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THE EFFECT OF “SILINDIRLOG” MATERIAL ON TOTALLY BLIND STUDENTS’ CREATING A CRYPTO SKILL

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ABSTRACT

The aim of this research is to investigate the effect of “silindirlog” material on totally blind students’ creating a crypto skill. This study was held on 2 students form Malatya province. During the experimental procedure “silindirlog” material was applied. Before the operation of the material, educator was educated about using the material efficiently. Data was collected through participant observation

According to data, in terms of creating a cyrpto, silindirlog material is effective for totally blind students. In the light of the finding, silindirlog material can be used for totally blind students creating cyrpto skill.

Keywords: Mathematics, Silindirlog Material, Creating Cyrpto Skill.

1. INTRODUCTION

World Health Organisation (WHO) describes “low vision” as optical sharpness of below 6/18 however identical to or superior than 3/60, or a conforming optical field loss to below 20°, in the enhanced eye by means of the best conceivable modification. WHO also describes ‘Blindness’ as optical sharpness of not more than 3/60, or an equivalent optical field loss to fewer than 10°, in the superior sense thru the top potential improvement. ‘Visual impairment’ contains together short image and loss of sight (2018). Visual acuity and visual function should be evaluated for the diagnosis of visual impairment. Visual acuity is generally measured using Snellen Card. The Snellen card consists of 8 rows of E's. There are more than one letter E in each row. The arms of each look in different directions. The person whose

visual acuity is measured is asked to tell the direction in which the arms of the arms are looking. The board or light board is tested by being placed 20 feet (6.04 m) away. Eight ordinary means 4, 5, 6, 9, 12, 15, 21 and 30, 60 meters.

The reality of comprehensive schooling is another way to equate the privileges of children in instruction. Just like to arrange for the facility of capability of special children in the future once the drop in the society. One of the special children group is kids with visual impairment. They are the children that have entire loss of sight and low image. They employ the sagacity of hearing and touch to gather data. In the meantime, kids using low vision groupings are again capable to utilize the sagacity of vision to acquire data, nevertheless they need to utilize optical assistances. 80% of information is obtained In the learning process through sight (Hill and Blasch, 1980). On behalf of the visually impaired pupils data gathering issue is a kind of scramble as they both understanding the globe contrarily according to regular people (Toenders, De Putter, Sanders, Brok, 2017).

Visually impaired students, the entire eyeless classification can not utilize the sagacity of vision as an agency for gaining data. However, majority mathematical means are existing in pictorial notions like statistics, geometry, arithmetic (Queck and McNeill, 2006; Şahin and Yorek, 2009). Consequently, entire sightless classification has trouble in learning mathematics. Conversely, visually impaired students think of the educated guess of volume, surface area and, length better in solid notions when matched to sighted students (Andreou and Kotsis, 2005).

Totally blind individuals are not pitiful, needy, or mentally retarded. They are people who have been taken to the second plan because of blindness, have been isolated by the people, they have not been socialized, they have been deprived of the material and spiritual opportunities, they have not been shown enough interest and they have been seen as a bleeding wound of the society throughout the ages. When we look at the world of mathematics, there are many visually impaired or blind mathematicians such as Leonhard Euler (1707 - 1783), Nicholas Saunderson (1682 - 1739), Louis Antoine (1888 - 1971), Semenovich Pontryagin (1908 - 1988) (Jackson, 2002). The question “how a visually impaired or blind person can learn mathematics”, directs the person asking the question to abacus, braille, tactile graphics, concrete materials (Bravand and Johnson, 2016). But these teaching materials are not enough to provide instructional diversity for visually impaired and blind people.

In addition to this gap in the literature; visually impaired people can not reach sufficient training in Turkey. In Turkey, there is no systematic training activities for pre-school for visually impaired children. They can only benefit from systematic educational activities when they come to school age. There are three types of educational environment where children with visual impairment continue. These; The boarding schools for the visually impaired are special classes and co-educational environments.

Boarding School for the Visually Impaired: There are 15 boarding schools for the disabled in our country. These schools are blinded by ophthalmologists. In schools, the “Primary Education Program Program prepared by the Ministry of National Education is followed. The aims and content of Life Science, Mathematics and Turkish courses in the program are parallel to the normal school program. Unlike the normal school program, physical education and independent movement, modeling business courses are included. In the schools of visually impaired students, touch and hearing-weighted training is carried out, regardless of the students' preferred sensory channels.

Special Class Arrangement: There are two types of special class arrangements for visually impaired children in our country. First; It is a special classroom arrangement in which the visually impaired children continue. In our country, there are three special classes in Antalya, Kayseri and Mardin where children with visual impairment continue. The second of the special class arrangements; Ankara Mitat Eng School for the Visually Impaired Primary School. In the 1997-1998 academic year, students were

admitted to these classes. In the classroom, students are taught reading-writing with printed material or Braille alphabet depending on their preferred sensory channels. Electronic devices (closed circuit television systems) and non-optical tools are used to enable students to use their vision more efficiently.

Collaborative Educational Environments: It is known that some of the students affected by the lack of sight attend the schools in their own neighborhoods. The exact number of these children is not known since there is no systematic inclusion practices under the supervision of the Ministry of National Education in our country. Since there is no systematic application of inclusion, it is not possible to determine the educational needs of these children, to prepare programs to meet them and to provide support services for students and class teachers.

When we look at the mathematics module of the curricula of this schools, it can be seen that abacus, voice clock, Braille math teaching slate and cubes kit, tactile clocks are included to be used for visually impaired or blind students. The whole module takes 200 hours (MoNE, 2008). To enhance this curricula, new instructional materials are needed.

In Turkey, teacher candidates have not got any specific course about teaching mathematics for disabled students during their education. Thus, they don't have enough perspective on teaching visually impaired children (Köseler, 2012). Bülbül (2013) states that teachers must focus on "how to teach more than they can not learn". They are suggested to create their own materials for visually impaired students to learn graphs. On another study, Bayram et al. (2015), highlights the problems that visually impaired students encounter during inclusive education. Difficulties about teaching mathematics is also experienced in other countries (Akakandelwa & Munsanje, 2012; Healy & Fernandes, 2011; Pritchard & Lamb, 2012).

Cryptology, is a kind of playing with numbers activity. It can be defined as, "the study of codes, or the art of writing and solving them" (Cryptology, 2019). Playing with numbers helps to develop a positive attitude towards mathematics. So, students need to spend time with cryptology to like mathematics. This study intends to investigate the effect of a new material designed and prepared by the researchers. The material is a kind of criptology material named "Silindirlog".

Purpose

The aim of this study is to determine how the use of "Silindirlog" material in cryptology teaching affects the students' creating a crypto skill.

Importance

There is no scientific publication on cryptology in visually impaired individuals. In this respect, our study is considered to be the first in the literature.

2. METHOD

2.1.Model

In this study, data were collected by experimental method. The experimental research approach is the research method which is created to reveal the relationships between stimulus and response. An experimental research approach can be used to identify causal relationships, as it allows the systematic changes in one or more variables to be observed (Johnson & Christensen, 2008: 292). One group posttest design was preferred for this study. In a one-group posttest only design, a treatment is applied (or an independent inconstant is influenced) and then a reliant inconstant is measured as soon as the treatment is applied.

2.2.Data Collection

Silindirlog material was prepared first. For this, 3D printer, PLA Flement, Bristol paper, adhesive were used. The design of the Silindirlog material is shown in figure 1.

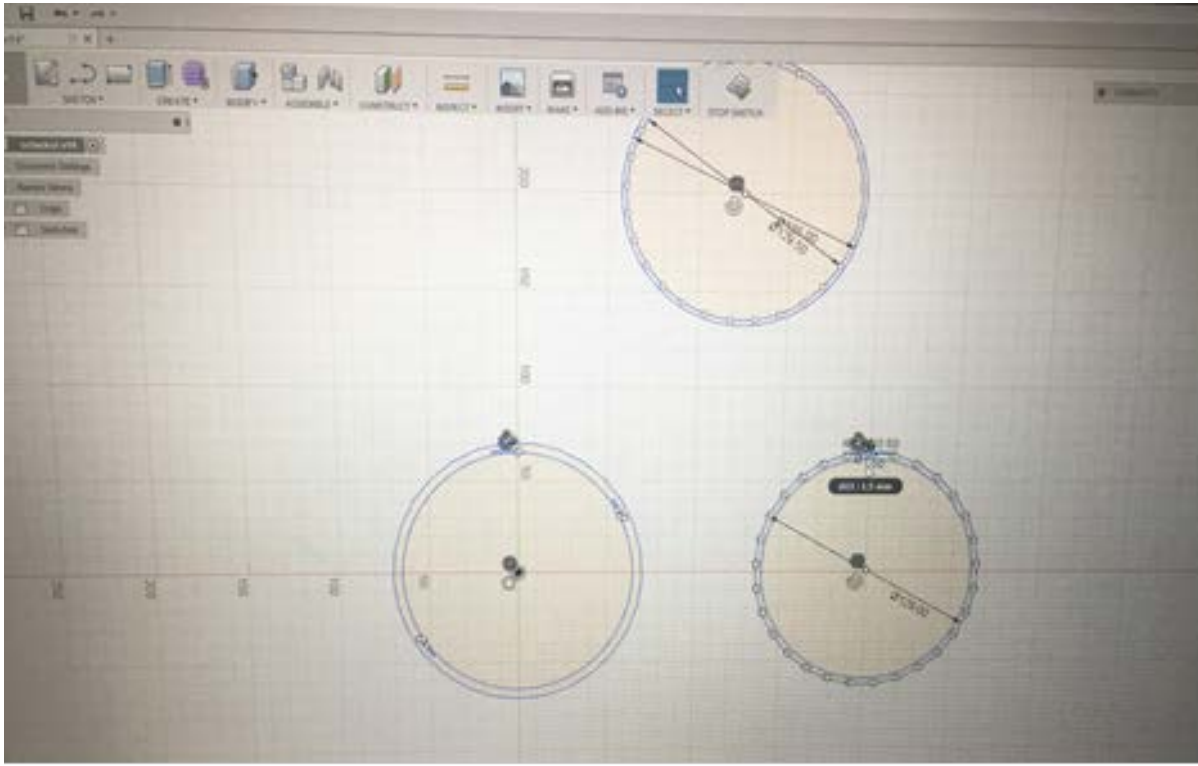


Figure 1: Screenshot for Silindirlog design

After completion of the design, Silindirlog material is produced in 3D printer. The lejants were written according to the materials and then were placed on Silindirlog material (figure 2).



Figure 2. Silindirlog material

The feaature of the material are listed in table 1.

Table 1.

The feaatures of Silindirlog Material

Feature	Silindirlog
Number of Layers	5
Number of Slices	29
Braille Letter	Yes
”Click“ Sound During Return	Yes
360 Degree Rotation Around Its Axis	Yes
Reset cursor	Yes

A field study was conducted to see the applicability of these materials. In the field study, two students were given an application. In the field test, the visually impaired students are expected to realize the task to solve the the text “WE ARE NOT DISABLED“ on Silindirlog. Students were observed about to creating a crypto in accordance with a control list that is focused on reaching the hidden word. By completing the each word, the observer ticked the list so the process was observed till the students perform all the tasks.

2.3.Participants

The students were chosen purposefully in this qualitative research to get healthier information (Lincoln & Guba, 1985). Purposeful selection is a method broadly used in qualitative study for the identification and collection of information-rich circumstances for the maximum operational use of partial means (Patton, 2002). It includes categorizing and choosing persons or clusters of individuals who are specifically familiar about or skilled with a phenomenon of interest (Cresswell and Plano Clark, 2011). Besides to familiarity and capability, Spradley (1979) and Bernard (2002) reminder the significance of ease of use and enthusiasm to take part, and the skill to talk skills and ideas in a communicative, open, and deep means.

The participants was a cluster of students that visually impaired who had knowledge wide-ranging middle-school education. The short summaries of the participants are existing as part of the results section. Fictitious name are used to identify the students. Data collected through observations done during the experimental process.

In this study, two whole sightless students were took part to test the Silindirlog material. 11-year-old a male and a female participated in this study.

Ali (11 years old). He has been in general education during his school time. He is in 4th grade. He is totally blind. Ayşe (11 years old) She has been in general education during her shool time. She is 4th grade. She is totally blind.

3. RESULTS

Silindirlog material was applied to the students and both students managed to develop the password. According to this result, Silindirlog material can be used for underdeveloped hand control and weak motor skill students to create crypto. It has been observed in the study that it is easy to create crypto for visually impaired individuals by silindirlog. Although this material is designed for visually impaired individuals, it can also be used for people with low vision disabilities, mild, moderate and severe mental disabilities due to changes in design. Different designs can be created and organized in the form of activities in order to be able to apply these individuals in the schools they continue. The material is economical and can be widely used due to this feature. Encryption text methods to be applied by teachers can be diversified and developed by considering the visually impaired individuals who will use this system.

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