



Tactile Learning Toys for Blind Kids

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ABSTRACT

Tactile toy which is specially designed to stimulate one or more of the senses and involves the sensation of touch and texture. The researcher wants to empower the blind kids' natural curiosity to reach out and explore, develop fine and gross motor skills, develop hand coordination, desensitization and encourage success and open discussion using the tactile sensory toy. The researcher highlights the issues such as lack of sensory toy for blind kids in Malaysia, existing toy's design and material are inappropriate for them and existing toy are not durable and easily damaged. This research aims to create sensory toy for blind kids that can develop their hands on and sensory skills, to create a suitable design and material toy that will help them to involve in lesson and play-based activities and to produce high quality and durable toy. Questionnaires by Google Form was created to examine the community's knowledge about tactile sensory toy for blind kids. According to the study's findings, most of the participants, agreed that tactile sensory toys for blind children should have various textures and need touch with the hands or feet. In fact, studies have proven that game-based learning is beneficial and useful for blind children, and that using this approach of education would make learning more intriguing for blind children. Designing a tactile sense game requires careful consideration of the type of material or texture since tactile sensory toys may also help blind youngsters become more sensitive. As a result, tactile sensory toy was created in high quality and durable toy which designed for blind kids using various types of textures that will help them to involve in lesson and play-based activities.

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1.0 INTRODUCTION

Play is essential to optimal blind kids' development because it contributes to the cognitive, physical, social, and emotional well-being of blind kids and touch is how blind kids first discover the world [1]. It also offers an ideal and significant opportunity for parents and other caregivers to engage fully with blind kids using tactile sensory toy as an instrument of play and interaction. The evolution

of societal perceptions of tactile sensory toy from blind kid's playthings to critical facilitators of early brain and blind kids' development has challenged caregivers in deciding which toys are most appropriate for their blind kids [1]. According to [2] playing is always been considered to be of primary importance for blind kid's learning. Therefore, early childhood curriculums provide opportunities for blind kids to play and interact with tactile sensory toy. The relationship between play and learning is proved by researchers, practitioners and parents. Especially integrating new technologies in creating toy to learning environments bring some benefits for blind kids [3].

Living life as a visually impaired person is very different compared to someone who has perfect vision, the whole 24 hours of our life is an ordeal that no simile can fit into words. The movement of a blind person is very limited and so is the opportunity to earn a living to support the family which is often very painful. This is because there are not many job opportunities offered and if there are, the number is very limited, and there is no term 'choice' for us. According to a report by the World Health Organization, there are more than 285 million visually impaired people in the world today. Of that number, only approximately 50,000 people are registered with the Malaysian Welfare Department, and it is believed that another 50,000 are not yet registered for certain reasons [4]. The small percentage who are registered is due to the lack of awareness of the opportunities they can engage in and efforts to improve the situation they face. Furthermore, according to Bernama, Malaysia has relatively little Braille literacy [5]. Only 30% of blind persons who have registered with the Welfare Department are proficient in Braille. Those who are blind from birth or at a young age are typically sent to special schools that teach Braille, according to Azmi Abdullah, a coach with the Malaysian Association for the Blind in a community-based rehabilitation programme. They benefit from exposure to the written language. People who go blind later in life might not have such an opportunity though [4]. Meanwhile, Chairman of the Human Capital Development Committee, Malaysian Visually Impaired Organization (SBM), Dr Ahmad Shamsuri Muhamad said one of the biggest challenges for the group is the lack of reading material in braille, which is so lacking in the market at the moment. Braille machines for special education schools are also still insufficient. In the past, visually impaired students were provided with a braille machine each, but now it has to be shared by two people, causing constraints for them to gain access to study well [5]. Therefore, he suggested that information in braille should be increased so that visually impaired people have the same opportunity to gain knowledge as normal people, in addition to improving public facilities for the concerned group. Every blind person aspires to live independently, it's a reality. This group only asks for a little respect, awareness, and understanding. an item you can distribute. Many of them are truly competent and capable of improving both themselves and society at large.

Esposito [6] stated that, a tactile sensory toy is one that is specially designed to stimulate one or more of the senses. Sensory toys may be more appealing to blind kids on the spectrum because they can help the blind kids remain calm and provide the sensory experience they want. Tactile sensory toy stimulation involves the sensation of touch and texture. Blind kids can learn to identify similarities and differences among textures in tactile sensory toys enhances cognitive and language development [6]. Tactile sensory toy encourages learning through exploration, curiosity, problem solving and creativity. It helps to build nerve connections in the brain and encourages the development of language and motor skills. There are many benefits that may go unnoticed, such as the development of abilities to focus and block out distractions [7]. Tactile sensory toy for blind kids is about hands-on activities and sensory skill that stimulate all or most of their senses. It helps with language skills by engaging the senses, blind kids will learn how to describe what they're doing and how it feels, eventually using more descriptive words to communicate. It also helps with cognitive growth by asking questions, thinking about how things work, doing sensory experiments and analyzing results are all part of healthy cognitive growth. It encourages them to explore how to play and engage with different experiment and texture as well as how to solve challenges they encounter using tactile sensory toy [7].

2.0 LITERATURE REVIEW

2.1 Tactile toys

The usage of tactile toys can assist introduce young children to a variety of touch sensations in fabrics that they will come into contact with on a regular basis, such as their playthings or daily requirements [8]. Another research was conducted by [9], early childhood development is vital for sensory awareness development and the exploration of various textures, shapes, and materials by young children. To promote exploration and sensory stimulation, tactile materials are frequently used in schools and playgrounds. Fabrics, plastics, papers, feathers, and other materials with various tactile sensations are just a few examples of the many textures that may be used to create these materials. "Treasure hunts" are a well-liked technique for encouraging kids' tactile exploration in a learning or play setting. This entails concealing little toys or other items in a jar full of sand, pasta, rice, shaving cream, or Play-Doh. Children refine their sense of touch and gain the ability to distinguish between various items by looking for and identifying them [9]. Miller [10] The usefulness of occupational therapy-sensory integration method in enhancing children's sensory responsiveness, social behavior, motor competence, and involvement in meaningful daily activities was examined in a controlled experiment on three groups of kids with sensory processing disorder. The trial's results revealed that, in comparison to the other two groups, the occupational therapy-sensory integration group significantly improved in each of these categories. When a person has sensory processing disorder, their brain has trouble processing and reacting to environmental sensory input including touch, sound, and light. Social connections, physical abilities, and daily tasks may become challenging as a result. A form of therapy that focuses on assisting patients with sensory processing is occupational therapy-sensory integration [10]. In a study done by [11], they looked on the therapeutic benefits of deep pressure touch when occupational therapists employ the sensory integration strategy. The findings of this study imply that deep pressure exercises used by occupational therapists help enhance proprioceptive awareness in kids with autism and other spectrum disorders. These resources are readily available in many home and community settings and provide kids a safe alternative to taking oral drugs [11]. The review concludes that sensory integration approach indeed shows evidence that children do respond to sensory integration positively by reducing the child's behavioral responses to environmental stimuli, modulating of child's cortisol levels as well as allowing better school and social participation.

Tactile Toys As mentioned by [8], children are treated with the Sensory Integration Approach by occupational therapists, so it's critical to understand the precise therapy techniques used for these kids as well as how therapy is delivered to them. Following that, a review of the present textile-based materials used for tactile treatment on kids with tactile dysfunction and the use of general textiles as therapy will be done. The principles of applying the heat setting technique to fabrics in order to generate three-dimensional structural qualities, a crucial element in the design of tactile toys will next be covered. The conclusion of this research is also supported by the application of human computer interaction technology in special needs therapy. Last but not least, a summary of how the fusion of all the aforementioned research areas led to the development of tactile toys will show how these toys can support tactile therapy currently in use and eventually help children overcome dysfunction and respond appropriately to tactile stimuli in their daily lives [12].

2.2 Selecting, adapting, and applying tactile sensory toys (tactile for learning)

A very good stated by [13] good toys entice kids to enquire, "How can I play with it? How can it play with me, then? and offering a variety of play activities is another quality of good toys. Children should be able to utilize toys in various forms of play with complete physical and mental freedom. The best course of action when positioning in the design discipline is to provide some appropriate play activities [13]. Langley [14] found that blind kids' reactions to toys can differ depending on their

sensory and response limits, their cognitive development, and the caliber of the experiences they receive. When designing play activities and choosing and utilizing toys, it is important to recognize and take into account the unique developmental demands that each developmental challenge (motoric, visual, auditory, emotional, and cognitive) generates. Therefore, it's crucial to draw attention to and concentrate on the criteria for choosing, customizing, and using toys for each developmental issue [14]. Finally, the last issue concerning thoroughly all the sections of their lives which visually impaired children should do much more than sighted children is memorizing. Memory of a blind person provides to him/her: orientation, mobility, learning, communication and socialization. There are many things to learn and memorize for visually impaired children. Repetition, either the necessary actions or exercises, may be the key tool that functions not only for memorizing but also for understanding, and learning [15].

Özyürek [16] children with visual impairment need to know positional vocabulary such as their sides (right and left), up and down and the notions as- on the top of, under, inside, beside, over, front, on, in, etc [16]. According to the study by [17] when it comes to children's growth, in particular, there is a strong connection between learning, moving, playing, and practicing. In particular, play activity is essential for fusing movement and learning. When kids play, they might pick up new abilities like problem-solving, socialization, and physical coordination. In order to encourage imaginative and explorative play, which in turn enhances children's cognitive, social, and emotional development, toys and play instruments are an essential part of play activities. The mentioned design project intends to demonstrate how toys and play tools may be particularly developed to enhance visually impaired children's learning and daily living abilities while still offering a fun play experience. These design tools can make it easier to practice crucial skills in a fun and interesting way by combining learning with play, which can be especially helpful for kids with visual impairments who might need extra encouragement or stimulation. Ultimately, there are many different ways that learning, moving, playing, and practicing are related to one another. Yet, by including play activities and intentional design, children may acquire important skills while also enjoying themselves [17]. According to [18] the three key ideas that improve toy quality during the design process are play value, empathy, and aimlessness. Aimlessness is the belief that toys shouldn't have a clear objective or function but should instead encourage free-form, imaginative play. Children are encouraged to use their creativity and problem-solving abilities by doing this. While making toys, designers should exercise empathy by taking the child's viewpoint and experience into account as well as the child's physical, emotional, and cognitive growth. The total enjoyment that kids have when playing with a toy is known as play value, which may be increased by elements including sensory stimulation, novelty, and the capacity to alter or personalize the object. A positive play experience encourages kids to use their imagination and creativity, which runs counter to the notion that winning is the most essential component of play. Although while winning or losing might happen in games, it shouldn't be the main emphasis. The pleasure and happiness that children derive from playing with a toy also determines its play value. A youngster who loves and treasures a toy will get more use out of it than a child who discards it right away. While designing high-quality toys, designers must take aimlessness, empathy, and play value into account. The most effective toys for enticing and educating kids are those that foster imaginative and creative play, show empathy for their needs, and have a high degree of play value [18].

2.3 Design and material toys for blind kids

The importance of ages 0-3 years of blind child life is considered the cornerstone of all dimensions of health for the rest of the blind child's life, which is the period in which blind children grow rapidly and there are many changes in every aspect of development [19]. Hence, it is very important to learn the factors that are relevant to the design of toys for blind kids aged 03 years from development, behavior of blind children, and the characteristics of blind children's toys that are suitable for the ages, including safety [19].

Metatla [20] stated that despite being included in mainstream schools, visually impaired children or blind children still face barriers to social engagement and participation. Games could potentially help, but games that cater for both visually impaired and sighted players are scarce. Hence, used a co-design approach to design and evaluate a robot-based educational game that could be inclusive of both visually impaired and sighted children in the context of mainstream education [20].

According to [12] key developments within the industries of play and contemporary toy design that address sustainability in blind kid's toys from two perspectives which are the first is from the design and production perspective, and the second is from the use or play perspective [21]. Good toy design for blind kids aims at producing play value derived from raw material, aesthetics, mechanics, relations to storytelling and so on, but as a vague and subjective measure, play value blind kids can present different things for designers and players of different ages, depending on their ideas on the life cycles of toys and their qualifications for sustainability. Instead, relevant and more tangible aspects of play value are the physical durability of toys, which may refer to the ecological dimensions of the raw material used for toys (such as textile, wood or plastic), their functionality (afforded, versatile and enduring functions for toys such as mechanics) and the thematic durability of toys (such as intriguing backstories that invite the player to long-term play).

2.4 Logo

According to [21] logos as visual cues can help firms convey their unique identity and attract consumers' attention. Despite the importance and prevalent use of logos, the logo literature remains fragmented. In fact, it is important in the implementation of many graphic elements to design a special structure known as a logo. To design a logo, it is important to have excellent knowledge in graphics, color management, geometric shapes and communication [21]. Adîr [22] stated that, a logo should speak volumes in several elements. It is an identifying element that reflects the attitude and values of a company or campaign and it is difficult to build just a method to design a logo. There are two stages which are the research stage and the design stage. For the first stage, there is a lot of necessary information about the campaign, the advertising, the target people in this campaign. The second requires graphic elements, colors, images, symbols in a harmonious concept. By knowing these elements which are theory and graphics, anyone can create an attractive logo. In addition, we have tried to realize a small part of the logo design book related to graphic strategy [22].

3.0 METHODOLOGY

To formulate this research, this study used exploratory research as a methodology. For the objective of collecting information and answering the research problem, the researcher uses the type of study and research that is qualitative and quantitative. The qualitative interview method was used to gather feedback from teachers and obtain detailed information about blind kids at Sekolah Pendidikan Khas Kuala Terengganu. The quantitative technique will be carried out through a survey, where a set of questionnaires will distribute to randomly selected groups aged 15 and above. The purpose of using this set of questionnaires is to obtain data and opinions about the recommendations and a general and open explanation in psychology about the problem statement contained in this campaign. Moreover, this data archive will be used to collect more information and literature review about tactile toys for blind kids using books, magazines, journals, articles, websites, newspapers and other sources. After that, the data from the method used will be analyzed to suggest a design to produce this toy product.

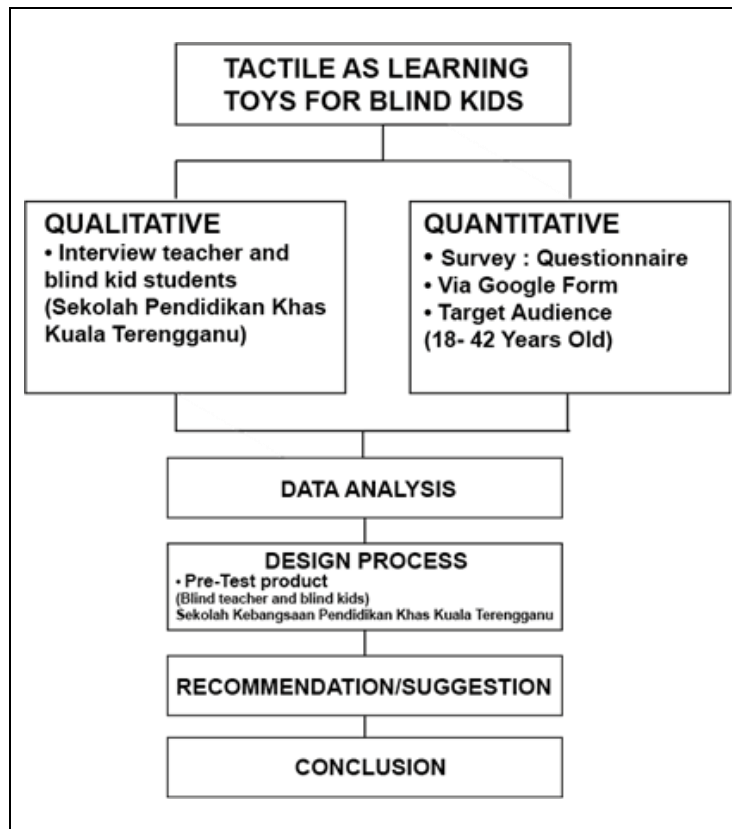


Figure 1: Flowchart of the Research Methodology Process

4.0 IMPLEMENTATION (DATA ANALYSIS)

The qualitative interview method was used to gather feedback from teachers, which indicated that the product needed improvements in its design, such as adding braille, to make it easier for blind children to recognize numbers and for mild and fully blind students to use. Additionally, it was suggested to add more materials that blind students can use, such as kinetic sand in addition to clay to improve their fine motor skills. Based on the survey which is Online Questionnaire, the data analyzed details that obtained from the data collected. The online questionnaires were given to random respondents. They were asked with different section in a set of the questionnaires. The set of questionnaires divided to three section which is Section A (Respondent's Demography), Section B (General knowledge about Tactile Toys for Blind Kids), and Section C (Design Proposal and Logo Design for Product Branding of Tactile Toy for Blind Kids). The purpose of this questionnaire's session is to get opinions about suggestions and explanations in general and openly about a problem statement that is in production of Tactile Sensory Toy for Blind Kids of those involved, 168 random respondent or public community completed the questionnaire. Google Forms apps were used to create a complete questioner to distribute to public community. Links to the questionnaires were released on a WhatsApp app message via Google Form. The questionnaires were anonymous and confidential, and the participants were given the opportunity to consent to taking part prior to completing them. A total of 125 women and 43 men participated in this study, 99.4% of them were Malay and aged 15 years and above. Status from the data has shown that a total of 108 respondents are single and 57 respondents are married. In fact, 50% or 84 of the respondents are students. Because of this, 52.1% or 87 of the respondents have no income because they are still studying.

Based on the results of the study, 164 people or 97.6% of the participants, agreed that tactile sensory toys which have different textures and require contact using hands or feet, are appropriate for blind kids. In reality, research have shown that game-based learning is effective and successful for

blind kids, and this method of instruction will make learning for blind kids more fascinating. Additionally, tactile sensory toys also can improve sensitivity in blind children, so it is crucial to consider the sort of material or texture while designing a sense of touch game. In addition, the study discovered that the used of different textures in tactile sensory play might enhance learning and support the social development of blind children. The researchers also discovered that tactile sensory toys are safe for blind kids to play. Moreover, the ideal and advised age range for playing tactile sensory games is between 3 and 5 years old.

The results of this survey will be used to create "Tactile Toys for Blind Kids". The researchers' findings suggest that tactile sensory toys for blind kids should be increased because the community have difficulties in finding tactile sensory toy for blind kids in Malaysia that specially using design and materials that suits them. Therefore, tactile sensory toy needs to be created in high quality and durable toy which designed for blind kids using various types of textures that will help them to involve in lesson and play-based activities. From the collection of data, the creation of a geometric logo that used a combination of symbols and text is the most important element for tactile sensory toys because with the logo, the audience can clearly recognize the name of the product. In fact, the important things to consider before creating tactile sensory toys for blind kids are texture, size, weight and quality. Furthermore, the things that are prioritized in tactile sensory toys for blind kids are using high quality, nondestructive and variety of different textures such as rough, soft and fluffy so that tactile sensory toys for blind kids can grow in the market in Malaysia.

5.0 DESIGN PROCESS



Figure 2: Pre-Test Learning Toy (wooden number for blind kids)

A wide range of print images that contain information presented in visual formats can be represented using tactile graphics. diagram, illustration, graphic, figure, and drawing, among others. These graphics may be created using a number of techniques and materials. They provide a tactile representation of diagrams and information offered in print to go along with textual information. Innovation on fundamental instructive channel toward teaching kids letterforms (typography), vocabularies also the exterior shapes irrespective of the size especially kid-playschool to standard eight [23] and the characteristic on tactile graphics or 3D model should be small and easy to handle and fit on the table or any place. The component should fit together so that they will not be moved about when explored tactually [24]. By using the Guidelines and Standard for Tactile Graphic, design tactile graphic for early grade it's important that material include tactile graphic, match picture to sound, letter, word or sentences (phonics and ask the students to circle all of the picture), draw a shape configuration to identify words, "read" the story or "word" and perform handwriting tasks. Best educational practice include alternate activities that support the students in acquiring the skills of literacy, numeracy and graphicacy [25].

The main purpose of going to the special education school for blind children that is located in Kuala Terengganu (Sekolah Kebangsaan Pendidikan Khas) is to test Wooden Numbers for Blind Kids and get input from the school's teachers and blind students. The teachers and blind children have suggested that braille components be added to Wooden Numbers to make it quicker and simpler to identify each number. In addition, it is believed from the comments that there are other choices and materials besides clay that will aid in their participation in educational and game-based activities, particularly kinetic sand, which will help them develop their hand and sensory skills and it can use for mild and fully blind students. Overall, Wooden Numbers was greatly influenced by the instructors' and students' input so that the design could be improved to make it more effective for blind children to learn and play at the same time using Wooden Numbers.



Figure 3: Sketches Idea

In the beginning, 30 sketches of various tactile sensory toys were made, and the two finest ones were chosen to be utilized as idea of tactile sensory toys for blind kids. Two sketches or drawings that have different benefits and purposes were combined to make a perfect tactile sensory toy for blind kids. Because they have a strong structure, good benefits, and fill in the gaps of cons in both of each tactile sensory toys, the two designs are joined to create a tactile sensory toy for blind kids. The subject of the first tactile sensory toys sketch or drawing is learning the alphabet or uppercase and lowercase letters while utilizing the texture of plasticine into the alphabet. However, after the researcher discussed and examined each of the necessary materials and costs, the first sketch of the tactile sensory for blind kids on learning the alphabet was changed to learning numbers for blind kids. The second sketch or drawing is about learning variable of textures which are soft, rough, beads, fluffy, smooth, hard, velcro, pizza board that have different texture and the bubble wrap texture using the clothes pin. So, the blind kids need to sorting the clothes pin which have different texture to the correct and same texture on the board. However, after the researcher examine each cost of the texture, the final types of textures were change to glitter texture, wavy texture, rooted texture, flowers texture, soft texture, hairy texture, rough texture, line texture, diamond texture and hairy texture.

The development of the idea to make a tactile sensory toy product is based on data collected in a questionnaire survey via google form that has been distributed in the WhatsApp application. In fact, texture, size, weight, and quality are the key factors that have been taken into account while developing tactile sensory toys for blind children. Researchers have utilized premium, non-destructive materials and a range of textures to increase the market acceptance of tactile sensory toys for blind kids in Malaysia.



Figure 4: Mock-up.

The researcher created a sturdy mock-up for tactile sensory toy for blind kids using colour foam board, plasticine, and boxes as containers after determining the optimal size for the toy. Before a product composed of high-quality materials is produced, tactile sensory toys are demonstrated using mock-up, which are creative renderings of a design or product that illustrate the toys in use.



Figure 5: Process of Cutting Using Laser Cutting Machine and Carpenter Glue.

A laser cutting machine is the primary instrument or machine utilized to create this tactile sensory toy product. The laser cutting equipment is crucial to the production of this toy product because it is utilized to cut wood to the appropriate size toy for blind kids, which is A5 size. In actuality, laser cutting machines offer several benefits during the product production process, including the use of high-power lasers, laser-to-optical reflection technology, and 100W of power. Additionally, the laser cutting machine's ideal working space is 1000 mm x 800 mm. Additionally, the machine can cut wood and acrylic with a thickness ranging from 3 mm to 15 mm. In reality, there are benefits to employing this machine, including its ability to swiftly cut plywood and fast carve plywood into numeral shapes. Its big size also makes the product's production process easier. In the event that the machine is damaged, it also has the drawback of having expensive maintenance expenditures. Once the product has been cut using laser cutting machine, the researcher will attach each cut wooden number using carpenter glue to form the final product.

6.0 RESULT (RECOMMENDATION)



Figure 6: Logo Brand for Product

Initially, 10 sketches of various logos were made, and the best one was chosen to be used as a logo for tactile toys for blind kids. For this logo, the researchers employed a cube with the letter "W" and "D" as symbols, and the text is Wooden Number. The logo is on the container to promote the market of the product and to raise number of the tactile sensory toys for blind kids in Malaysia. On the logo, the letters "Wooden Number," "W," and "D" are all written in the Autumn Voyage Regular typeface. Additionally, researchers employ logo forms like the round and diamond to represent texture. The logo's color uses vibrant, contrasting hues to grab the public's attention. Blue-black is the color used on the text "Wooden Number" to provide contrast for the reader and enhance the text's legibility.



Figure 7: Final Product for Tactile Learning Toy for Blind Kids.

The primary material utilized in the production of tactile sensory toys is plywood. Plywood is the material of preference since it has a high level of durability and resistance to harm. In order to produce this toy, five layers of plywood were utilized and the thickness of a single layer of plywood is 0.3 cm. Five layers which are 1.5 cm thickness of plywood were merged to create one piece number of A5 sized. A5 size is appropriate for blind kids which ages 3 to 5 to play tactile sensory toys. One layer of plywood at the top has been separated into two sections which are for number and texture. The numerals 0 to 9 have been engraved into the three layers of plywood. Blind kids may recognize and learn numbers by inserting plasticine into each number to form numbers and then following the form of each number. To allow blind kids to explore each distinct texture according to the number, various diverse textures corresponding to the numbers 0 to 9 have been put in the designated area.

7.0 CONCLUSION

Tactile sensory toys are encouraged from a young age and allows blind kids to explore and investigate, whilst having the opportunity to form a hypothesis, experiment and make a conclusion. This process allows the blind kids to refine their thresholds for different sensory information and learn which ones are useful and which ones can be filtered out in their natural environment. All the experiences are important for the children to build up their emotional well-being and regulate their sense of emotions. When combined with guided activities and games, Tactile Toys can engage children's fine and gross motor skills. Tactile sensory toys focus on hands-on activities and sensory skills that engage all or most of blind kid's senses. Blind kids will learn to explain what they are doing and how it feels, gradually utilizing more descriptive words to communicate. It helps with language skills by activating the senses. Asking questions, considering how things function, conducting sensory experiments, and analyzing data are all aspects of healthy cognitive development. According to [8] child with opportunities to experience sensory inputs at just the right level that he can tolerate, along with engaging him in sensory activities that will help calm or alert him. By using that method, the child begins to accept and respond more appropriately to play and daily activities and hence allowing him to live his life in a functional manner.

This aids in cognitive development. It enables blind kids to experiment with diverse play activities and textures, as well as how to use tactile sensory toys to overcome obstacles. In short, it is vital to take into account about the type of material or texture when creating the tactile sensory toys since the toys may also help blind youngsters become more sensitive. Moreover, the used of various textures in tactile sensory toys may help social development and improve learning in blind kids. The use of high-quality, non-destructive, and a range of varied textures, such as rough, soft, and feathered, is also highlighted in tactile sensory toys for blind children in order to help them succeed on the Malaysian market. As tactile sensory toys for blind kids continue to hit the market, it's recommended that parents seek advice from professionals who can recommend suitable tactile sensory toys for their blind kids.

Author Contribution

Saadiah A. Rahman and Md Khairil Hafizi: Implementation, Siti Nur Amalin and Mohd Khairul Anwar: Design, A. Amarah and Nik Nabilah Izzati: Recommendation, Norhayatie Ibrahim: Methodology, writing and editing

Conflict of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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