

Doodle Bug (California Lutheran University)

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Doodle Bug Writing Aid

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Abstract:

The Doodle Bug Writing Aid is a small, inexpensive device that is simple to use to help those with hand injuries, congenital malformations, or arthritis hold a pen or pencil in order to write independently.

YouTube video at <http://youtu.be/rppW4mF6gTs>

Introduction / Background

Hand deformities occur in approximately 1 percent of live births (1). Not all of these hand anomalies preclude handwriting and many are mitigated by surgery, but for a variety of reasons, a surgical remedy is not always possible. There are

many pencil grips and writing aids on the market; however, nearly all of these rely on the ability of the user to grasp them. Some of the congenital hand deformities preclude that as they involve fusion or absence of fingers.

Problem Statement

The Doodle Bug Writing Aid began as a project to help one particular client: a toddler born with CHARGE Syndrome. In addition to this congenital condition that affects her hearing and vision, she also has a cleft right hand.



Cleft Hand

[According to *The American Heritage Medical Dictionary* (2007), a cleft hand is "A congenital deformity in which the division between the fingers, especially between the third and fourth fingers, extends into the metacarpal region. Also called split hand."]

Although "Nadia's" left hand is formed normally, she has demonstrated a clear preference for right-handedness. Because of her medically fragile condition, surgery to repair the hand was delayed until the age of two and a half. However, the surgery could only provide a partial solution. We wanted to create a device that would enable her to draw and learn to write to help with her cognitive and motor development despite her inability to use a pincer grasp.

As educators, we understand the importance of drawing, doodling and learning to a child's development. Many studies have shown the value of a child being able to learn letter formation and writing through drawing and doodling play.

"Handwriting, e.g., using the hand to form letters on a page, is essential in the writing process and can predict the amount and quality of children's written ideas." (2)

"Natural literacy development is dependent on the experiences the child has through reading and writing activities." (3)

Also, as Nadia has diminished hearing and vision, we felt that a multi-sensory (tactile) approach would give her the greatest access to language development in the future.

Design and Development

As our client is a toddler, the device needed to be something easy to use, sturdy and child-friendly. Additionally, as she already has equipment to aid in her other medical issues, we wanted something that didn't look like another "medical appliance."

We created a device that would provide a stable platform on which to rest the hand. A round wooden base is covered with felt on one side. A pencil (or pen or crayon) is secured at a natural angle for writing, and a ball-bearing caster attached to the bottom allows for easy mobility. The crayon or pencil can be easily and quickly changed out as desired. A small motion enables the user to lift the pencil (between strokes/letters). A child-friendly ladybug design (made from felt or soft foam) completed the package.

The total cost for each device is slightly less than \$4, which means that cost is not a deterrent to distributing the Doodle Bug to those who can benefit from its assistance.

Evaluation and Results

Shortly after the first prototype was completed, a 6th grade student in another school suffered a hand injury that left her in a cast and unable to grasp a pencil or do her own writing work. The student was experiencing frustration and anxiety while trying to complete a math test. Even though she had someone writing the test answers for her, she found she could not do the necessary calculations unless she wrote it down herself. As a result, she struggled, attempting to write down the math with her left hand. She also expressed concern that she had a spelling test later that day and would have to take it in a separate room so she could spell the words out loud.

We gave her our device to try. After just five minutes of practice, she was able to write legibly enough to take the spelling test in class with the rest of the students. Additional practice improved her legibility even further, and she continued to use the Doodle Bug for her written work throughout her time in the cast.

After seeing her success and enthusiasm for the project, we have expanded the testing base for the Doodle Bug to include input from occupational therapists,

arthritis sufferers, and individuals recovering from hand surgery. As part of our field testing, we have also sent in a request to the Arthritis Foundation to test our device with their expert panel for their “Ease-of-Use Commendation.” (4)

Discussion and Conclusions

The usefulness of the Doodle Bug Writing Aid extends far beyond our original client. This device is an intuitive, easy-to-master aid for anyone experiencing difficulty writing using a traditional pincer grip.

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Website: <http://write-aid.weebly.com/>

References

- (1) <http://www.pncl.co.uk/~belcher/information/Congenital%20hand.pdf>
- (2) Edwards, 2003; Graham, Berninger, Abbott, Abbott, & Whitaker, 1997; Graham, Harris, & Fink, 2000; Jones & Christensen, 1999
- (3) http://www.bridgew.edu/library/cags_projects/lthomson/web%20page/r-w%20connection.htm
- (4) <http://www.arthritis.org/resources/ease-of-use-new/>

This project can be viewed at <http://aac-rerc.psu.edu/wordpressmu/RESNA-SDC/>