

Measuring Test Visual Motor Skill (TVMS) in Enabling Skills Development of Early Childhood Education: Case Study of TVMS Testing in Early Childhood Education (PAUD) in Cisarua Sukabumi

Hermito Gidion

Vocational Education Program of Universitas Indonesia, UI Campus Depok, Indonesia.

Keywords: Motor Skills, Early Childhood Education, Handwriting

Abstract: The purpose of this study was to determine whether there were differences in excellent motor skills in preschoolers in terms of gender and the place of origin of early childhood schools. The ability of children's fine motor skills develops in pre-school age. This study uses multivariate analysis of variance method, based on Early Childhood Education (ECE) program in Cisarua Sukabumi Jawa Barat Indonesia. Research conducted on 95 Early Children Education (ECE) school environment. There is no difference in the average visual-motor skill test between genders. There are differences in average skill motor visual test based on early childhood education school. There is no interaction between sex with ECE school environment. Handwriting is a means of communicating through the written word. Handwriting is more than learning alphabet. This study expands the existing literature on fine motor precision, fine motor integration, manual dexterity, bilateral coordination, balance, speed & agility, upper-limb coordination and strength, both of which are the development of motor skills on child development.

1 INTRODUCTION

The 4.0 industrial revolution that happening right now demands that the world of early childhood education must be change where education is characterized by digital in the learning process. Every early childhood education instructor longs for their students to be able to keep abreast of the changing times, especially in the industrial revolution, especially in early childhood education. Early childhood education is starting place where early childhood can be learn and train to be a generation thats is able to complete in the era 4.0 (Rozalena & Kristiawan, 2017).

Handwriting problems are one of the most common causes of referral to occupational therapy services for school-age children (Feder et al., 2000). Tait (1998) surveyed 167 American occupational therapists working in schools and found that 98% of referrals were for students presenting with alleged handwriting difficulties. The assessment of a school-age child's handwriting skills by a pediatric occupational therapist includes biomechanical and ergonomic factors (e.g. pencil grasp or seating posture), perceptual-motor and sensory processing

skills (e.g. visual-motor integration, in-hand manipulation, or visual perception skills), environmental factors (e.g. lighting, placement of paper on the desk, table and/or chair height), and handwriting performance (e.g. legibility and speed). As children enter the pre-school age, almost all parents expect to include children in school that they value will provide enhanced cognitive, affective and psychomotor aspects. Cognitive development in school age is characterized by the mastery of several concepts such as shape and size, space or spatial concept, relationship concept, the concept of amount and time (Turner, 1992).

The Visual Motor Skill Test (TVMS) aims to determine the profile of fine motor skills in preschoolers. This test is intended to determine the child's current fine motor profile which includes the ability to control the body, shoulder strength, elbow strength, wrist and finger strength. In this paper the authors focus on the fine motor skills of boys and girls in six early childhood schools in fine motor skill. Understanding writing here includes the ability to concentrate and attention, response to commands, cognitive aspects, eye coordination (visual) and hand gestures (motor), and physical endurance, especially

the strength of the hand (grasping and pinching) during the child's writing activities. Thus the ability to write can represent the ability of children's visual motor integration and at the same time reflects the profile of fine motor development in children.

Sanghavi and Kelkar (2005) stated that visual motor integration is the ability of the eyes and hands to work simultaneously in an efficient and smooth pattern so that it can translate visual perception into the motor function. There are now several test kits for visual-motor integration of children, such as Visual-Motor Integration Test by Beery (in Kaiser 2009) and Bender-Gestalt Test (Brannigan, Decker, & Madsen, 2004). In the application, both of these test kits require the subject to redraw certain visual forms (usually line drawings or shapes) on paper using a pencil. However, unlike the two visual motor integration tools, the motor visual skill test developed by this author combines motor-visual integration with several other motor elements that affect writing skills.

2 LITERATURE RIVIEW

Fine motor skills are the skills to move and coordinate the movements of small muscles in doing activities using eyehand cordination when doing such activities such as writing, cutting, meronce and others. Writing ability is not determined by the skills of flexibility in wrist motion and finger muscle control, but is also related to visual motor perception, concentration, hand eye coordination, memory, tactile, kinesthetic, body position (propioseptif), paper position, and how to hold the instrument write it. In terms of the process, everything must be coordinated so that the writing is better. Disturbances in one or more of the aspects above tend to affect the quality of the writing process (Gardner, 1986).

Test of Visual-Motor Skills-Revised. The TVMS-R (Gardner, 1995) was designed to assess children's ability to translate, with their hands, what they visually perceive and to gain an understanding of the child's strengths and weaknesses in these visual-motor integration abilities. The deficit in the ability of visual motor skills is a neurological weakness found in the right brain. Children have problems in processing and remembering shapes in numbers, letters and geometric shapes. Deficit in fine motor skills includes difficulty eating with a spoon, drawing, cutting, sticking, writing, and copying shapes from the blackboard. Writting difficulties occur because children have problems in learning about models or shapes and letters (Corbin, 1980).

The visual motor skills test is used as a test of the development of motor perceptual abilities that can be used for screening the readiness of children who will enter elementary school (Kusumowardhani, 2002). Fine motor movements are movements that only involve certain parts of the body and are carried out by the muscles of the upper limb, such as skills using the fingers and wrist movements. Visual-motor integration difficulties among school-age children are common. An estimated 5% to 6% of all school- age children display motor skill difficulties that have a significant impact on their ability to participate in daily tasks required of them at school, at home, and in the community (American Psychiatric Association, 1994, 2000).

3 METHODOLOGY

This study uses multivariate analysis of varians method, based on Early Childhood Education (ECE) program in Cisarua Sukabumi Jawa Barat Indonesia. Research conducted on 95 Early Children Education (ECE) school environment. *This paper seeks to determine whether there are differences in early fine motor skills in early children education based on gender and the environment in which the child learns in stimulating and stimulating the abilities of fine motor skills.*

The stages performed by the authors in this study are as follows:

1) Observations on the object of study

Before this research was done, the author has observed some object of study to be tested. From several observed objects, the writer chooses the object of rural community in Cisarua village with consideration that the area is quite able to represent the average condition of the village community in general that exist in the territory of Indonesia but has the characteristics of urban communities that are commonly found in urban areas, especially in the island Java.

2) Conducting samoling technique

Based on the chosen object of study, the authors conducted a sampling test of 95 pre-school age children at 6 PAUD schools in the study area. The author collaborates with the PAUD teaching community and PAUD teachers individually, preceded by a socialization process to equalize the vision and perception in order to obtain a common perspective, needs and study objectives.

- 3) Conduct training TVMS ways of testing against early childhood teachers in six schools early childhood education.
- 4) Data Processing

Before the testing process, the researcher gave technical guidance to the teachers to use TVMS test instruments to the children. Through the supervision of the authors, teachers independently guide and direct the children to do the test equipment according to the guidance given. General scoring criteria : To achieve a score of 2 (straight lines should be straight, Lines of the same length, Each segment of circular shapes should be smooth arcs, Overlap and gaps between lines, Angles should be within 2 degrees of stimulus), To achieve a score of 1 (The shape is generally a good reproduction but fails to meet any of the previous criteria or meet the previous criteria but ; There is additional line, there are overstakes (numerous lines or sketches), Drawing touch or extend beyond the boundaries of the box, To Achieve a score of 0 (the drawing has the gestalt of the stimulus but the drawing in inferior). Then the total scores of the items are totaled to obtain the total result TVMS.

- 5) Testing process

The researcher conducted a validity and reliability test to see if the TVMS instrument or instrument was in line with what was expected. After that the researchers conducted the testing process using the SPSS software. Before the testing process the researchers gave technical guidance to the teachers to use the TVMS test equipment to the children. Through the supervision of the writer, the teachers independently guide and direct the children to work on the test equipment according to the guidelines given.

- 6) Processing data

Based on test results later writers perform data processing, data summary and interpretation of test results.

- 7) Presenting in the form of a report

The test results are then presented in the form of a report to the school and given directly individually to the child's parents.

- 8) Evaluasi dan tindak lanjut Evaluation and Follow-up

The author then conducted a meeting with the school to provide explanations to the teacher about the profile of each child based on assets and limitations of children and provides teaching techniques to improve or improve the

fine motor skills of children in the next learning process.

4 RESULT AND DISCUSSION

The test was conducted on 95 children in six early childhood education schools in the Cisarua Village, Nagrak, Sukabumi. TVMS testing is done with the help of classroom teachers who have been given a test implementation guide. The time required for testing is limited to only 30 minutes. Determination of the duration of time is determined based on the allocation of time to solve questions per minute, where the number of questions to be done is 26 questions and given a tolerance of 4 minutes for the process. The questions given are in the form of drawings with lines or two-dimensional shapes with certain variations.

Each question has a range of scores between 0-2 with a maximum total score of 48. Children are asked to copy or imitate the object image and re-write the object in the column / space provided in the TVMS book. Then based on the results of their work researchers provide a range of scores according to the ability of children with very good categories, quite good and need to be improved. This test has been designed as needed to explore the fine motor abilities of children.

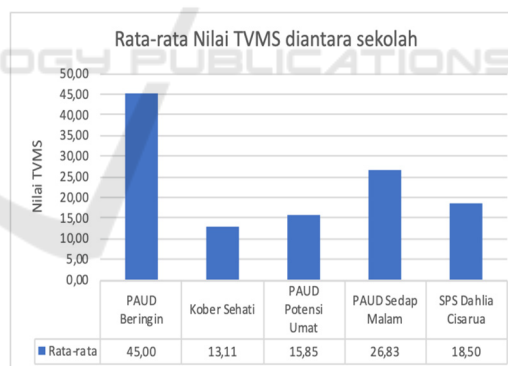


Figure 1: the average of TVMS value between schools.

The graph above shows that the highest average TVMS is Beringin early childhood education, which is 45.00, while the lowest in Dahlia early childhood education Cisarua is 18.50. because statistically significant, then further tested with LSD (Least Square Difference)

From these results the Beringin early childhood education has the highest score because the Beringin early childhood education in the process of giving children gross and fine motor stimulation is very high with sports activities such as playing ball, archery,

drawing and coloring activities. Teachers in early childhood education (ECE) very cooperative in providing gross and fine motor activities at school and there is home work at home to improve fine motor and gross motor skills of young children. Early childhood school facilities in ECE are more complete and better than other early childhood schools, thus affecting the learning process that affects the ability of TVMS.

To support the results of the ability to test visual motor skills in early childhood, training is needed to improve the ability of early childhood in terms of :

- 1) Attention and concentration, namely the ability of children to focus attention on instructions or instructions given by the teacher when explaining the workmanship task guide
- 2) Understanding (cognitive aspect), namely the ability of children in understanding the content of commands given by teachers and able to apply to motor activity
- 3) Eye and hand coordination, i.e., visual ability and hand movements that are mutually supportive when the child starts to perform writing movements
- 4) Fine motor visual skills, i.e. the ability of application of fine motor aspects of the child consistently when doing writing movements
- 5) Coordination of two hands (*bilateral coordination*), namely the ability of both right and left hand coordinated according to its function when the child is doing writing activities. For example, one dominant hand used to write one hand is used to hold the balance of the body.
- 6) Coordination of one hand (*lateral coordination*), namely the ability of one hand dominant to perform writing activities consistently
- 7) The power of grasping (*hand grasp*), i.e., the ability of a handheld dominant hand during writing activity
- 8) The clamping force (*pinch*), which is the ability of two fingers that rest on the strength of the fingertips used to clamp the stationery
- 9) Three jaw chucks, namely the ability to balance and coordinate the three fingers used during writing.

Information on the test results is an important concern for teachers or parents to help children overcome limitations and develop children's assets or abilities so that it increases more. Therefore, based on the results of TVMS testing above then researchers do dissemination to the ECE school and teachers. It is important to inform the school that the results of the tests are not intended to assess the good or bad of the

child's motor skills alone but rather to improve and refine the teaching methods in the classroom to focus more on improving and developing fine motor skills of the child.

5 CONCLUSION

Handwriting is a means of communicating through the written word. Handwriting is more than learning alphabet. It involves an integration of body skill and grahamotor abilities (Fletcher, B. E., 1997). Posture, fine motor skill, sensory integrative, and perceptual abilities are functional skills requires for legible handwriting. Tupper & Miesner, 1992 said handwriting problems can lead to lack of self esteem or aggressive behavior to try to hide on difficulties.

Knowing the child's motor skills profile in child growth is very important to support the learning ability of children. Parents and teachers should be involved in monitoring child development. Testing times became one of the tests that can determine the profile of the ability of the child. Through this test in children, ECE obtained the profile of motor abilities of children. This test is excellent for use by ECE schools so that schools and teachers can evaluate teaching methods referring to the child's motor skills profile. Furthermore, this test needs to be developed by enriching the instruments and other variables to better capture more detailed profiles of children's motor skills. The limitation of this test is still focusing on fine motor skills related to writing ability. Therefore the development of other types of activities that represent the fine motor skills of the child is very open for further development.

ACKNOWLEDGEMENT

In the preparation of this paper, the authors conveyed infinite gratitude to DRPM UI, which has provided an opportunity for writers to research the business of the implementation agenda of community service programs, conducted. Acknowledgments are also devoted to the Vocational Education Program of the University of Indonesia, which has provided an opportunity for writers to be able to attend as well as presenting this paper.

REFERENCES

- American Psychiatric Association. (1994). Motor skill disorder 315.40 Developmental coordination disorder. In American Psychiatric Association, *Diagnostic and statistical manual of mental disorders* (4th ed., pp. 53–55). Washington, DC: Author.
- American Psychiatric Association. (2000). Motor skill disorder 315.40 Developmental coordination disorder. In American Psychiatric Association, *Diagnostic and statistical manual of mental disorders* (4th ed. text rev., pp. 56–58). Washington, DC: Author.
- Corbin, C.B (1980). *A textbook of Motor Development*. Arizona : Wm. C. Brown Company Publisher.
- Direktorat Pembinaan Anak usia Dini. (2015). Petunjuk Teknis Penyelenggaraan PAUD HI di Satuan PAUD. Jakarta: Kemendikbud
- Fletcher, B. E. (1997). *The relationship between visual-motor development and handwriting in kindergarten children* (Order No. 1383862). Available from ProQuest Dissertations & Theses Global. (304404471). Retrieved from <https://remote-lib.ui.ac.id:2076/docview/304404471?accountid=17242>
- Gardner, M.F. (1986). *Test of Visual Motor Skill*. California: Children's Hospital of San Fransisco.
- Gardner, M. F. (1995). *Test of Visual-Motor Skills-Revised*. Hydesville, CA: Psychological & Educational Publications
- Kusumowarhani, R, (2002). Profil Bender Gestalt pada anak ADHD. *Tesis Falkutas Psikologi UI*
- Palmer, Hap, (2001). *The Music, Movement, and Learning Connection*. *Young Children*, 56 (5), 13-17.
- Papalia, D., & Fedlman, R. (2012). *Experience Human Development (12th ed.)*. New York : McGraw-Hill.
- Santrock, J, W. (2011)*Child Development 13th edition*. New York : Mc-Graw Hill.
- Sujiono, Bambang dkk.(2005). *Metode Pengembangan Fisik*. Jakarta: Universitas Terbuka
- Turner, J. S.,& Donald, B. H. (1995). *Lifespan Development (5th ed.)*. USA ; Wardworth