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ebb

Technical Report and Feasibility Study

Executive Summary

The furniture industry is currently lacking a variety of pieces specifically catered to disabled populations. Affecting roughly 20% of children and millions of adults internationally, learning disorders are especially forgotten since the mental disability is difficult to translate into physical needs. However, sensory imbalances at the heart of such issues can be mitigated through tactile stimulation. *ebb* introduces an artistic and functional set of furniture to help people with difficulties focusing and managing their energy while working. By integrating tactile stimulation into furniture, *ebb*'s focus on catering to such a specific, yet widespread community has allowed the exploration and benefits of textural design in our environments.

Introduction and Project Background

Recent trends in mainstream fidgeting tools and autism awareness have increased the recognition of 'focus helpers' in affected children's homes and classrooms. However, while the industry for child-friendly and portable toys has been developing, it has become less socially acceptable for adults with learning disabilities in professional situations to use such tools associated with children. And although there is a lack of furniture with built in focusing tools, creating furniture specifically catered to children would be difficult. This is due to constantly changing anthropometric data and less control over their ability to stay interested and focused on a piece of furniture for an extended period of time (Laurie and Stein). As a result, *ebb*'s target range includes adults with learning disabilities in the workplace, but can be expanded to include older children in the home or classroom as well.

Meanwhile, another sector in portable spaces has gained popularity in recent years. By allowing all of its components to either fit into or extend from a wall, *ebb* effectively utilizes this trend to allow the inclusion of focus helpers into various communities with small spaces. Lower-income communities that are often disadvantaged by the lack of focus helpers could benefit from building 'pop-up' traveling workplaces or classrooms.

Market Demand

The market for furniture dedicated to aiding people, children included, with learning disabilities is scarce compared to the high percentage of the population dealing with these issues. Roughly 20% of children (1 in 5 or 2 to 3 per classroom) have difficulty focusing and directing unwanted energy to something more productive. ("Types"). These children grow into adults with an even wider and more confusing range of learning disabilities ("How many"). In tune with the growing need to help adults, *ebb* could be purchased for the company workplace in an effort to provide a more diverse and inclusive work environment. A small portion of school funding or external aid could be directed towards putting *ebb* in a few classrooms. People with learning disabilities living in urban small spaces, could especially benefit from an artistic piece with built in focus helpers. Research has also shown that seniors with Alzheimer's and dementia benefit from tactile stimulation as well, making *ebb* appropriate for

nursing homes. On the other hand, *ebb* doesn't have to be specifically used by people with learning disabilities, but also functions as a piece of aesthetic furniture.

Design Analysis

A brief introduction: The need for tactile stimulation stems from sensory dysfunction, often associated with learning disabilities. The brain's processing area for sensory stimulation may be over or underactive. Most people with learning disorders tend to be over active on half, while under on the other. This creates the need to exercise the weak side, until it catches up to the overactive side. As a result, *ebb* employs a ribbed, wooden texture and bouncy ball seat to stimulate either half ("Teaching").

Locked into place, artwork up



By itself, the underside of *ebb* looks as if it is a piece of art in a gallery. Its metal legs, when folded in, give the appearance of a frame, while the underside of the two chairs complement the blue space in between. Mimicking the ebb and flow of water, *ebb* as a work of art seeks to represent the ups and downs of human emotion, and the balance it hopes to create for those with special needs. Furthermore, *ebb* is a statement piece: a work of art specifically created to recognize the beauty of learning disabilities.

Table pulled down, legs folded out, front privacy screen pulled out, chairs expanded

The underside of the table uses a wooden structure to provide the satisfactory feeling of running your fingers along a ribbed texture. Different forms of tactile stimulation are provided in the same wooden skeleton covered

by quilted or mesh, nylon fabric, both of which are soft and pleasing to touch. In case of feelings of embarrassment or insecurity touching the undersides of the table, privacy screens are provided on all three sides to block external activity (Bachand). Furthermore, the inclusion of an exercise ball seat directs unwanted energy towards bouncing up and down, like a leg jittering. A normal seat is an available option for the user if they don't need the stimulation of the exercise seat. Concerning ergonomics, the chairs are of standard height at roughly 17 inches, and the table stands at 30 inches, with the wooden textures extending (at most) another 7 inches downwards. Although the extensions create a smaller gap for the legs, the smallest extension is only roughly 2 inches, allowing enough space for one user on each side. Also, the motion of running your fingers along the texture tends to relax your wrists from their usual typing or writing position while working. For a more detailed explanation of use and function, see the attached Design Explanation.



Production Costs

Laser-cut wooden panels (for the texture)	\$456 USD (table) + \$76.50 USD (chairs)
Beech wood	\$112.80 USD
Wooden wall	\$600 USD
Stainless steel	\$132 USD
Latch and hinge	\$15 USD
Recycled upholstery	\$45.70 USD
Labor	\$200-400 USD

Statement of Viability

Due to the unique target group and complex nature of the furniture, the project may be more expensive to produce than simpler furniture. However, by CNC laser cutting the difficult curves of the wooden textures, the assembly of the tactile stimulation wall is simple through gluing and sanding. This project provides great flexibility in its material capabilities. Mechanized mass production with extraneous labor costs would make *ebb* a feasible, and rather necessary product to introduce to the market. With the rise of urban housing, the space saving feature of *ebb* allows for easy installation and function as a table, chairs, and piece of art. The product's limitations are mostly concerned with the specific nature of the target group and inclusion of a wall with purchase. However, *ebb* can function as pieces of standalone furniture as well. Even if there is no wall, or need for a wall, to install on, the furniture are complete by themselves; the wall is merely a means to store the table and chairs. Although the standalone artistic effect is lost, the function and essential purpose of the furniture is fulfilled. In such case, the aesthetics play a lesser role relative to *ebb*'s objective: providing sensory balance.

Sources

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