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MEDIA-NEED ASSESSMENT FOR CHILDREN WITH LEARNING DISABILITIES: A CASE STUDY ON SCAFFOLDING CHILDREN WITH DYSGRAPHIA IN INCLUSIVE SCHOOLS

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Abstract: *This research aims at (1) identifying the characteristics of handwriting difficulties in inclusive schools, (2) assessing the types of the intervention of handwriting difficulties, (3) adjusting media utility to the types of handwriting difficulties.This research is an explorative case study involving teachers, therapists, and children with handwriting problems assigned through a snowball sampling technique. Data was collected from the interview, observation, and children work in writing. While observation is conducted to explore the children' process of writing, the interview is used to get the information from the teachers on the children' difficulties found in the children work of writing. The data were analyzed by qualitative descriptive on the types of writing problems and the use of utilities for scaffolding. The research concludes that (1) there is a big number of children with dysgraphia, (2) children with dysgraphia need scaffolding through different ways of intervention, (3) the utility of handwriting medium needs adjustment on the individual basis of scaffolding.*

Keywords: *Learning disability, dysgraphia, assessment, intervention, handwriting.*

Introduction

Background.

The concept of inclusive education is enabling children with disabilities to develop to their own fullest potential. This concept was aligned with the Ministry of Education Rule No. 70 – 2009,

on Inclusive Education stating that children with disabilities learn in regular schools. Nonetheless, along with the progressive development, many newly established inclusive schools are particularly limited to human resources in term of instructional strategy for children with learning disabilities (Gunarhadi, 2016).In many cases, regular teachers are not accustomed to teaching children with disabilities. In particular, those with handwriting problems (dysgraphia) do not get as much benefit from educational services as expected. Consequently, these children lag behind those of non-handicapped because they could not learn from other peers under the aligned curriculum (Hallahan& Cohen, 2005).Common problems of learning disabilities caused by a minimal brain injury that results in reduced fine-motor skill and visual processing deficits (Hallahan&Cohen, 2005; Lerner& John,2015; Abdul Rahman, 2012). Such deficits, furthermore affect academic problems in the school settings, especially when they start the elementary levels.

In practice, teachers may find some children with a wide range of handwriting difficulties (dysgraphia). Teachers may find some children to be at the level of scribbling stage of development (Harwell, 2001). Handwriting is practically an essential competency in everyday life instead of the presence of the computer words processing. It represents the particular communication skill. In schools, handwriting is the usual medium through which the children convey to the teachers what they have learned. In any situations, adults also find writing a necessity that they can not avoid (Harwell, 2001, Lerner, 2015). For some children, however, handwriting problems remain untreated correctly in schools. As indicated, such children are found to hold pencils awkwardly as it is learned wrongly from the previous way of writing experience. Once it established, it is tough to correct since the new way feels odd to them. Such a problem causes their hands to be tired efficiently when the writing work increases in their higher grades. Children with dysgraphia frequently make different ways of writing such as forming letters poorly, reverse letters, skip lines and other typical bizarre manners of handwriting Harwell (2001). To these problems, special education needed for how to design the instruction.

The benefits of Research.

This research is intended to provide teachers with knowledge and skill on the characteristics of handwriting difficulties, the kind of scaffolding given to children with handwriting difficulties, and the media needed to help children with dysgraphia.

Method

The research is an explorative case-study on dysgraphia. The study took the place of in elementary schools by involving researchers, teachers, and children in two inclusive schools in Surakarta, Central Java. The data on handwriting works of children with dysgraphia was collected through snowball sampling technique. Using handwriting task, 19 children in grade three and four of these schools were asked to handwrite during the lesson of Bahasa Indonesia. The validity of the data was reached through crosschecking with daily assignment utilizing handwriting works. In addition to crosschecking, the validity was obtained through an interview with teachers and observation on the children' accomplishment of handwriting process. The data was analyzed for the judgment of appropriate scaffolding that might be needed accordingly. The need of media, which is the primary concern of this research, is explored for possible utility during the time of scaffolding.

Results and discussion

Characteristics of Dysgraphia

The research found the characteristics of handwriting difficulties in many types of problems. From the handwriting works of 19 (14,3.%) Boys and girls out of 132 children in grades III and IV of two elementary schools were identified as having dysgraphia. The result of the assessment shows there were at least seven types of handwriting problems found in this research. Each type of problems can be described in the following table.

Table 1: Types of Identified Handwriting Difficulties.

Kinds of handwriting problems	Number of respondents	Percentage
Inacurate copy	3	15,8%
Poor forms of letters	5	26,3%
Skip lines, no space	3	15,8%
Laborious writing	3	15,8%
Unreadability of writing	2	10,5%
Miscellany	3	15,8%
Total	19	100%

Based on Table 1 above, three(15,8%) out of 19 respondents have the problems of inaccurate copy of handwriting, five respondents (26,3%) write in poor forms of letters, three respondents (15,8%) write with no space between letters, six respondents (31,6%) write laboriously, two respondents (10,5%) have unreadable results of handwriting, and three respondents (15,8%) have miscellaneous problems in handwriting. It is important to be noted here that this number of 19 respondents was comprised from 13 boys (68%) and six girls (32%) regarding the degree of intellectual ability and handicapping conditions of the respondents.

From the above figure, the result of the assessment reveals two essential characteristics for discussion. The first is the type of writing problems, and the second is concerning with personal handwriting difficulties. Weak forms of letters are found to be the most problems among these children. Meanwhilst, the rest have relatively similar problems such as skipping lines or no space between letters, and difficult writing or slow in accomplishing the writing task. On the other hand, particularly children with special needs fall into miscellaneous dysgraphia which is characterized by combined problems that the result of their handwriting is confusing to read or is even unreadable. Such problems are presumably derived from neurological causes (Fuchs & Young, 2006; Gargiulo, 2012; Abdul Rahman, 2012).This finding proved the existence of neurological causes of learning disabilities. It is true to the agreement among researchers (NASP, 2010) stating that the nature of specific learning disabilities coexists with other handicapping conditions such as sensory deficits and language impairment.

This research proved that the number of 19 assigned respondents with dysgraphia was comprised of 14 boys (76%) and five girls (34%). It means that handwriting problems turn to

occur in boys and then girls even with high academic achievement (Gersten, Jordan, and Flojo, 2005). Furthermore, this research revealed that children with special needs fall into different handwriting problems. Some three (15,8%) out of 19 children fell into the category of severe handwriting difficulties. About handwriting difficulties, this research is attempting to explore the individual needs of interventional scaffolding.

The Need for Scaffolding for Dysgraphia.

The research team assessed the need for scaffolding strategy based on the types of handwriting difficulties. The following is the kinds of the practice of intervention might be needed among the children with handwriting difficulties.

Table 2: Practices suggested for interventional scaffolding.

Kinds of Scaffolding Needed	Objectives
Massages	Muscles flexion and relaxation
Body Positioning	Correcting setting position
Paper Positioning	Correcting paper position
Holding the pencil	Correcting pencil holding-position
Chalkboard activities	Forming appropriate letter perception
Tracing	Practicing right forms of letters
Dot-dot	Practicing letter form perception
Drawing between the lines	Practicing the right size of letters
Lined paper	Practicing the right size of letters
Fine motor activities	Practicing flexible writing movement

From the above table, it is seen there are some general ways of training children with handwriting difficulties. For the specific ways of practice, these kinds of practice can divide into three sequent steps of practices. They are pre-requisite handwriting practice, prior handwriting activities, real practice activities. Some children have writing problems because they experience stiffness or rigidity that it is difficult for them to hold the pencil and move their hand in writing. Writing requires excellent motor skill. Children with cerebral palsy or with down syndrome, for instance, may lack excellent hand and finger movement. So, it is common for such children to have a hand massage as a pre-requite skill before writing. Since the research took place in inclusive schools, few children of slow learners, and with autism were found to have such problems of handwriting. However, no action of massage was done to them due to the condition that it is not common for the teacher to give massage during class time.

In other cases, some children lack preparation to start writing with messy papers and the like. Inappropriate sitting position may cause poor handwriting habit.Teachers likely have to cautious to the need for facilities and other media to improve their writing skills.

The Needs of Media for Scaffolding the Children with Dysgraphia

To make the intervention effective, facilities and media are need

Table 3: The Needs of Media for Scaffolding Children with Writing Difficulties

Types of Writing Difficulties	Facilities /Media /Utility Needed
Poor forms of letters	Lined papers
Skip lines	Template lines
Inaccurate copying.	Lined papers/ Template lines
Laborious Writing	Correcting pencil holding-position
Holding the pencil	Adjustable pencil grips
Messy papers	Adjustable seat
Unreadable writing	Typewriter/Microcomputer
Muscle stiffness	Massages
Rigid hand muscles	Massages/Practice Sqeezing
Poor fine motor skills	Massages/Rubber ball utility

Shown in the above table are the different types of handwriting problems that may be caused by different deficits either bodily or neurologically. Hence, they need specific facilities or specific medium accordingly. Children with difficulties inaccuracy of copying due to poor motor skills may well be treated through massage before the intervention. In some cases, for autistic children with such difficulties may be provided with a pencil with the adjusted design of grips to eliminate the uncontrollable movement during the intervention. In other cases with hand or finger deformity, however, the utility of adaptive technology (aids low technology) such as Qalamiycan help the students to improve the handwriting ability (Lim Chen Yin, Mohd Hanafi &Mohd Mokhtar, 2012). The qalamiy design is an adaptive tool that combines elements of ergonomic and massage therapy to help children with special needs to hold stationery towards dynamic tripod grip types. This tool lead-position thumb and forefinger by two finger-shaped casing which is two basins suitable to accommodate the three finger grip together on adaptive dynamic tripod grip is similar. The Qalamiy is a fun, affordable and efficient way to teach young children how to hold their pencil correctly. Qalamiy trains hand to hold the pencil correctly and help to enhance and strengthen the hand muscle especially palm muscle. Besides, Qalamiy functions as a pencil with different grip as to solve writing difficulty due to the weak fine motor.

Pencil grip is one of the ergonomic biomechanical factors (Rosenblum et al. 2006). A biomechanical approach is an incremental approach in the selection of intervention approaches (Nelson, Copley, Flanigan & Underwood, 2009). However, a good understanding of the overall ergonomic design allows more effective intervention program (Kavak & Mumin 2009) as fostering a stable grip (Nelson, Copley, Flanigan & Underwood, 2009). The use of technology as an aid intervention strategies that do not work because the grip can be developed with the use of adaptive equipment such as a pencil holder or a specific rubber triangle (McMurry, Drysdale & Jordan, 2009). Using such as plastic grips writing will develop and mature tripod grip when writing (Watkins & Noble, 2011). It is important to be noted that Qalamiy may not fit all kinds of writing problems. It implies that the utility of media is adjusted to the student's need on an individual basis.

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Conclusion

This research comes to the following conclusions

5.1. Dysgraphia is a common problem in elementary schools.The characteristics of handwriting difficulties vary among the children. Additionally, boys tend to be more risky to handwriting difficulties. Scaffolding is needed and is strongly recommended to give through intervention.

5.2. Intervention needs to be given based on the accurate assessment. Different type of handwriting difficulty needs different ways of intervention. It means adequate scaffolding needs to consider the individual characteristics of writing problems.

5.3. The use of media is inevitably needed in scaffolding. Depending on the types and causes of the children' handwriting problems, facilities and media should be designed and utilized for scaffolding on the individual basis.

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