor activities for kindergarten children between educational year 2015-2016, the researcher is, therefore, interested in gross motor development in pre-school children to help this development amongst students, according to the aims of pre-school education. Throughout the experience in managing both private and group activities to support developmental skills in pre-school students, it is evident (that in activities, such as standing, walking, running, jumping and climbing, which encouraged mobility were performed slowly and needed intense pressure via gestures and speaking orders by the teacher. Moreover, most of the children could not do the activity by themselves and preferred not to move. They did not have confidence to jump, climb as well as slide from a slide and disliked to walk on a balance beam. Their performance in these activities was poor, which was not as spontaneous as the children in the same age. When having a test with gross motor evaluation, the children revealed that they had low score to use the gross motor. Regular gross motor skill practice did not help in this term. Then, to arrange activities to develop gross motor skill among the participants, sensorimotor theory was employed to design an activity innovation which specifically helped develop sensorimotor, controlling two systems of gross motor skills; proprioceptive system and vestibular system.

Objectives

- i. To study the strength of gross motor development in children with visual impairment after attending the sensorimotor activity set
- ii. To study effectiveness of sensorimotor activity set.

Framework

The target group was 6 kindergarten students studying in kindergarten in educational year 2016. The students were chosen by;

- i. Diagnosis indicating visual impairment
- ii. Ages between 5 and 12 years old
- iii. score on gross motor testing showed below "good"
- iv. Parent's permission to attend the project
- v.

Research Tools

1. The sensorimotor activity set

Time The first semester, educational year 2016

Hypothesis

After attending the sensorimotor activity set, the participants showed higher percentage of their gross motor development.

Term Definition

The terms used in this study are;

- i. "The visual impairment children" means children who had visual impairment were studying in kindergarten in educational year 2016
- ii. "Gross motor skills" means the abilities to use body to movement such as balancing, walking running and jumping
- iii. "The sensorimotor activity set" means the activity set for stimulating and enhance gross motor skills with created following Ayre's sensory integration theory and Pijaj's perceptual motor theory

Advantages from the Study

- i. The children develop their gross motor skills.
- ii. There is a sensorimotor activity set for developing gross motor in The visual impairment children

The study of developing gross motor in kindergarten school children with the developmental disabilities is as follow;

Research Tools

The tools in this study are;

- A. The innovation tool is 12 activities in vestibuloproprioceptive activity set, approved by 5 experts in the link between the gross motor and the vestibuloproprioceptive activity with the acceptable rate, IOC was 0.95
 - a. The sensorimotor activities are;
 - i. Activities on balance exercise equipment
 - ii. Rolling I the tank
 - iii. Bouncing the ball
 - iv. Sliding the cart
 - v. Making wide steps
 - vi. Walking over the round pillows
 - vii. Walking on the balance beam
 - viii. Jumping trampoline
 - ix. Jumping one leg
 - x. Jumping on the square foam
 - xi. Walking up and down
 - xii. Running with taking fruit model into the basket
- B. The tools to collect data is pre-test and post-test evaluation, which is the gross motor skill test for visual impairment
 - a. Standing on 2 feet
 - b. Stand on one leg
 - c. Walking straight forward
 - d. Walking on the balance beam
 - e. Walking backward
 - f. Walking up and down the steps

- g. Walking over the obstacles
- h. Running in place
- i. Running straight forward
- j. Jumping up and down
- k. Jumping down from the 10-centimetre-tall stand

- 1. Jumping off 2 feet forward

The total score in 12 items the gross motor skill test for pre-school children with visual impairment is 36, with these following score analysis;

Score	analysis
0-12.00	The children need to improve ability of gross motor skills.
12.01-24.00	The children have fair ability of gross motor skills.
24.01-36.00	The children have good ability of gross motor skills.

Developing and strengthening tools in the study

- The researcher developed tools in the research:
- 1. To develop and strengthen tools to indicate sensation and movement
- The researcher:
- 1.1 Studied a curriculum for kindergarten school
 - 1.2 Studied each student’s profile
 - 1.3 Studied theories relevant to the research
 - 1.4 Designed an activity set for the sensorimotor
 - 1.5 Had the activity set examined by five experts by using Item Objective Congruency index (IOC) with acceptable value over 0.50%
- IOC value was 0.95 which indicated that the sensorimotor activity set was relevant to gross motor skill development. The activity could be applied to develop the gross motor.
- 1.6 Analyzed the efficiency of the process E1 and E2 of the sensorimotor activity set
 - 1.7 Effectiveness Index (EI) value was 0.72 (Acceptable value was over 0.50.)
- 2. Developing tools to collect the data, which was gross – motor – skill evaluation
 - 2.1 Studied the method to create the post test and the pre – test

- 2.2 Analyzed the kindergarten curriculum year 2003 and the curriculum for kindergarten in The Northern school the Blind , the educational year 2001, to evaluate gross motor skills
- 2.3 Created pre – test, post – test and gross – motor – skill test which were relevant to physical development in kindergarten Had the tests proved by five experts
- 2.4 Analyzed quality of the tools by finding congruency between the skill evaluation lists and the methods with Item Objective Congruency index (IOC). The respectable outcome was more than 0.50%.

The outcome was 0.96 which indicated that the gross – motor skill evaluation lists were suitable to the evaluation methods with the highest rate of score in every point. The evaluation was able to be applied to test the gross motor.

Method

In this study, there was only one sample group. The samples had a pre – test and post – test when applying the innovation. (The One Group Comparison Present Posttest Design) The detail of the procedure was;

Table 1: The study plan in gross – motor skill development by using sensorimotor activity set

Group	Pre - test	Teaching Method	Post - test
E	T ₁	X	T ₂
E	is the sample students		
X	is the sensorimotor activity set		
T ₁	is the pre – test result		
T ₂	is the post – test result		

The Research Procedure

- i. Collected the student’s background information
- ii. Prepared the pre – test the students’ gross – motor skills and recorded the result
- iii. Arranged the pre – test on the students’ gross – motor skills and recorded the result

iv. Scheduled the 40 – minute activities for each student to practice on Tuesday, Thursday and Fridays for 12 weeks. The students had 25 times practicing during the first semester (June - August 2016) The researcher played the role of the instructor. The dates of the training sessions were flexible. If students had to attend the school’s activities and could not come to the training class, they could make up the training in other days.

In each session, 12 activities were arranged by applying 3-5 activities, each of which took 5-10 minutes, in every session. The activities were repeated in the whole 12 weeks. Noted the children’s performance of gross – motor skills in the form of open – ended record after the activities in each week

v. Arranged the post – test

vi. Analyzed the derived data. Discussed and brief the result, the changes in the children’s abilities to use gross motor

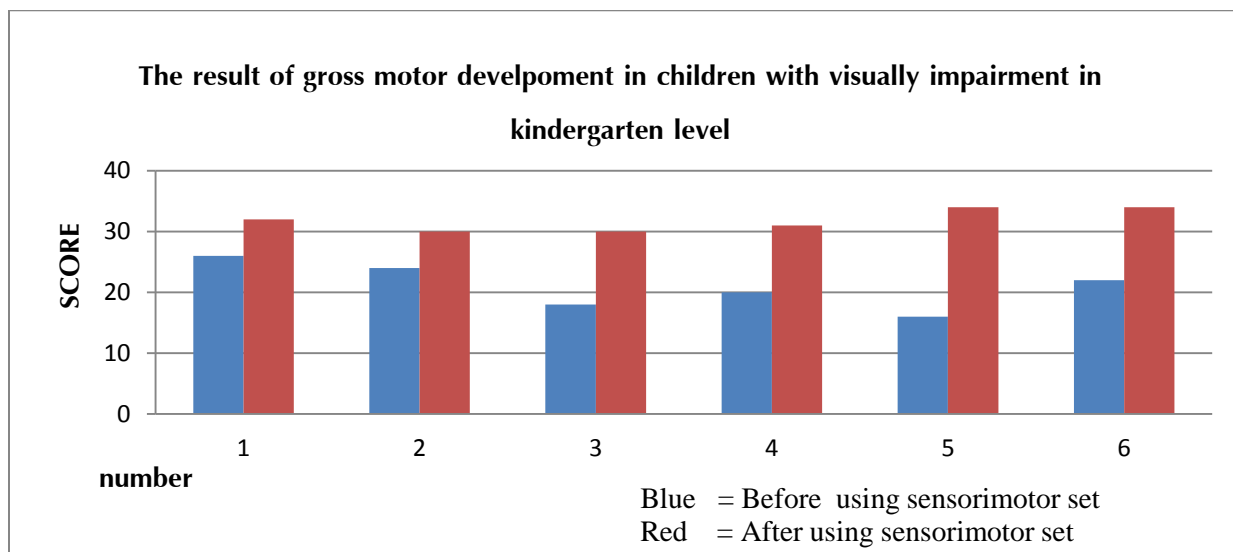
Data Analysis

Using Quantitative data analysis this was done by statistical analysis, such as percentage, mean and statistic testing statistic testing by The Wilcoxon signed rank test.

Result

This research aimed to study gross – motor skill development in children with visual impairment in kindergarten school. It was operated by sensorimotor activity set. The result of the study was presented in two points;

1. The Participants’ Gross – motor Skill Development in children with visually impairment in kindergarten level Academic year 2016



According to graph 1, when comparing the pretest score and the posttest score, it was clear that after using the activity set, every student gained their ability to use the gross motor.

Discussion

1.1 According to the results of the sensorimotor activities to develop gross motor skill in the 6 kindergarten participant with visually impairment, all of the children obtained better gross motor skills. They increased their ability from the level which needs improvement to good level with development value 27.31%, These results were consistent with the research hypothesis.

All of them had a problem with mobility. They were afraid of movement, which delayed their gross motor development due to its lack of exercise. Moreover, in using gross motor in walking, running and jumping, children need two

sensorimotor systems; proprioceptive system and vestibular system, both of which help sensitivity, balance and movement. (Aryes, 2005) In this point, exercising the two systems via the activity set helps develop gross motor skills. This is in accordance with the study by Methaporn Yadonjai (2010) in which sensorimotor activities were applied to strengthen gross motor in six multiple disability children aged 3 – 5 years old. The research indicated that with the activities the children’s gross motor skills could reach a good level. According to Pijajat’s theory, children could get development by exploring the environment. Therefore, participants improved their gross motor abilities because they learning through sensorimotor activities.

1.2 The sensorimotor activity set was developed on the basis of following Ayre’s sensory integration theory and Pijajat’s perceptual motor theories. In this set, sensorimotor activities

were selected because physical development activities such as walking, running and jumping require balance system, proprioceptive system and vestibular system. The Efficiency of the process (E1/E2) of sensorimotor activities set was 82/85 above the goal setting at 75/75 and EI value 0.72. Both of the values were over the adequate rate which proved the efficiency of the sensorimotor activity set in children's gross motor skill development.

RESEARCH CONCLUSION

1. The result of gross motor skills development of all the participants after receiving the treatments with sensorimotor activities set was improved. They improved from a rating of "fair" to "good" with progression at 27.31 %. That result proved the assumption of the research.
2. The Efficiency of the process (E1/E2) of sensorimotor activities set was 82/85 above the goal setting at 75/75 with meant sensorimotor activities set could effect on gross motor skills in children with visually impairment and the Efficiency Index (E.I) rate was 0.72 which meant the participants got improved of gross motor skills development at 72

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