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Conceptual Framework of Development and Testing Remedial Module of Dysgraphia Students through the Visual Spatial-Writing Skill Learning Module (KEM-V) in Writing

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Abstract

Writing skills is very important for the development of childhood education as early as school. Learning strategies and techniques need to be diversified so students can master writing skills. Implementation of learning using space visual application techniques can improve writing skills among dysgraphic students. This study aims to build a viability camp-based module based on a combination of dysgraphia theory and howard gardner intelligence theory to improve writing skills on dysgraphia students. Literature review discusses (1) general research about dysgraphia in Malaysia and other countries, (2) remedial module intervention for dysgraphia in Malaysia and (3) visual spatial studies in Malaysia and other countries. Based on the conceptual framework, the study contains two phases namely construction and testing to test the reliability of the KeM-V's Remedial Module against dysgraphia students. At the end of the study, dysgraphia students are expected to master the writing skills of letters and words well on a line consistently.

Keywords: Visual Spatial, Writing Skill, Dysgraphia, Module.

Introduction

Dysgraphia is a difficulty that involving fine motor skills and hand to write (Kandel & Perret, 2015). Through the Malaysian Education Development Plan (PPPM) 2013-2025,The Ministry of Education Malaysia seeks to ensure that human capital needs special attention as mainstream pupils in the national education system (Kementerian Pendidikan Malaysia, 2012).

The mastery of basic writing skills at the beginning of schooling is necessary for each student. This is important because the weakness of mastering writing skills in the early stages can be the cause of all the learning problems in the whole of the students involved (Dinehart, 2015). Weak fine motor control, weak eye coordination, sharpened pencil grip and incorrect

body posture position when writing are the cause for the students failing to master writing skills (*Kutty, Yasin & Majid, 2012).*

The use of teaching strategies in accordance with the level of intelligence and the students' knowledge is a characteristic of teaching skill competence that a teacher needs (Ahmad & Jinggan, 2015). Teaching and learning methods based on the concept of visual spatial intelligence contain a combination of cognitive-stimulating texts and images found in every individual (Abdullah, Salsidu & Azman, 2017).

Hence, a conceptual framework of development and testing Remedial modules of dysgraphia student through the visual spatial-writing skill learning module in writing is appropriate and suitable to assist in the Remedial of writing skills among dysgraphia students.

Literature Review

The literature review contains discussions about general research about dysgraphia in Malaysia and other countries, remedial module intervention for dysgraphia in Malaysia and visual spatial studies in Malaysia and other countries.

General Research about Dysgraphia In Malaysia and Other Countries

Dysgraphia is a problem of writing disorders pertaining to fine motor skills that causes disturbance in the development of academic skills (Cappa, Giulivi, Schiliro, Bastiani, Muziod & Meloni, 2015). Dysgraphia is also termed as a written language disorder that relates to mechanical writing skills (Chang &Yu, 2013).

Dysgraphia is a difficulty in expressive writing or repeated errors in spelling and grammar (Mogasale & Patil, 2012). Dysgraphia is also described as a disturbance or difficulty in producing written language related to writing mechanics and fails to acquire the mastery of fine motor skills in handwriting (Danna, Paz-Villagrana & Velay, 2013). Dysgraphia is a condition when a child experiences inability to coordinate the painting and handwriting motor (American Psychiatric Association, 2013).

Dysgraphia students are divided into three categories namely dyslexic dysgraphia, motor dysgraphia and spatial dysgraphia. Dyslexic dysgraphia is a result of spontaneous writing that is difficult to read but the writing can be understood after using the method of copying or copying the words. Motor dysgraphia is a problem building fine motor skills while spatial dysgraphia is a kid with normal spelling and reading abilities but their handwriting is still hard to read either writing spontaneously or reproducing (Mahlie & Jiniti, 2010).

In addition to having a writing skill level lower than the chronological age, dysgraphia students are also classified into two categories, namely (1) perception which means children can not make connections between symbolic and spelling systems that represent sounds, words, and phrases and (2) motor (disortography) means children can talk and read but experience difficulties with fine motor skills (Martins, Bastos, Cecato, Araujo, Magro & Alaminos, 2013).

The difference between student dysgraphia and normal pupils is clearly seen through writing exercises. The quality and ease of student writing dysgraphia is lower than normal student writing or typing tools (Vandenborre, Dun, Engelborghs & Marien, 2015). This

problem is a decline in the processing of written language characterized by an unbalanced writing difficulty in the spelling or words spelling (Costello & Balasubramanian, 2012).

Children with dysgraphia are picture thinkers. They remember a letter through the picture in their mind to match the letter. Every time someone writes letters on a blackboard, they record them in their image memory. The confusion increases when dysgraphia students do not know which picture option to use because they have recorded multiple mental images for the same letter. Dysgraphia pupils are very slow and unsure when carrying out writing activities. They write unorganized and inscripts are inconsistent due to the mental worries that apply. Therefore, teacher guidance through strategies and therapies is necessary to assist dysgraphic students (Zazio, Capasso & Miceli, 2013).

Dysgraphia or a regular expression of speech impairments is passed by most children but can not be underestimated by families and the school. Neuromotor mechanism disorders should be addressed through the immediate diagnostic method and the efficacy of a physician to treat dysgraphic disorders. Special attention should be given to the potential or diversity that contributes to dysgraphia problems. Health experts and educators should work together to ensure that disgraphia is handled appropriately (Chung & Patel, 2015).

In the context of this study, previous researchers have examined clearly about dysgraphic students. Explanation of terms, concepts, features, needs, constraints, situations and difficulties faced by dysgraphia sufferers is described in detail. This study concluded that the students of dysgraphia are students who are experiencing problems and lack of writing activities due to various factors such as natural retardation, poor motor skills, lack of training, unnoticed learning techniques and the lack of awareness of some of the importance of helping students with dysgraphia to improve their writing skills. Thus, this study was conducted so that the researcher could construct a method of writing skills learning solution using a new technique via visual spatial elements.

Remedial Module Intervention for Dysgraphia In Malaysia

Dysgraphia is a specific learning problem that involves writing skills disorders and limiting the development of children's learning. There are severals studies on childen with dysgraphia have been conducted.

The collection of fine motor interventions through the coloring and writing sketch module highlights the correct writing guidelines according to the appropriate position, the type of pencil grip and the appropriate exercises for writing skills on the development of children with special needs (Zainol, 2015). Spatial issues, letters uniformity, letter shapes, pencil grip techniques, spelling problems and incomplete problem writing problems can be solved through the use of pencil as a kit kit, the use of parchment or striped papers, following the correct procedures in writing upper and lower case letters, holding the pencil correctly and comfortably, reading write and focus, encouragement and over time to the pupils for writing can help dysgraphia students improve their mastery in their writing skills (Mahlie & Jiniti, 2010).

The way to help dysgraphia students is the use of loud and clear voice when speaking, recording student voices, using typing techniques with computer keyboards, writing using large-size pencils, using colorful pencils to draw attention and focus, writing on striped papers

and continuous and consistent training (Wismail, 2012). The learning techniques while playing provide a cheerful, emotional and emotional learning environment and increase intelligence towards dysgraphic students while doing classroom exercises. This technique is a structured and structured learning approach (Chew, 2015).

Literature Review About Visual Spatial Studies In Malaysia and Other Countries

Intelligence is cleverness (Dewan Bahasa & Pustaka, 2018). Intelligence is the ability to think and take action either correct or inaccurate in the context of application that sees human ability to think according to good formal rules and the ability to think logically (Smet, Paquier, Verhoever & Marien, 2013). Visual spatial intelligence explains the concept of space and the individual's ability to visualize information with a mind lens (Bucher, Bublak, Kerkho, Geyer & Muller, 2018). Spatial visual intelligence can be detailed to two situations. Visual elements describe the development of knowledge can be obtained through visualization methods. The activities of painting, colouring, copying and copying objects are concepts brought by visual elements in the individual needs of an individual's knowledge. The mentioned activity involves the integration of fine motor skills that serves as an important supporter of product creation from the activities carried out (Samah, 2016).

The intelligence features expressed in the Howard Gardner Multiple Intelligence Theory is intelligible to learn, intelligence does not grow in tandem, intelligence can not be evaluated separately, one or two intelligences can be fully developed, intelligence can be planned as well as intelligence can be transferred (Kuntze, Molen & Born, 2018). Visual spatial intelligence also describes the concept of space and the individual's ability to visualize information with the mind lenses (Bucher, Bublak, Kerkho, Geyer & Muller, 2018).

Visual spatial intelligence can be detailed to two situations. Visual elements describe the development of knowledge can be obtained through visualization methods. The activities of painting, coloring, copying and copying objects are concepts brought by visual elements in the individual needs of an individual's knowledge. The mentioned activity involves the integration of fine motor skills that serves as an important supporter of product creation from the activities carried out. Spatial ability is one of three factors in the hierarchy of intelligence model. Individuals are able to tell and describe the experiences they have experienced and wisely connect between objects in space. Visual space intelligence enables individuals to visualize visual ideas and space tends to be imaginative and creative (Maktar, 2011).

The combination of a variety of interactive teaching and learning tools help specialists improve their literacy development (Ahmad, 2015). Students with special needs learning problems require specific, creative, diverse and appropriate teaching and learning methods to complement their own educational needs (Slota, McLaughlin, Bradford, Langley & Vittone, 2017). Visual Arts education is taught in schools aiming at giving students the opportunity to cultivate interest, develop personality, awareness and sensitivity to artistic and environmental values including sharpening of motor skills (Ismail, 2015). Art activities require an exercise in coordination between eye stimuli, thinking skills, practical theoretical skills and practices (Sapsed & Tschang, 2014).

Handwriting exercises include story writing guided by a comic book, spontaneous writing or other tasks such as paper and pencil exercises, fine motor training and visual-

motorized tasks (Vaivret-Douret et al, 2011). Previous studies show an important relationship exists between the integration of visual motor with motor skills towards children to increase the level of writing capability (Shen, Lee & Chen, 2012). Drawing methods are often used in children to enhance understanding. The use of creative and visual teaching and learning methods generally facilitates teachers to evaluate the level of understanding that children are thinking of (Sultan, Masnan, Rohaizad & Salleh, 2016).

Drawing is a fun activity and involves dimensions of either visuals or senses that can not be described using the language of the word. Studies show that children as young as 22-26 months can understand the concept of space such as the relationship between the object and the hole that puts various forms of the object into the shape of the hole correctly (Calan, 2015). Drawing can develop children's cognitive skills through the concept of the form viewed daily. Drawing round, rectangular and triangular forms related to the environment such as schools, homes and places often around children gives them the opportunity to approach reality or hands-on (Wood & Hall, 2011). The approach used to improve writing skills in previous studies is the motor perception method, visual motor method, fine motor control method, intervention method or individual training and additional writing skill instruction (Chia, Saliyan, Tan, Mohammad & Aziz, 2013).

The use of strategies and teaching methods that suit the level of intelligence and the students' knowledge is a feature of the teaching skills competence that a teacher needs (Ahmad & Jinggan, 2015). Individuals who have this space visualizing skill have high imagination capability and are able to create something creative or new and it is difficult to think of others (Rahman, Jamali, Azizan & Isa, 2016). The visualization process is one of the elements in space visualization skills that involves existing images and converted into visual forms to be manipulated, refined and transferred to other forms (Barrientos, 2016).

Children with impaired writing show positive responses when their learning is integrated with visual spatial facilities (Benedan, Powell, Zajac, Lum & Snow, 2018). The reproducibility of the word in the visual element of the space is found to help the student develop in literacy skills (Chang & Yu, 2013). A lower level of ability to visualize an image can affect the academic development of a child. Previous studies have suggested that space visual skills should be applied in the teaching and learning process as one of the components of writing skills (Sun, Desroches, Liu, & Peng, 2011). Brain imaging studies have found that the mastery of writing skills should involve various brain neural interactions including visual components and motor integration (Carlson, Rowe & Curby, 2013). In addition, a study found that age, gender and visual-motor integration are an important aspect in producing quality writing skills while the age, reading ability and smooth motor coordination help someone write faster (Hellinckx, Roeyers & Waelvelde, 2013).

The ability to master the visual elements of the space is important to ensure each letter, including the length of a stroke of letters, sequence, line order and amount of alignment and curvature of letters and words can be written in a regular and uniform manner in the space and lines provided (Rosenblum, 2015). Some initiatives can be done to help students write dysgraphia skills including various applications such as moving speeches to texts, voice recording notes, simultaneous recording, visual and typing visuals, note notes and

even therapeutic hand exercises to improve the subtle motor skills of the child (Bjekic, Obradovi, Vucetic & Bojovi, 2014).

Conceptual Framework

Based on the literature review, the conceptual framework of this study consists of several concepts and theories that have relationships with one another. This conceptual framework will give an overview of the impact of the KeM-V's Remedial Module to improve the level of writing skills of students dysgraphia.

A summary of the concepts and methods to address the problem of writing skills words and letters neatly and well among the problematic students of dysgraphia. Explanation of conceptual or conceptual considerations is important to ensure readers understand the sequence of problems solved. Explanation of this concept is also important as a guide and ensures the problem solving is conducted on a regular basis. The components discussed in this conceptual framework are Dysgraphia Theory, Multiple Intelligence Theory and the KeM-V's Remedial module to improve the writing skills of dysgraphic students.

The study to test the reliability of the remedial module contains two identifiable variables ie dependent variables and independent variables. The independent variable refers to the KeM-V's Remedial Module to be developed while the achievement of dysgraphia students in writing skills is the factor of dependent variables. The learning method using the combination of Dysgraphia Theory with Multiple Intelligence Theory will help pupils dysgraphia improve their writing skills in writing letters and words better. Students are divided into two groups namely the control group who will learn the conventional writing method while the treatment group will learn the writing method using the KeM-V's Remedial Module. The results of the study will be seen after the researcher successfully completes all the processes in the conceptual framework.

The Dysgraphia theory by Santrock (1999) is a major reference in the study of improving writing skills on dysgraphic students. This theory was integrated with the Multiple Intelligence Theory by Gardner (1983) as a better method of helping to master the writing skills of letters and words based on the use of systematic, colorful and attractive graphs and diagrams. Studying writing skills is a complex process for a child. Writing skills that are not mastered are a source of problems in the future of greater academic development. Children with dysgraphia experience cognitive disorders such as difficulty speaking, reading, writing and having an aggressive behaviors (Santrock, 2016).

Person with dysgraphia can be identified through specific specific features ie (1) writing letters with inconsistent forms, (2) mixed use of lowercase and uppercase letters, (3) inconspicuous and uneven writing size, (4) difficult communication (5) having difficulty holding the pencil or stationery correctly, (6) often speaking alone while holding the pencil and watching the hand holding the pencil because of the deadlock, (7) can not write parallel on the line that has been provided on paper and (8) it is difficult to copy or reproduce the texts provided (Santrock, 2016). Children dysgraphia difficult to differentiate the use of uppercase letters and write on flip-patterned writing lines (Danna, Paz-Villagran & Velay, 2013).

Training children to continue writing is significant so that writing skills can be improved. Providing child-friendly and interesting training such as writing to parents, making notes using color pencils and writing on illustrated worksheets help them apply abstract concepts of letters and words in concrete form (Ann, 2012). Visualization capability refers to drawing activities and writing or reproducing assignments to the desired situation (Nor, 2015). Visual spatial intelligence enables dysgraphic students who possess this intelligence to master knowledge through the help of a mental picture of a topic learned (Vandenborre, Dun, Engelborghs & Marien, 2015).

Multiple Intelligence Theory can help the teacher to carry out teaching and learning more effectively because it fulfills the needs of student learning. Multiple Intelligence Theory can help the teacher to carry out teaching and learning more effectively because it fulfills the needs of student learning (Tse, Thanapalan & Chan, 2014).

Visual spatial element help motivate dysgraphic students to improve their writing skills. Learning methods such as drawing in the space provided consistently and carrying out graphic and color activities can attract students to master learning (Nor, 2015). Colouring skills are an important development in line with writing skills. Getting to know the boundaries and space should be taught to children at the beginning of their learning so that children can learn to control hand movements within the boundaries of sketches (Zainol, 2015).

In the context of this study, the researcher combines the Dysgraphia Theory with the visual spatial intelligence focuses on the use of colored graphics and images in a systematic form of training to help dysgraphia learners improve their writing skills and their words better.

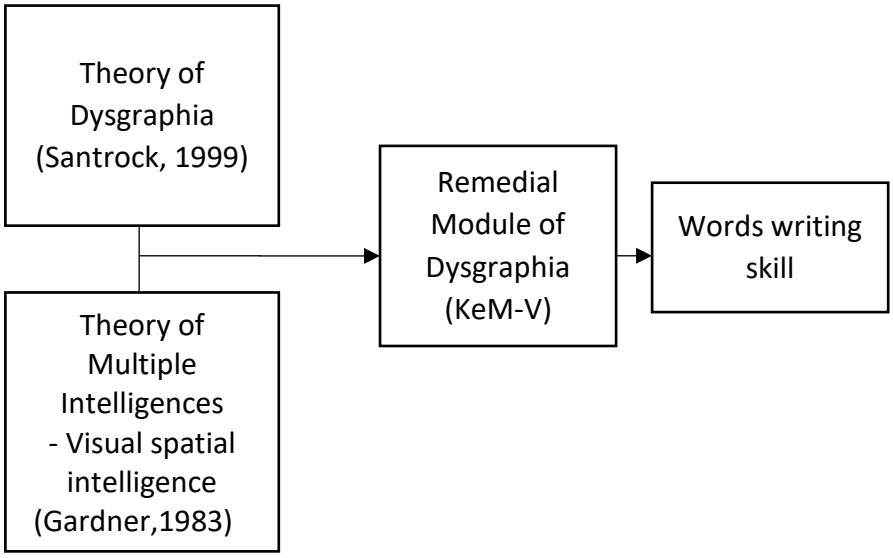

Figure 1 Conceptual Framework

Conclusion and Discussion

As a conclusion, literature review highlights discussed the underlying theory of this study. The use of visual elements-colored space and writing activities in the printed space and bears in the process of teaching and learning the writing skills of letters and words on a single line

helps dysgraphia students write neatly and consistently. The combination of visual-space elements in learning helps students dysgraphia improve their achievement in writing skills.

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