

**COLORED THREE-DIMENSIONAL(3D) CROCHET SCULPTURES AS
LEARNING AIDS FOR CHILDREN WITH AUTISM: A CASE OF
GOODWILL SPECIAL NEEDS DEMONSTRATION ACADEMY**

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**A DISSERTATION SUBMITTED TO THE DIRECTORATE OF RESEARCH
AND GRADUATE TRAINING IN PARTIAL FULFILMENT OF THE
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DECLARATION

This dissertation entitled “Colored Three-Dimensional(3D) Crochet Sculptures as Learning Aids for Children with Autism: A Case of Goodwill Special Needs Demonstration Academy”, is my original work and has never been presented to any other institution for an academic award.

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APPROVAL

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DEDICATION.

I dedicate this dissertation to the greatest gifts of my life. My family that has supported me both financially and mentally in this journey and friends that have constantly been my inspiration and supported me as well.

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TABLE OF CONTENTS

DECLARATION.....	i
APPROVAL	ii
DEDICATION.	iii
ACKNOWLEDGEMENT.....	iv
LIST OF FIGURES	ix
LIST OF ABBREVIATIONS.....	xv
ABSTRACT	xvi
CHAPTER ONE:.....	1
INTRODUCTION.....	1
1.0: Overview	1
1.1: Background to the study.....	1
1.2: Statement of the problem	11
1.3: Purpose of the study	11
1.4: Objectives of the Study	11
1.5: Research Questions	12
1.6: Significance of the project.....	12
1.7: The Scope of the study	13
Definitions of Terms.....	14

CHAPTER TWO.....	16
LITERATURE REVIEW	16
2.1: Introduction	16
2.2: Theoretical Frame Work	16
2.3 Autism learning aids.....	17
2.4 Autism and Colors.....	22
2.5 3D crochet sculpting.....	32
CHAPTER THREE	42
METHODOLOGY	42
3.0 Overview	42
3.1 Research Design	42
3.2 Area of Study.....	42
3.3 Sample size.....	43
3.3 Sampling technique	43
3.4 Data Collection.....	43
3.4.1 Primary data.....	43
3.4.1.1. Observation.....	43
3.4.1.2 Interview.....	44
3.4.1.3 Photography.....	44

3.4.2 Secondary data.....	45
3.5 Studio experimentation and development of sketches	46
3.5.2 Lessons learnt during studio experimentation	47
3.5.3 Validity and Reliability	47
3.6 Ethical considerations.....	48
CHAPTER FOUR:	49
DATA PRESENTATION INTERPRETATION AND ANALYSIS OF FINDINGS ...	49
4.0 Overview	49
4.1 Autism learning aids.....	50
4.2 Autism and Color	66
4.3 3D crochet sculpting.....	73
CHAPTER FIVE	101
DISCUSSION, CONCLUSION, AND RECOMMENDATIONS	101
5.0 Overview	101
5.1 Discussions.	101
5.2 Conclusion.....	109
5.3 Recommendations	110
References	113
APPENDICES	119

APPENDIX A: INTERVIEW GUIDE.....	119
APPENDIX B: INTRODUCTORY LETTER	125
APPENDIX C; PARENTAL CONCENT FORM.	126
APPENDIX D: MAP OF KIREKA	127
APPENDIX E: LOCATION OF GOODWILL SPECIAL NEEDS DEMONSTRATION ACADEMY ON A MAP.....	128

LIST OF FIGURES

Figure 1; <i>Touch and feel</i>	7
Figure 2; <i>Itten’s subtractive color wheel</i>	10
Figure 3; <i>Color perception in children with autism in a Sensory room that is used in Educational Centers.</i>	23
Figure 4; <i>Diagram of the Pigment color wheel, process color wheel and the light color wheel</i>	24
Figure 5; <i>Color wheel based on subtractive color mixing</i>	24
Figure 6; <i>Hues of red, yellow, green, and blue</i>	26
Figure 7; <i>How children link different colors to feelings</i>	28
Figure 8; <i>A treatise of reflection, refractions, and color of light</i>	30
Figure 9; <i>Symbol of the Autism puzzle umbrella. (Weaver, 2017)</i>	32
Figure 10; <i>The Lionheart project.</i>	34
Figure 11; <i>Standing stone art piece</i>	34
Figure 12; <i>weaving construction of a sculpture using Raffia.</i>	37
Figure 13; <i>Weaven scupture with accessories.</i>	38
Figure 14; <i>Motifs communicating the Kiga icons.</i>	39

Figure 15; Chat in the classroom of Goodwill Special Needs Demonstration Academy with human activities in our sub-county.....	51
Figure 16; Chat in the classroom of Goodwill Special Needs Demonstration Academy with religious leaders.	51
Figure 17; Chat in the classroom of Goodwill Special Needs Demonstration Academy with domestic animals.	52
Figure 18; Chat in the classroom of Goodwill Special Needs Demonstration Academy with dangerous objects	52
Figure 19; Various colours of Beads on a Basket Plate.....	53
Figure 20 ; Sorted beads by children with autism at Goodwill Special Needs Demonstration Academy.	54
Figure 21; Ability class 4 children at Goodwill Special Needs Demonstration Academy learning how to use a weaving machine.....	54
Figure 22; Class room environment.	55
Figure 23; Children at Goodwill Special Needs Demonstration Academy washing clothes with guide of caretakers.	57
Figure 24; Children at Goodwill Special Needs Demonstration Academy cleaning the compound with the guide of teachers	57

Figure 25; <i>Children during P.E lessons at Goodwill Special Needs Demonstration Academy</i>	59
Figure 26; <i>Qigong massage by the care taker at Goodwill Special Needs Demonstration Academy.</i>	62
Figure 27; <i>Child at Goodwill Special Needs Demonstration Academy hugging a teacher.</i>	64
Figure 28; <i>Ugandan art students, children with Autism and other Artists painting after the Autism Awareness conference work shop. Kyambogo University.....</i>	67
Figure 29; <i>A sip and paint after Autism Awareness conference work shop by local Ugandan art students, children with Autism, and other Artists held in kyambogo University</i>	68
Figure 30; <i>Goodwill Special Needs Demonstration Academy Children making art pieces. with the support of care takers. Photo by the researcher. Extracted from a smart phone camera.</i>	69
Figure 31; <i>Flower art pieces drawn by children at Goodwill Special Needs Demonstration Academy. Photos by the researcher.</i>	70
Figure 32; <i>Children with autism at GSND A playing with a colorful piece of cloth and balls. Photo by the researcher. Extracted from a smart phone camera, (2021)</i>	71

Figure 33; child at goodwill special needs demonstration academy refusing the red cup	72
Figure 34; Preliminary studies developed of an elephant.	73
Figure 35; Selected sketches of an elephant to make the 3D crochet sculpture.....	75
Figure 36; The scaffold of inclusive learning.	76
Figure 37; The Magic of Love	78
Figure 38; The researcher curving annealed binding wires to make rings using a bender. Photo by the researcher.....	80
Figure 39; Rolling annealed binding wires on the amateur.	80
Figure 40; Crocheting using acrylic yarn	81
Figure 41; Anticipation of a “Miraculous Tactile Sensation.”	82
Figure 42; Children with Down syndrom bathing an elephant	84
Figure 43; Ability class 6 child with Autism at Goodwill Special Needs Demonstration Academy making a bag out of beads.	85
Figure 45, Paintings displayed by Teens and Tots Special Neuro-development Center after World Autism Awareness Day match on 2nd of April 2024 Kati Kati Restaurant.	87

Figure 46; Doormat Crafts displayed by Silent Angels after the World Autism Awareness match on 2 nd April 2024 at Kati Kati Restaurant.	87
Figure 47; doormat and bead crafts made by Teens and Tots Special Neuro- development Center after the World Autism Awareness match on 2 nd April 2024 at Kati kati Restaurant	88
Figure 48; Sisal doormats displayed by Teens and Tots Special Neuro- development Centre after World Autism Awareness Day match on 2nd of April 2024 Kati Kati Restaurant.....	89
Figure 49; Kenyan Bags, jewelry pots, and table mats made out of Crochet made using acrylic threads. East African community Jua Kali Exhibition. Kololo Indolence Grounds.2022	89
Figure 50; Tanzanian Crochet baby shoes, sweaters, and costumes made by acrylic threads. East African community Jua kali Exhibition. Kololo independence grounds.2022.	90
Figure 51; Ugandan Crochet bags. East African community Jua kali Exhibition. Kololo independence grounds.2022.	90
Figure 52: Guided discovery	92
Figure 53; Class exercise for a child at Goodwill Special Needs Demonstration Academy.	93

Figure 54; Home work for a child.	94
Figure 55: Preliminary studies developed of bananas.	97
Figure 56: Development of distortion of bananas	98
Figure 57; Tools and materials used in the production of 3D crochet sculptures	99
Figure 58: 3D crochet sculptures of bananas.	100
Figure 59; Children with Autism at Goodwill Special Needs Demonstration Academy learning colors through the 3D Crochet sculptural bananas with various colors	106
Figure 60; Children with Autism at Goodwill Demonstration Academy feeling the texture of the 3D Crochet Sculpture	107
Figure 61; Crochet butterfly	108
Figure 62; Ever decreasing circles.....	109

LIST OF ABBREVIATIONS.

ABA	Applied Behavioral Analysis
ADHD	Attention Deficit Hyperactive Disorder
ASD	Autism Spectrum Disorder
CEDAW	Convention on the Elimination of all forms of Discrimination Against Women
GSNDA	Goodwill Special Needs Demonstration Academy
PBIS	Positive Behavioral Intervention Support
UNESCO	United Nations Education, Scientific and Cultural Organization
UPE	Universal Primary Education.
3D	Three-Dimensional
2D	Two-Dimensional

ABSTRACT

Children learn a lot through experimenting with learning aids, however, there are limited special colored 3D learning aids for children with Autism. Most of the learning aids available are colored 2D and don't take care of the children with autism and as such, children with Autism are left out. Whereas there are special schools for children with autism, in Uganda they are very few and not every parent has the capacity to take their children to such schools. This means that many children with Autism learn with other normal children. Most of the learning aids especially the colored 3D sculptures are meant for children without any disabilities. Children with Autism therefore fail to understand the available learning aids which don't capture their interest thus impeding their development. The objectives of the study were: to analytically identify the learning aids used to teach children with autism, to analyze the reaction of children with autism towards certain colors on the Spectrum, and to create colored three-dimensional (3D) Crochet Sculpture for representing various Autistic Colors of the Autism Spectrum. The study was qualitative and employed an ethnographic approach. The respondents included the head teacher, the teachers, Children with autism, and caretakers of Goodwill Special Needs Demonstration Academy in Kireka, Kampala who were purposively selected. Data was collected through interviews and observations on children with autism to find out their reactions towards the colors in the spectrum, their attention deficit, how they study in class and the environment, how they are treated, awareness of crocheting and their learning tools and needs among others. The findings revealed that colored 3D crochet sculptures significantly benefited children with autism by facilitating color learning and sensory exploration. The children responded positively to the tactile nature of the sculptures, which helped them express their sensory abilities through touch and feel. Additionally, sculptural puppetry emerged as an effective tool for incidental learning, demonstrating that play-based activities can enhance educational outcomes for these children. The study recommends integrating colored 3D crochet sculptures into the learning environment of children with autism so as to bridge the gap left by conventional learning aids.

CHAPTER ONE: INTRODUCTION

1.0: Overview

This study sought to create colored three-dimensional (3D) crochet sculptures as learning tools for Children with autism using Goodwill Special Needs Demonstration Academy as a case study. This was because most of the learning aids for children with Autistic challenges tend to use colors on two dimensional (2D) surfaces. The research was informed by an interpretive theory which required an explanation. This chapter presents the background of the study, a statement of the problem, the purpose of the study, research questions, objectives, significance of the study, the scope of the study, and the definitions of terms.

1.1: Background to the study

Autism is both a hereditary and environmental neurodevelopmental disorder. According to Alyami et al. (2022), autism spectrum disorder (ASD) is a childhood developmental disorder characterized by multiple social, behavioural, and communication difficulties. Individuals with ASD often find it challenging to relate with others and make friends easily. They may exhibit hyperactive tendencies, focusing on one thing for a few minutes before shifting to another. Alyami et al. (2022) also Source and Explanation that individuals with ASD tend to repeat certain behaviours and might resist changes in their daily routine. However, the characteristics of ASD can vary widely among individuals. Some people with ASD, particularly those with Attention Deficit

Hyperactive Disorder (ADHD) and Asperger's Syndrome, can quickly understand things in detail, which can be considered a unique strength. The autism spectrum includes a wide range of conditions, from those who are hyperactive to those who are hypoactive.

Martin (2011) categorizes ASD into several types, including Autistic Disorder, Asperger's Syndrome, Childhood Disintegrative Disorder, Rett's Disorder, and Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS). As an art therapist, Martin recommends expanding research into art therapies to meet the current needs and expectations of the autism community.

Autism Spectrum Disorder is not a disease but rather is a special and unique ability among the children that have it. According to Stone, (2004), for the autistic, autism is not a weed to be pulled out; on the contrary, autism is something to be proud of. Generally, Children need to express themselves and to communicate with others. They fulfill these needs most effectively through personal expression, creative exploration and action. The visual and performing arts provide concrete experience in which children may encounter and interact with the world in ways that are unique and special to them.

According to the existing autism spectrum disorder (ASD) research in Africa by Wannenburg and Van (2018), early diagnosis (before the age of three years), as well as interventions, are very crucial in trying to hinder the progress of its development positively. Wannenburg and Van (2018) argue that early intervention increases the possibility of quickening conscious intellectual activities, like the Construction of individual, Long-term and short-term memory, and Visualization of things among others.

According to Wamala, (2017), Uganda does not have enough professionals to diagnose children earlier before three years which delays the placement process or misplacement of children with ASD. She cites an Autism Specialist Sembatya, (2014), who says that communities such as those in Uganda with very few people with knowledge about autism are left with no choice but to rely on traditional or non-evidence-based approaches to define, diagnose and manage it. Sembatya, observed that autism is an innovation in the education of children with disabilities in Uganda and reported that he devoted his time to raising awareness of autism in the East African region, where very little is known about the autism spectrum disorder. Neurodevelopmental disorders are recognized to be relatively common in developing countries but little data exist for planning effective prevention and intervention strategies. (Kakooza-Mwesige, Ssebyala, et al. 2014). They developed a 23-question screener and included the ten questions and additional questions of the autism spectrum disorder behaviors. Kakooza-Mwesige, Ssebyala, et al. (2014) recommend that autism spectrum disorders and related behavioral disorders be included in studies of neurodevelopmental disorders in low-resource and Explanation settings to obtain essential data for planning local and global public health responses

Wamala 2017, argues that Autism in Uganda is affected by lack of existing fully fledged programs that train professionals working with this phenomenon thus there are limited Source and Explanations of information to be used by all children with autism. She continues to say that assessment is minimal leading to a demand for the development of programs that train personnel in autism education.

Wamala 2017, says that the analysis of Kyambogo University academic programs indicates that there is currently no specific program that focuses on ASD. Instead, trainers are only exposed to aspects of ASD as a component of special needs such as delayed language skills, movements, learning skills, epilepsy, unusual sleeping habits and eating habits among others.

The understanding and accommodation of students with ASD within the educational system present a significant challenge. (Kabunga , Namata, Okalo , Kigongo, & Shikanga, 2024)therefore the need for comprehensive approaches to support individuals with ASD becomes imperative. Education interventions have been a focal point, yet the experiences of individuals with autism suggest a disconnect between interventions and their actual needs (Wood & Happé, 2023). The findings of Kabunga , et al. 2024, reveal a scarcity of reSource and Explanations and expertise among teachers at autism facilities in central Uganda, hindering the development of an ideal learning environment for children with ASD

Kakooza-Mwesige, et al. 2022 advocate for community-based interventions, training initiatives, and inclusive policies to address these gaps, improving the quality and accessibility of autism services for underserved populations. Similarly, 3D crochet sculptures could be “innovative, culturally appropriate tools can help address gaps in available autism centres” like Goodwill Special Needs Demonstration Academy, Kireka home, Dorna Care Home , Tunaweza Children’s Centre, among others.

(Kakooza-Mwesige, Bakare , Gaddour, & Juneja, 2022). 3D crochet sculptures could serve as affordable, sensory-stimulating tools that foster engagement, fine motor skills, and emotional regulation.

Grogan (2006), says that UPE schools have reduced dropouts of boys and girls in schools. it has also reduced a number of uneducated people in Uganda. Grogan continues to say that it was introduced on the quantity and the quality of the children in Uganda. Similarly, using colorful 3D crochet sculpture as learning aids can help reduce dropout rates among children with autism by providing a tangible and appealing methods of learning. These aids can cater to the sensory needs of children with autism, making the learning environment more inclusive and conducive to their continued attendance and participation in school.

Although UPE schools have catered for normally developing children in Uganda, limited schools have catered for children with autism. According to Juuko and Kabonesa (2007), UPE was introduced in Uganda in January 1997, following a political commitment by President Museveni that the Government would meet the cost of primary education of four children per family. This commitment was soon extended to allow all people that wanted to access primary education to do so., Primary education as basic education should be accessed by everyone regardless of sex, race and ethnicity. Furthermore, Juuko and Kabonesa (2007), say that Accessibility to education calls for non - discrimination issues as operationalized by United Nations Education, Scientific and Cultural Organization (UNESCO) and in Convention on the Element of all forms of Discrimination Against Women (CEDAW). In some of the schools in Uganda that

practice inclusivity like Friends International Christian Academy (FICA), teachers face challenges in teaching children with ASD, hence leading to stigmatization among themselves. Despite of the fact that they have fidget toys that help in their sensory regulation, they are rubber and most of them get torn. The research believes that 3D Crocheted supertural aids are stronger and could solve the issue of tearing fidget tools. Children with ASD in inclusive schools are way much better in life style this is because they learn from their peers as well. Goodwill Special Needs Demonstration Academy is not an inclusive school. It has various clients like Cerebral Palsy, Intellectual impairment clients and children with ASD (Both Mild and Severe cases). They provide for them medication. And love them. For some intellectual impairments, it's hard to deal with however in the case of ASD, some autistic traits can be reduced through education, and any other therapy.

One of the most common treatments and interventions among Children with Autism are Applied Behavioral Analysis (ABA), Educational behavioral Support, Medications, Speech and language therapy, family support, occupational therapy, among others.

Applied Behavioral Analysis (ABA) focuses on necessary skills needed to talk, play and live like teaching toilet skills, break time behaviors, bed time routines games, academic behaviors and stopping negative behaviors. Education support improves a lot in a child with autism. Just like the way it improves and helps a normally developing child. There are various learning tools for autism like labels and printed/ written materials, videos, highlighted key content, graphs, charts, maps, graphic organizers among others.

Martin, (2009) argues that using art as an early intervention has many benefits for children with autism. For example, through art activities, children may express imagination and abstract thinking. In addition, Martin says that art intervention may improve a child's sensory regulation and integration. Art and design education provides an understanding of formal elements of composition. Patel and Patel, (2020) cite Hinz 2016 who argues that a variety of texture, color, smells and tastes of art have an inherent capacity to inhabit or induce emotional and sensory response in those with Autism. In other words, children with autism love feeling a texture of objects.



Figure 1; *Touch and feel*

Source and Explanation; The figure above shows students at Maharaja Sayajirao University of Baroda (MSU), Varahi, Museum of Department of Museology department, MSU Baroda. The photo was extracted from Patel and Patel (2020. p404). Patel and Patel say that the Department of Museology in the Faculty of Fine Arts of the Maharaja Sayajirao University of Baroda (MSU), Gujarat, India, has been collaborating with local organizations that work for especially abled and visually impaired children for a touch

and feel session where some children with autism that were interested to feel the sculptural art participated.

Patel and Patel (2020) argue that enabling children with autism spectrum disorder (ASD) to use nonverbal expressions and engage in art therapy can build confidence in these individuals. Relating this to the use of 3D crochet sculptures as learning aids, these tactile and visual tools can offer significant benefits to children with autism. The hands-on process of creating or interacting with 3D crochet sculptures can serve as a form of art therapy, providing a nonverbal outlet for self-expression and creativity. This can help children with ASD develop confidence as they accomplish tasks and see tangible results from their efforts. Furthermore, 3D crochet sculptures can be used to teach various concepts in a way that is engaging and accessible for children with different sensory and learning needs. By integrating these sculptures into educational settings, educators can create a supportive and inclusive environment that fosters learning and personal growth for children with autism.

According to Devine, (2014), colors are companions of Children with Autism. Furthermore, it says that amidst so many threatening things that bombard them daily, their colors provide a point of contact.

According to Pulliam (2012), the definition of color underwent its most its most several centuries earlier as the result of investigations in hard sciences. Pulliam refers to one of the scientists that provided a revolutionary and essential definition of color. Pulliam says that newtons definition of color still dominates to date and it is evident in the Oxford

Dictionary which defines color as the quality or attribute in virtue which objects present different appearance in color (Pulliam, 2012). Children with autism have particular colors that they are attached too since color is dynamic in nature. Al Maqbool (2020), says that color preferences affect their preferences and mood. He continues to say that color perceptions are important factor in the educational environment of children with Autism. Al Maqbool further says that each color has its own features and is perceived differently from the other.

Mabonga (2021) observes that teachers involve learners in creative activities such as developing models of artifacts specific to the taught subjects because thematic teaching emphasizes the use of local environment, resulting in a favorable learning environment in the classroom. The researcher believes that creative classrooms enables children experience, explore, and have fun. The Competence-based curriculum emphasizes on creating a positive learning environment where students incidentally learn as teachers facilitate them. It also emphasizes on teachers having a tight relationship with a child to ease the child's learning including children with Autism as a well. Further more, Mabonga (2021) says that majority of teachers work in a constraining atmosphere insufficient learning aids, chalk being the only instruction material that they guaranteed on a regular basis.

Westland et al., (2021) cites a contemporary artist painter Wong who argued that because tastes change from generation to generation and according to an individual's sex, age, race, education, cultural background, e.tc. it might be difficult to establish specific rules for creating effective color combinations. Westland et al argue that Color is dependent

on color preferences within group of people. It seems that there are no universal laws of color harmony; rather ideas about color harmony shift over time and between cultures and are application specific. Just like anyone else, children with autism have preferences which can be influenced by individual experiences and sensory processing differences

Stimulative colors give children with autism discomfort hence hindering the achievement of these children.



Figure 2; *Itten's subtractive color wheel.*

Source and Explanation; The image above shows the subtractive and stimulative colors that are chronologically neutral. These colors provide a comfortable learning environment to children with autism and make education much more effective with a comfortable environment that is favorable for them to learn. It was extracted from *Westland et al. (2021)*

1.2: Statement of the problem

Although Children learn a lot through experimenting with learning aids, there are limited special learning aids for children with Autism especially colored 3D Learning aids. Most of the learning aids available are colored 2D which don't take care of the children with autism and as such, children with Autism are left out. Whereas there are special schools for children with autism in Uganda, they are every few and not every parent has the capacity to take their children to such schools. This means that many children with autism learn with other normal children. In addition most of the learning aids especially the colored 3D is best understood by children without any disabilities which disadvantages children with autism. Even in a few special schools for Autism children, there are few colored 3D learning aids that sufficiently address the needs of autistic children. This hinders their development hence the need to develop colored 3D learning aids to capture the interest of children with autism.

1.3: Purpose of the study

The purpose of the study is to create colored three-dimensional (3D) crochet sculptures as learning aids for Children with Autism.

1.4: Objectives of the Study

1. To analytically identify the learning aids used to teach children with autism.
2. To analyze the reaction of children with autism of towards Certain Colors on the Spectrum.

3. To create colored three-dimensional (3D) Crochet Sculpture for representing Various Autistic Colors of the Autism Spectrum

1.5: Research Questions

1. What are the learning aids used to teach Children with autism?
2. How do Children with autism react toward Certain Colors on the Spectrum?
3. How can one create colored three-dimensional (3D) Crochet Sculpture representing Various Autistic Colors in the Autism Spectrum?

1.6: Significance of the project

Although the use of sculpture has been shown to support learning among children with low disabilities there is no evidence of the benefits of sculpture to support communication and learning for Children with Autism.

The outcome of the Study contributes to academic research, particularly in understanding and supporting autism. Researcher focusing on sensory integration, cognitive development, and therapeutic interventions for autistic individuals found valuable insights by exploring the tactile and visual stimulation provided by 3D crochet sculptures, the researcher can better comprehend how such stimuli impact the sensory processing and engagement of children with autism. This study can pave the way for further investigations into non-traditional educational aids, broadening the scope of research and potentially leading to the development of innovative procedures and materials that enhance learning and therapeutic outcomes.

The effect of the Study remains helpful to communities Special Needs education in easing teaching of the children with autism. It captures their interests which leads to their incidental learning.

1.7: The Scope of the study

The study included the Geographical scope, Content scope, and time scope

1.7.1: Geographical Scope.

The Study was conducted at Goodwill Special Needs Demonstration Academy (GSNDA). Goodwill Special Needs Demonstration Academy (GSNDA) is located in Kampala, Uganda, in the Central Region, Kireka Ward Zone B LC1 near Kabaka's Palace in Kira Municipal Council, Wakiso District.

1.7.2: Content scope.

The content scope was based on the three objectives of the study.

In the first object, different learning aids for children with autism were analyzed. The analysis was bas in the tools and materials used by various teachers, specialists, and artists to produce learning aids for children with autism.

In the second objective, the researcher analyzed the reaction of children with autism towards the various colors on the spectrum.

Definitions of Terms.

Applied Behavioral Analysis (ABA) is a type of interventional therapy in which a child with autism works with specialists one on one to improve social skills.

Autism Spectrum Disorder (ASD): This is a hereditary neurodevelopmental disorder that comes with intellectual impairments in the brain, and other diseases like epilepsy.

Colors: is simply hue

Competence based curriculum: is the curriculum that focusses on what learners are expected to know.

Contemporary art Sculpture: These are sculpture art that involves the transition of technology and cultural diversity. In other words, exploration of unusual art ideologies and materials.

Conventional materials: These are materials used based on what has been used in ancient times and traditional customs to make artworks for instance Stones, Clay, fiber, Yarn, and animal skin among others

Crochet: This is a manipulation of yarn to make a series of loops using either a machine or a hook.

Crochet Sculpture: A three-dimensional or two-dimensional art with voids that are made by manipulating yarn to make a series of loops using either a machine or a hook.

Learning: is a process of obtaining skills through study, experience, or intervention from the society.

Learning aids: are materials and tools used for intervention and interaction. They could be theoretical, physical and digital.

Learning environment: is a space that is favorable for learning to take place

Non-Conventional Materials: Materials that are not conforming to customs, tradition, and usual practice but are unique materials like Plastics, Polythene, and Plaster of Paris, among others.

Occupational therapy; is a process of obtaining skills, that are help in flexibility of an autistic patient with activities like washing utensil, farming, that can be applied at school, work and home.

Spectrum can be described as range of visible colors or a rainbow of colors. However, it can also be described as a range of conditions this case to autism. There are various disorders on the autism spectrum like Asperger, down syndrome, attention deficit hyperactive disorder among others.

Studio Space: A space used by an artist to discourse and come up with ideas for art creations.

CHAPTER TWO: LITERATURE REVIEW

2.1: Introduction

This chapter discusses the existing literature related to the study three-dimensional (3D) Crochet sculpture as learning aid for children with Autism; A case of Goodwill Special Needs Demonstration Academy basing on the objectives of the study which sought to analytiically identify the learning aids used to teach children with autism, to analyze the reaction of children with autism toward Certain Colors on the Spectrum and to create three-dimensional 3D Crochet representing Various Autistic Colors of the Autism Spectrum. a number of arguments advanced by various scholars are reviewed. Before preceding to the literature review, the theoretical framework in which the study was grounded is presented.

2.2: Theoretical Frame Work.

Weber, 1922 advocates for an interpretive sociology, which emphasizes understanding the meanings and motivations behind social behavior. Weber's approach, often called Verstehen, involves a deep empathetic understanding of the subjective experiences of individuals.

Fulbrook (1978) discusses how Weberian sociology remains relevant and offers valuable insights for contemporary sociological debates and methodologies. Fulbrook highlights the enduring utility of Weber's interpretive methods in analyzing and understanding complex social phenomena.

Linking this to the researcher's study on interpreting autistic sentiments towards 3D three-dimensional (3D) crochet sculpture as a learning aid, Weber's interpretive sociology provides a framework for understanding the subjective experiences of autistic individuals. By using observation and empathetic understanding, the researcher gained insights into how children with autism perceive and interact with 3D crochet sculptures, thereby uncovering the meanings and significance these objects hold for them. This approach can reveal how these learning aids might impact their learning processes and emotional well-being.

2.3 Autism learning aids

Interventional treatments for children with autism often include educational support, employing various methods such as written materials like charts, visual aid posters, and pictures (Smith, 2019). While researchers believe these treatments can be beneficial, they are not considered cures for ASD but can help mitigate some autistic traits (Jones, 2020). Despite these interventions, meltdowns can still occur, and in some cases, medication may be necessary depending on the severity and type of meltdown experienced (Brown, 2018).

The other interventional treatment is Applied Behavioral Analysis (ABA). This involves daily activities and behaviors, i.e. dealing with negative behaviors or social emotional difficulties and sensory issues. Stone (2004), says If your child has discovered fire and plays with it dangerously, become involved with his intoxication until he can hear you and understand the concept of danger. This involves a lot of patience and love. Stone has met only two children who held such enchantments. The older child was 22 years old and

started a small fire inside the ashtray. As stone walked into her living room and she found him hiding under the cushions at the same time watching the little fire with amazement and intoxication. Stone told him that it was dangerous whilst removing the fire the 22-year-old child said; "Why are you taking it away?" It is beautiful to watch. I can take care of it ". she explained that if he wanted to have fun with fire, he would have to do it in a guarded environment and that having a fire on a wooden table inside the living room is not safe. The interest of these two children was colors of the fire flame.

The 22-year-old child then asked Stone why. She continued explaining that the ashtray was made of glass and that glass could crack when heated. If the ashtray cracked, he could panic and if he panicked, he might not know what to do. Fire could kill us as well as burn the house down. The 22-year-old child thanked Stone for the explanation and promised not to start a fire again. He also apologized for starting this game.

Stone says you might think that her explanations were too obvious. Three years ago she would have agreed with you. However, after three years of sheltering various autistic friends, she learned from them about the need to be guided through the entire chain of causes and effects. The length of such chains differs from person to person and is unique to your child. You can only explain and/or share reasoning through teaching cause and effect to a person who is willing to listen. Explaining is not the same as 'telling off' which still requires a lot patience and love. In the Ugandan setting we were told off and the next thing we knew is a stick that only builds fear, anxiety, stress which only make things worse for the child hence increasing negative behaviors.

Another treatment is therapy. In Stone's book, she explains that where therapy starts at 10 and finishes at 11, your child might find himself confused over why he has to leave when he is enjoying himself and just began learning something new. Either way, the child is missing out on opportunities to expand his knowledge. Another factor to consider when assessing the benefits of any therapeutic intervention is the length of that child's shared attention. Stone continues to explain that successful teaching occurs when the teacher uses his pupil's attention. The teacher shares knowledge and his attention is directed toward making sure that the student understands the meaning of what he is teaching. The student's attention is naturally directed towards acquiring that knowledge and asking questions when in doubt. The process of teaching-learning happens during such shared attention periods. Furthermore, Stone shared attention is an act of will during which our learning occurs naturally. We recognize it as curiosity. I have never heard of anyone who could enforce curiosity upon a child by restraining behavior or confining him within a teaching environment. This is why the interaction room is always open and the volunteer friend follows the child's agenda. When the child leaves the room his friend leaves with him (if invited) or waits for the child to return. Whoever enters the interaction room (parent, therapist, or volunteer helper) carries the intention of sharing and building a relationship based on friendship. When we follow the child's agenda, we are working with the child's interests, curiosity, and attention. Autism as a vague entity is of no relevance in this context. The interaction play friend joins in with the autistic play because the child's attention is focused on something. The friend's job is to translate that something into words and encourage the child to repeat those words. Stone says that the

greatest hurdles experienced by therapists working against autism are deviating a child's attention by directing his attention towards an activity introduced by the therapist especially if that activity makes no sense to the child. In comparison, because the friend is constantly observing the child, he notices those natural shared attention moments, acknowledges them, and chooses activities that will increase the duration of shared attention. Every child connects with you, even if for one second!

By the time these children used Stones' home as a shelter, they were tired of being told off. They wanted explanations and they wanted friendship. The other child who liked fire was nine years old. Terrified that their child could set the house ablaze, the parents locked every room and kept the matches and lighters well hidden. However, just like Alexander who was able to find a pen to draw on the walls, this child found lighters and matches. In Stone's living room, she turned on the gas log fire and they sat by it together. Stone wanted to teach him the link between fire and danger. "I wish you could picture his beautiful face excited to sit by the fire." Stone, continues to explain that as they sat next to each other he pointed at the flames, smiled, and then looking at her said, "See castle "meaning" (Candle) or log fire.

The body language associated with curiosity is the same in both children with autism and children without. (Stone. 2004)

According to the existing ASD research in Africa by Wannenburg and Van (2018), Early diagnosis (before the age of three years), as well as interventions, are very crucial in trying to hinder the progress of developmental delays. Wannenburg et al (2018)

continue to say early intervention increases the possibility of quickening conscious intellectual activities, like the Construction of individual, Long-term and short-term memory, and Visualization of things among others.

However, "in African countries diagnosis of ASD is frequently and entirely made when children reach school going age, if at all. 6, 11, 17. Wannenburg and Van (2018) further explain that the delay in screening and diagnosis has been attributed. They stated some of the factors that lead to the delay of Screening and Diagnosis include, but are unrestricted to, incomprehension of ASD among communities, caregivers, and professionals in the health and education sectors.

Wannenburg and Van (2018) say the financial expense of diagnostic procedures and a lack of culturally appropriate screening measures are also attributing factors. The stigma directed at individuals displaying behaviors or symptoms related to ASD and their families may deter caregivers from seeking help (Wannenburg & Van, 2018). There is also a belief and associated stigma that symptoms of non - communicable diseases and ASD, in particular, are caused by supernatural forces. This often results in caregivers' primary health contact being a spiritual or traditional healer instead of a health professional that may be in a position to make a diagnosis. This is due to lack of awareness in the society. Wannenburg and Van (2018) argue that late diagnosis may be related to the high incidence of non-verbal autism in Africa. this places a greater psychosocial and economic burden on families and communities of individuals with severe autism who are unable to be autonomous or contribute to the workforce.

Methods to being allowed to attend the local country school. When Grandin's parents enrolled her in a mainstream high school, she struggled both academically and socially. she was teased for her peculiar way of walking, her mannerisms, and her inability to speak normally. As a result, she got involved in fights and was expelled from school. She then enrolled in a small farm high school with other children who had various disorders. Two of Grandin's teachers and her aunt mentored her during this time. As Grandin had begun to regress, their patience as well as creative ways of interacting with her facilitated a turning point in her development. According to Grandin animals and art enabled her to cope from an early age. Her science teacher witnessed the value of her ease around animals and fascination with inventions. He encouraged her to focus on her fascination and pursue a career in animal science. Despite the severity of Grandin's case, she developed cognitively and psychosocially to the extent that as an adult she lives an autonomous and productive life as an animal scientist and autism activist. Grandin's development was facilitated by interventions. However, they have not established ASD interventions at times required creative adaptation from members of her family and community. These interventions and their possible adaptation for ASD in African countries will structure the focus of this research.

2.4 Autism and Colors

According to Al Maqbool (2020), color perception is very important in the educational environment of children with autism. Al Maqbool continues to say that each color has its own features and is perceived differently from the other.



Figure 3; *Color perception in children with autism in a Sensory room that is used in Educational Centers.*

Source and Explanation; The figure above shows the color perception in Children with Autism through a sensory room. We see a young boy touching the colors blue and red while looking at them. *It was extracted from Al Maqbool (2020)*

Al Maqbool (2020) also says that the use of colors in learning environment is specific spaces and spatial requirements should be considered and more attention to color choices for each space such as spatial sequencing in class rooms.

According Gage (1999), to most of us color has seemed to speak to most of us and ambiguously.

Color by definition refers to a property consumed by an object by producing various sensations on the eye as result of the way it reflects or emits light in this case, to the person with autism. Newton (1952) defines light as a radiation in form of electromagnetic waves. Children with autism have particular colors that they are attached too since color is dynamic in nature.

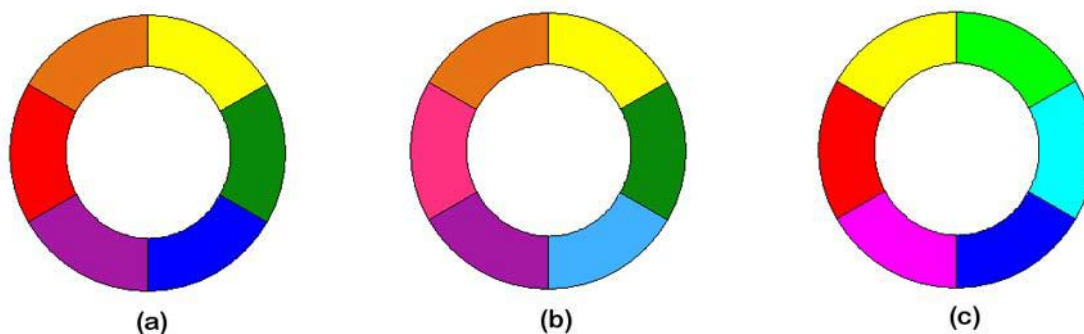


Figure 4; *Diagram of the Pigment color wheel, process color wheel and the light color wheel*

Source and Explanation; Photo by Hassis extracted from Westland et al, (2021).

Westland et al, it shows both primary colors and secondary colors which were produced by Hassis as seen on the color spectrum wheel cites one as seen in the figure above

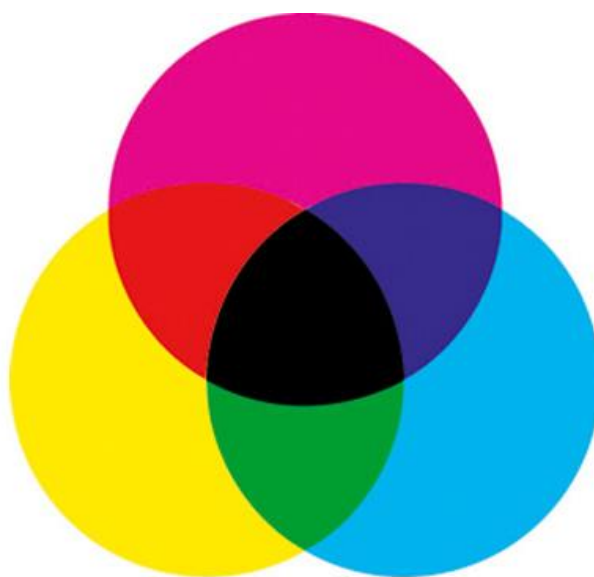


Figure 5; *Color wheel based on subtractive color mixing*

Source and Explanation; Photo by hariss and extracted from Westland et al. (2021)

Specifically, children with autism are comfortable with chronologically neutral colors. In other words, colors that are deemed or colors mixed with grey which will be shown in figure 3 made by itten (*Itten's subtractive color wheel.*)

When it comes to understanding the meanings of colors to children with autism, each child may have unique experiences and perception towards certain colors. It can be helpful to engage in open and non-judgmental conversations to understand how specific colors make them feel. Feather, one of Stones' many adult autistic friends opened her heart and wrote: For the autistic, autism is not a weed to be pulled out; on the contrary, autism is something to be proud of. (Stone, 2004 p.12).

Feather compares the non-Autistic and Autistic with the prism and colors of the rainbow. She explains using the white light and the seven colors of the rainbow. She said that it occurred to her that just as white light is the essence of all colors, so autism is the essence of the autistic person. Furthermore, Stone, 2004 p12 says to divulge the beauty of the rainbow one needs a prism. Stone, (2004 p13) continues to say when the prism splashes light on the seven colors, "the light itself" is "an effect of the eighth color - the invisible color, something to be proud of, and something to be valued separately in its own right. In this case, it is very crucial to involve the children with autism and the autism specialists with the process to gain a better understanding of the personal experiences and associations with colors. Feather Stone, p.13 continues to say non - autistics can become a firmly fixed prism of trust for autistic people and allow them to show us their beauty. We need to find within ourselves the patience to observe and understand what we have in common, not what partitions us. (Stone., 2004). in the educational system of children. Just like Newton (1952) courted "Bodies act upon light at a distance."

According to Devine (2014), long before children learn language, they may have learnt to use color labels to bring order to chaos – decode the world. Devine argues that we

must be careful when we use colors in order not to confuse or contradict with what the child with Autism already knows. Devine says that we must take care how we introduce colors to the child with autism. Children may take steps back when you present colors that are contradicting. Furthermore, Devine says that when teaching children with autism it is visual that we build trust and they are confident in our ability as teachers. Devine argues that they must be able to look to us for right answers. Devine courted “they know their colors. but do we? Devine says that there are so many ways of exploring colors beyond worksheets. Like painting explorations boxes and applying random color, adding food scents as well. Devine emphasize that if you contradict with these children, you confuse them the more. she gave an example of lemon and yellow pepper. Devine says that learners with autism are well known for their attention to detail. Devine continue to say that they relentlessly pursue the truth.

Devine cites two researchers who spent several years studying how children learn language, particularly colors, melody Dye and Micheal Ramscar, who conducted a series of color recognition tests for two-year-old children and they failed to label the colors correctly. The researchers discovered that the reason was because of hues.

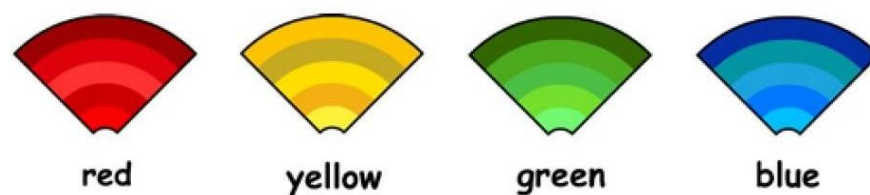


Figure 6; Hues of red, yellow, green, and blue

Source and Explanation; The figure above shows hue of red ,yellow, green and blue from light to dark. It was extracted from Devine (2014).

Devine argues that the we use colors is not universal and consistent. Devine also cites out Joseph Albers a specialist, who says that if one says red (a color name), and there are 50 people listening it can be expected that there will be 50 reds in their minds. And one can be sure that these reds will be very difficult colors. However, Devine says that some children connect with colors before symbols. Devine cites Tammet (2007), a patient who was diagnosed with Asperger. Devine says that Tammet's unique mind enables him learn a new language within a week and solve the most complex mathematical equation in his head. He recalls in his memory born on a blue day the early obsession he had with Mr. Men books. Tammet spent hours in the evenings lying on the floor with his books in his hands looking at shapes and illustration which made him feel happy and peaceful. Reading the memoirs, Devine says that he found what he believed is a common thread running through each individual story of the love affairs with colors.

Devine cites Pitchford and Mullen 2002, who researched about why it was difficult for toddlers to learn color water and the found out that they saw the use of colors but perplexed with the color words. Devine says, Children with Autism may know their colors and be able to use them but translating them to language take longer. Furthermore, Devine says Color coding helps the children to know that various symbols have various uses. In other word various colors have various meanings.

Devine continues to say that when working with pre verbal children it is inevitable. Devine cites out Gray who suggests that color may be incorporable to suggest thoughts and emotional content statements.

Colour for writing	Malachy (7)	Donovan (5)
Bad ideas, anger, unfriendly.	Red	Dark Grey
Sad or uncomfortable	Blue	Yellow
Proud	Gold	Blue
Frightened	Dark Brown	Red
Facts and truth	Green	Green
Comfortable & cosy	Yellow	Golden
Questions	Turquoise	Silver
Confusion	Pink	Orange

Figure 7; How children link different colors to feelings

Source and Explanation; This figure above shows the color for writing of Malachy and Donovan and their perspectives. It also shows that each child's perspective differs except green that meant facts and truth. It was extracted from Devine (2014)

According to Devine (2014), this was reflected on the experience that Malachy and Donovan had during a summer trip with family. Children were let to assign colors to different feelings that the felt then. The color the child chose for people's speech shows how he perceived that person's emotions Devine says that this can Alert us to misperceptions of other people's emotions prompt a discussion. In other wards various people have various color preferences.

Devine ask a question how early can a child make color connection? His son at three years announced that his favorite color is red and one year they were walking back from preschool he announced blue as his favorite color. For a moment Devine's heart sunk. Devine wondered whether he was following the crowd. According to Caroline (2020) with children with autism, a 12-year-old could behave like a 3 to 4-year-old. Devine says that children with autism are comfortable and secure with their colors. Devine continues to say that they spent as much time as they can with them. Devine believes that children with autism don't just like colors, they love them intensely. Their relationship with colors is personal. They may find a new love, but the colors retain a hold on their hearts as do all first loves (Devine 2014). Devine cites Kristintine Barnett, author of *The Spark . A Mother's Story of Nurturing Genius*, whose two and a half child Jake created a beautiful rainbow on the floor using their a multitude of colored crayons. . she was shocked to realise that they were in the correct order of the spectrum. She remembers the conversation she had the next morning at breakfast with her husband. How can he possibly know the order of the color spectrum? Barnett asked. Micheal said Jake reached out to the table and turned the faceted water glass in front of Micheal so it caught the morning sunshine pouring in from the sliding door, splashing a gorgeous, full spectrum rainbow across the kitchen floor. I guess that's how he knows. (Barnett 201. p42)

Shortly after Jake turned four, Barnett reflects on how he had “ become interested in examining light and colors chemically. He found observing colorful signatures of gases as profoundly moving and emotionally intense as an architecture buff seeing the cathedral at Chartres, or lover of impressionist art left alone in a room lined with Monet's water lilies’

(Barnett, 2013) just like Isaac Newton who to an extreme mile in finding out about color and light. In his book Optick. According to Barnett (2013) Isaac Newton was human-centrally diagnosed with Autism. Barnett says that no one understood Isaac Newton's behavior until later in life. This was because her son did exactly what Isaac Newton had done with the prism and light. Sometimes we just have to let the timeline correct itself.

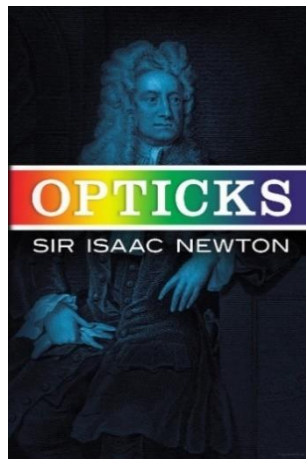


Figure 8; *A treatise of reflection, refractions, and color of light.*

Source and Explanation; Extract from the book of Newton (1952). This book talks about the connection of color and science.

The puzzle is one of symbols of Autism there are various symbols mentioned in the paper of Weaver 2017. Jigsaw ribbon, umbrella, and the rainbow with three colors. And it has various colors. One of the colors is blue. According to (Weaver, 2017) the umbrella used for this paper is one consisting red, yellow, blue and green. Red does not show any support but rather represents the various Disorders on the spectrum. Weaver 2017 says that the meaning of green, applied towards the end of the twentieth and twenty first century includes; health, hygiene, nature, energy, revitalization, restoration and renewal and leisure time activities. However, the predominantly health and the health meanings

are certainly worth nothing. (Weaver, 2017). In other words, the real meanings of these colors on the umbrella are unclear. Various scholars and documents on blog have shared their different views about what the meanings of these colors on the umbrella. Weaver says that it is “health is not even represented in the umbrella given there are several other connotations associated with the color green. The hue of green used in the umbrella is a much less saturated one. (Weaver, 2017). The umbrella used in the paper of Weaver 2017 adopted an impersonal approach to representing autism including disorders. In clinics children are given green cards and red cards red to mean admitted and the green to mean “go home” however, in this case autism is a scenario where one needs to admitting to hospital. Some also use blue. It’s also not a guaranty that cards are supposed to be served. (Weaver, 2017) says that the red meaning that would be used we be that of the new beginning and new life. Furthermore, Weaver continues saying with this meaning, the birth of persons who may subsequently be given an autism or autism related label is celebrated as a joyous event and where the humanity of such persons is recognized and not as an event where humanity of the affected person is questioned as has often been the autism symbols a case with the puzzling metaphor of the puzzle piece. This would also celebrate the birth of such persons as unique and new examples of humanity as well (Weaver, 2017). The particularly intriguing meaning of transformation assigned to golden yellow would also be an empowering one if it were specified that the symbolic subject of such transformation was mainstream society (Weaver, 2017). In having main stream society as the object of transformation by becoming informed and accepting of persons affected by autism, such persons are no longer the ones being symbolized as

needing to be fixed and subsequently reach mainstream society standards. (Weaver, 2017)



Figure 9; *Symbol of the Autism puzzle umbrella. (Weaver, 2017)*

Source and Explanation; *The figure above depicts the autism puzzles with the colors blue, red, green, and yellow. It was extracted from the web*

2.5 3D crochet sculpting

Polley, (2014) explores the historical and contemporary link between knitting, the Olympics, and Culture. He cited quite several people that greatly contributed to and influenced the Crochet industry at large. Shauna, R the crochet demist is one of the artists that were cites by Polley to have made a massive piece of crochet consisting of three

polystyrene lions on steel frames, each approximately 5 meters (16 feet) long, which she covered with crochet made from Peak District. Shauna, R made use of local wool which was "solid" enough for the nature of her work and this was recommended by her commissioners (Polley,2014). The lion heart project was not vying art in the sense of the artist attempting to win a medal but rather, it was part of the competitive process of bidding for commissions that characterizes so much arts funding (Polley,2014). In Richardson's Lionheart Project, we can find some faint echoes of Ann Nicklin and Susan Speaks knitting needles (Polley, 2014). The Lionheart project was an official response to the Olympic Games in 2012 (Polley, 2014). It attracted significant media attention which gave recognition to many unofficial knitting projects. Knitting thereon became one of how people engaged with the Olympics in a humorous and homespun manner, and it became part of the much-vaunted voluntary culture of Landon 2012 (Polley,2014). He continues to say the results were very astounding and very many publications were done in knitting. Jil, (2014) believes the project opened up unexpected patches to imagining and being in the world. There is more than just creating gametes and crafts Jil., encourages Artists to look at art the binaries like Fine art and crafts, Utilities and Decorations, Animate and Inanimate, Figurative and Abstract, Science, and Arts and explode them.



Figure 10; *The Lionheart project.*

Source and Explanation; Photo by Nick Hand\Shauna Richardson extracted from Polley (2014).



Figure 11; *Standing stone art piece*

Source and Explanation; the image above depicts a Standing stone art piece. It was constructed by by Judy Taddman. Judy Taddman is one of the contemporary artists that enthused the researcher to do crochet sculpture. the material used was sisal. The image was extracted from www.gbu-presnenskji.ru

McSorley (2018) believes that fiber art contributes to claims of Stress and promotes it as a hobby of frequent practice for those who have discovered it.

Week three McSorley focused on how to crochet in a circle, as previous work had been done back and forth in rectangular shapes. The " magic loop " technique was selected for its superior appearance and versatility and "everyone's attention was focused on the work at hand" (McSorley, 2018). After the first round of the circles had been created, instruction was provided on how to expand to create a flat circle and how to add enthusiasm and new colors of yarn. Examples of crocheted mandalas were shown (McSorley, 2018 p.23-24).

McSorley, (2018) "Comparatively, shaping techniques in knitting required planning". McSorley, exploded the binaries of Arts and Science. His work was more therapeutic and was used to "reduce Stress among Care providers. McSorley's work also gives room to contemporary and visual artists to think and explore more about what crochet can do.

According to Udeani, (2014) Crochet or "Textile sculpture is a medium of expression with fiber, thread, objects through which sculptural forms are achieved by weaving and other creative processes." like Crocheting. Udeani continues to say that the interesting part of what is referred to as textile sculpture" or Three-dimensional (3D) crochet sculpture" is the method of construction in three-dimensional forms and the kind of creativity that is required to bring it to full physical manifestation". Furthermore, Udeani says that the basic principles which apply to all other woven fabrics also apply to all other

art like Crochet Artworks. The basic principles include; "emphasis, balance, rhythm, and structuring which will eventually lead to an ultimately meaningful piece. However, In Sculpture, Voids have to be applied to make a more meaningful piece.

Below are images of the processes of taken to create the woven sculpture.



Figure 11; construction of an armature using willow for blazing.

Source and Explanation; This image shows the construction of an amateur using a willow for blazing to make the amateur firm. It was extracted from Bakare and Bako, (2016)



Figure 12; weaving construction of a sculpture using Raffia.

Source and Explanation; This image shows weaving edifice process of the intertwined sculpture. The interlacing creation involved cane and raffia were wound around structures of the armature. *It was extracted from Bakare and Bako., (2016).* Weaving is a method of interlacing threads however, there are non-interlacing technics of weaving like Crocheting.



Figure 13; *Weaven sculpture with accessories.*

Source and Explanation; these images show an interlaced sculpture with accessories extracted from *Bakare and Bako., (2016)*. Bakare and Bako say that those basic rules that are needed to follow for the manufacture of an armature" to fabricate (Crochet) "textile sculptural piece" include; Sketching, output of an armature using a willow for blazing, weaving fabrication of a sculptural woven piece. The researcher is more interested in the non-interlacing technique to fabricate a sculptural piece. Bakare and Bako's journal room for artists to explorer more in fabrication of woven sculptural pieces

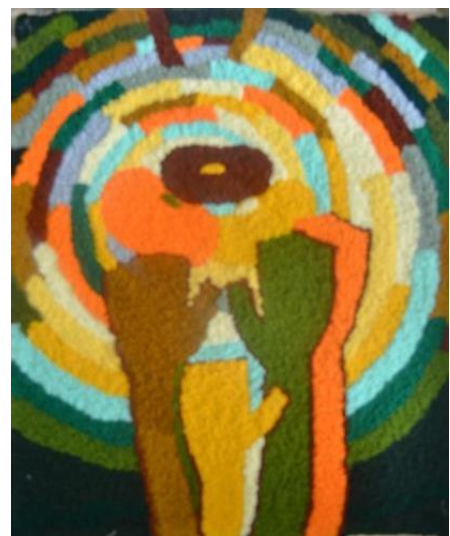
Niwatuhereza(2019, p.1)"Sought avenues to communicate indigenous cultural icons" of the "kiga in South Western Uganda" through the use of textile motifs.

Niwatuhereza, used Cotton yarn, acrylic yarn, and T-shirt offcuts during studio exploration to make the textile motifs. He aslo used Studio practice as a means of developing preliminary studies in form of drawings of Bakiga icons on the different

artifacts that were used as Source and Explanations of Inspiration to create designs and motifs for decorating textiles. Niwatuhereza, (2019) used studio practice to carry out experimentation of techniques of weaving and painting on different surfaces such as cloth and paper using different tools like brash and materials such as paint, threads, and water. He exploded the binaries of fine art and crafts to explore using cotton yarn, acrylic yarn, and T-shirt offcuts to make textile motifs. Below are some of the motifs extracted by Niwatuhereza E using acrylic threads.



Sharing (Niwatuhereza, 2019)



Delicious (Niwatuhereza, 2019)

Figure 14; *Motifs communicating the Kiga icons.*

Source and Explanation; According to Niwatuhereza in the figure 14 above where it shows motifs communicating the kiga icons, in one with delicious as the tittle, the hands represented rejoicing good harvest in the figure. His art encourages hard work. The shades of green presented the peaceful harvest, and the blue presented peaceful environment, royalty and integrity for elders. Grey represented maturity and protection.

And the other motif showing a composition of sharing communicates unity among the bakiga. It was costumed for family members to share a meal. (Niwatuhereza.,2019)

Niwatuhereza,s’ work increased awareness of the kiga culture, and also encouraged other artists in Uganda to explore acrylic threats and extract various contemporary art.

According to Handa, (2020), Nabukenya Ugandan artists used offcuts to create amazing and inspiring "multicolor installation artworks". Nabukenya's work is composed of "fabric offcuts stitched and knotted into a large canopy. with each knot and stitch signaling an exchange made with others involved in its making. Handa quotes Nabukenya who argues for shared labor and collective creations, her work brings the process of collaboration. She invites viewers to immerse themselves into her progressive path through collective creation by women whose activities extend from conversations as they stitch, knot, and weave waste textiles into visual contemporary art. (Nagawa.,2019).

The process of how the textiles return into the cycle alongside the stories is invigorating. (Nagawa.,2019). Nagawa, continues to say that they remind us that while much of contemporary life is steeped in wastefulness, Ugandans have always had ways of exploiting fabric offcuts for instance, creating fashionable outfits through patchwork using offcuts. Nagawa cites out one of the contemporary artists in Uganda Maria Naita who highlights families making clothes for their children with left-over fabrics in a patchwork method in Nabukenya's “Maama Yampa, Taata Yampa painting” As artists, Nabukenya's works open our eyes, to see that there is no boundary in contemporary life

and no limitations to what artists can experiment and explore by looking through all sides of the binaries including sculpture

Conclusion

This chapter was guided by the objectives; learning aids for children with autism, reaction towards colors on the spectrum, and creating three-dimensional (3D) crochet sculptures a learning aid. The literature reveals that art has been taught to these children and it plays a big role in the intervention of the children, texture sculptures are deep-rooted up-to-date

CHAPTER THREE: METHODOLOGY

3.0 Overview

This chapter comprises the research design, Area of Study, Sampling technique, Data Source and Explanation, methods of data collection, instruments of data collection, Ethical Considerations and designing process.

3.1 Research Design

The study employed a qualitative approach using an ethnographic design to explain and describe the findings and experiences on the 3D crochet sculptures as learning aids for children with autism while in the field. This involved going to the selected community at Goodwill Special Needs Demonstration Academy for a period of five months to carry out observations on children with autism, and find out their engagement with the environment including interviewing respondents on the learning aids used for teaching these children. In addition, the researcher also carried out observations on their reactions to colors of the spectrum. According to Blomberg and Burrell M., (2009), ethnographic research plays a big role in informing beyond the design of products i.e., understanding the depth, viewing and evaluating on the findings about research projects. This helped the researcher deeply understand the research learning aids for children with autism and also their interests and reactions towards the colors of the spectrum.

3.2 Area of Study.

The Study was conducted at Goodwill Special Needs Demonstration Academy in Kireka, Kampala because it is a school that handles pupils with Autism. However, the

school also has other children that are physically and mentally handicapped, but the study focused on those with autism. It also has a head teacher who is the administrator, teachers who teach the children, and the caretakers who take care of the children.

3.3 Sample size.

The researcher selected 8 respondents who participated in the study. These included the headteacher, 2 teachers, 2 caretakers, the chef, and 3 children with autism. The researcher considered this an appropriate number to collect relevant data for this study.

3.3 Sampling technique

The researcher used Purposive Sampling technique to select the sample size. This involved selecting individuals with the right knowledge, expertise and experience that is required for the study. She targeted the head teacher, the teachers, Children with autism, and caretakers of Goodwill Special Needs Demonstration Academy in Kireka to get information.

3.4 Data Collection

Two types of data that were collected during the study. These included primary and secondary data. While the data collection methods included interviews, observation, document review and photography as explained in the subsequent sections.

3.4.1 Primary data

3.4.1.1. Observation.

The primary data was obtained through observation by engaging with the community while observing the behaviors and interactions of children with autism in the field. The

observation was guided by the Behavioral Observation Scale (BOS). This helped in observing the social and emotional behaviors of the children with autism. According to Freeman et al. (1978), the Behavior Observation Scale (BOS) is used to code behaviors that are objectively defined and independent of any theoretical model of extreme development. The BOS was designed to be an easily learned and highly reliable instrument that can be applied to normal children as well as to those with developmental disabilities such as autism and mental retardation. (Freeman et al., 1978).

3.4.1.2 Interview

Another primary Source and Explanation was made through interviewing the staff in Goodwill Special Needs Demonstration Academy. The interview was carried out to get additional information about the learning tools, used at Goodwill Special Needs Demonstration Academy, and how sculpture is used as a learning aid for children with autism. This was conducted using an interview guide that had questions about how crochet is helpful to the children, how they react to certain colors of the spectrum and the role of art in the learning of children with autism.

3.4.1.3 Photography.

The researcher took photos using a smart phone camera to collect data and interpreted them using the narrative data analysis. Basalamah, et.al (2013) argue that photography is a dynamic element in the organization of an event, particularly as documentation because photos serve as pictographic evidence for the study. It also provides detailed data that might have been omitted during observations. The researcher requested her colleagues to

take photographs during her studio practice and chose important processes to document. She also captured moments that were valuable during her stay at Goodwill Special Needs Demonstration Academy.

3.4.2 Secondary data

Secondary data was collected through document review of various documentaries got from research papers, books, reports, peer reviewed journals archived from different data bases to provide background information about the study area.

3.4.3 Data collection Procedure

The initial process of data collection commenced by accessing the community of Goodwill Special Needs Demonstration Academy to create rapport with the respondents. This included seeking permission to carry out the research. Interviews were then conducted with the respondents at school with the help of an interview guide. Each interview lasted for a period of 40 minutes to one hour. Data was captured through field Source and Explanations, Source and Explanation taking, tape recording and photography.

This was followed by carrying out observations on the behaviors of children with autism, their reactions towards various colors of the spectrum, and the learning tools used to teach these children. The observation process was guided by a Behavioral observational scale.

3.4.5 Data Analysis

Data was analyzed using thematic content analysis using predetermined themes that were aligned to the objectives of the study. The process involved transcribing the audio recordings of interviews into text, organizing field Source and Explanations, transcripts, photographs and other collected materials from the field. This was followed by repeatedly reading through the text to familiarize with the data to identify the sub-themes under each predetermined theme and their relationship among categories of data. The findings were presented in descriptive and narrative format, photographs from the field, and direct quotations from respondents to show originality of the data.

3.5 Studio experimentation and development of sketches

The research was studio based therefore the researcher used studio experimentation to generate ideas. The researcher had to get Source and Explanation of inspiration from the environment. The researcher had two Source and Explanations of inspiration in mind. One was bananas, and the second was elephant. Bananas are found in the almost every environment or home area in the central region. One of the reasons is that it's food that satisfies hunger. The crocheted various sculptural prototypes of bananas with various colors in order to get a deep understanding on how these children are connected to the various color. Are they comfortable?, Are they not comfortable?

The researcher visited the zoo and came up with the idea of an elephant as a Source and Explanation of inspiration. Elephants are know to have a long time memory and have simillar character traits of individuals with ASD and are so attached to elephants. The

findings of Satiansukpong, Pongsaksri and Sasat 2017 show that elephants were used as therapeutic media and companions in doing activities with children with autism. Similarly, education and therapy are connected

The researcher used the various colours on the spectrum to understand deeply how they connected and how they can learn through these colors comfortably.

3.5.2 Lessons learnt during studio experimentation

During the experimentation of different materials used for sketching, sticking glue on paper made the paper and the threads hard. And somehow untidy. However, the advantage is that the beauty of the work did not perish.

Changing a Source and Explanation of inspiration took a lot of time. The advantage is that better ideas were created and guided by the supervisors.

3.5.3 Validity and Reliability

The validity was obtained through using various multiple data Source and Explanations such as observations, interviews, and document reviews. It was also obtained through using an independent researcher who interpreted the data and findings to check for accuracy through their feedbacks. In addition, it was also obtained through discussions of findings with the supervisors and peers to get their independent opinions and feedback regarding the study.

Reliability was obtained through following consistently the procedures for data collection, and keeping detailed records of data analysis processes (audit trail).

3.6 Ethical considerations

Following the approval of this research project, the researcher obtained an introductory letter from the Research Coordinator of Kyambogo University that granted her permission to enter the field of research, An informed consent was obtained from the respondents prior to the commencement of the study this was from the parents of the children that participated in the research and from the teachers as well. During the field, the researcher put it into consideration to respect all the Staff of Goodwill Special Needs Demonstration Academy and the children of Goodwill Special Needs Demonstration Academy as well. Participation was entirely voluntary and the participants had the right to withdraw from the study at any time if they wished without any penalty. The data was kept in a safe place and would only be accessed by the researcher and those directly involved in the research.

CHAPTER FOUR: DATA PRESENTATION INTERPRETATION AND ANALYSIS OF FINDINGS

4.0 Overview

This chapter covers the information collected from the case study area of Goodwill Special Needs Demonstration Academy following the purpose which is to explore the 3D crochet sculptures as learning aids for Children with autism using offcuts and acrylic yarn with various colors of The Autism Spectrum for Goodwill Special Needs Demonstration Academy (GSNDA) and the objectives of the study which are;

To analytiically identify the learning aids used to teach Children with autism in Uganda.

To analyze the reaction of Children with autism toward Certain Colors on the Spectrum

To create 3D Crochet Sculpture for Goodwill Special Needs Demonstration Academy (GSNDA) representing Various Autistic Colors of the Autism Spectrum.

Goodwill Special Needs Demonstration Academy is a private school under segregated setting that provides special teachers and special classes for children with intellectual impairments and other special needs ranging from the age of 6 to 18. They don't do P.L.E examinations due to intellectual impairments. However, those that have the ability to write are sent to other school. They are graded according to their ability. They have ability class 1,2,3,4,5 and 6. Ability class 1 ,2 and 3 are the severe children have no proper, toilet habits, can't help themselves, and have difficulty in writing, and doing various activities. Ability class 4,5, and 6 are the moderate children. That are able to bead work, table mats, and write with the support of care takers.

It is also a rehabilitation center for children. In case a child has got bad addictive habits, they help him or her get back on track. One of the respondents mentioned a scenario where a child was able to cope with community, but after getting an accident, the child went back to her old ways so they brought the child back. This is special case intervention. One of the respondents mentioned that other special interventions are scenarios where child's parent is not able to raise enough to provide, or children abandoned by their parents. Good will is funded by the community.

One of the respondents said that it was founded by the 4 Autism Specialists teachers from Kireka home in, one of them was Siima Sheilla Baitwabusa Annet who was the Director, the late Headteacher Mr. Sendagire Dan Kizza then, Osiru Partrick who is currently the headteacher, and Kabaganja Hafsa. They started with 5 students, she continued saying they used text books, charts, play cards, chalk, chalk boards. She said she had 2 teachers by them. She emphasized that the use of teachers is to make sure that he or she creates the learning aids

4.1 Autism learning aids

The researcher also observed that there were charts in the class room with drawings and names of the drawing of animals, religious leaders, teachers, dangerous objects, domestic animals, human activities done in the sub-county. These create a talking environment in the classroom.

Paint figure prints which were done during art lessons and placed on the walls of the class.

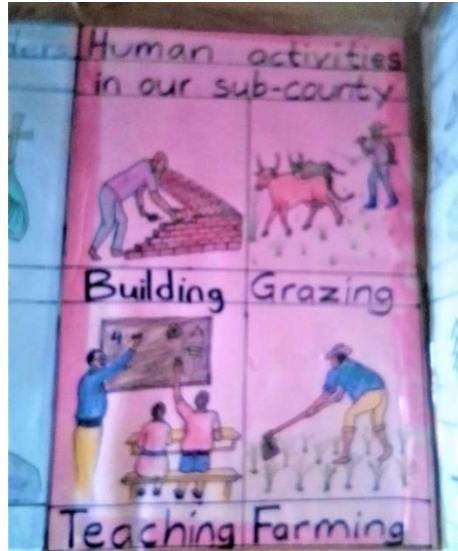


Figure 15; Chat in the classroom of Goodwill Special Needs Demonstration Academy
with human activities in our sub-county.

Source; Photo by the researcher. Extracted from a smart phone camera.

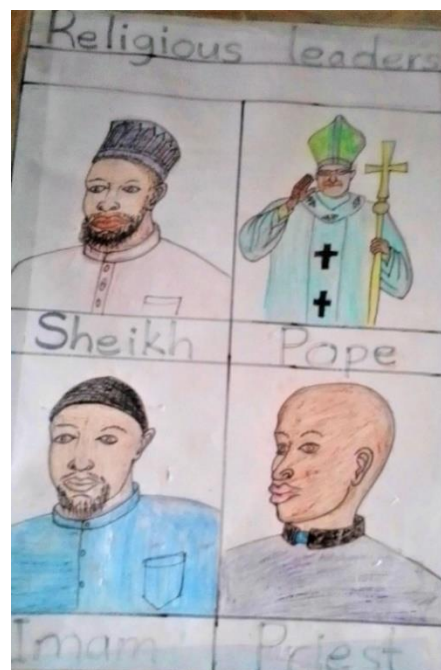


Figure 16; Chat in the classroom of Goodwill Special Needs Demonstration Academy
with religious leaders.

Source; Photo by the researcher. Extracted from a smart phone camera.



Figure 17; Chat in the classroom of Goodwill Special Needs Demonstration Academy
with domestic animals.

Source; Photo by the researcher. Extracted from a smart phone camera.



Figure 18; Chat in the classroom of Goodwill Special Needs Demonstration Academy
with dangerous objects

Source; Photo by the researcher. Extracted from a smart phone camera.

Pre vocational studies.

One of the respondents mentioned, Goodwill Special Needs Demonstration Academy conducts pre vocational studies that help children acquire skills that help them personally. Like crafting, agricultural skills, and others. This information was given by the respondents during the oral interview. One of the respondents said that pre vocational studies don't have any specific period of time unlike vocational studies where children learn within a given period of time. The researcher observed during the prevocational lessons, children played with beads while sorting specific colors that they were instructed to sort. This helped them understand specific colors and specific type of beads.



Figure 19; Various colours of Beads on a Backet Plate.

Source; Photo by the researcher. *Extracted from a smart phone camera*



Figure 20 ; *Sorted beads by children with autism at Goodwill Special Needs Demonstration Academy.*

Source; Photo by the researcher. Extracted from a smart phone camera

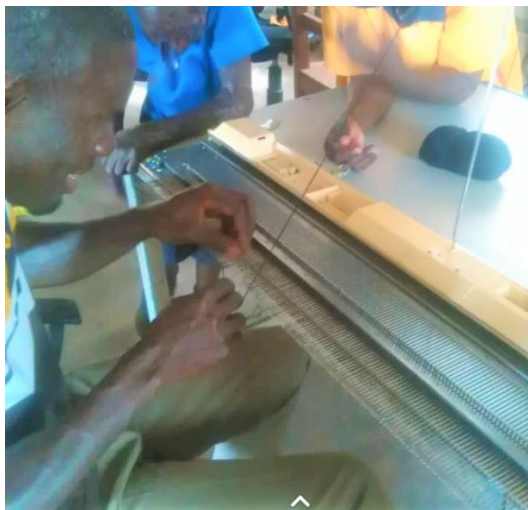


Figure 21; *Ability class 4 children at Goodwill Special Needs Demonstration Academy learning how to use a weaving machine.*

Source; Photo by the researcher. Extracted from a smart phone camera

Self-help skills.

The respondents pointed out that children with autism learn one thing at a time. One of the respondents gave an example. Before learning how to dress up they have to understand what they are going to wear in detail. Where the buttons are and where each button is supposed to be tied, what a tie looks like, what is a dress, shirt, a skirt and which gender puts on which clothes. The researcher observed that these were taught through various ways like creating aids like charts during her participation in creating them.



Figure 22; *Class room environment.*

Source; photo by the researcher. Extracted from a smart phone camera

The researcher also observed children wake up, lay their beds and go to the bath room to take a bath and have their teeth brushed. This was the same routine every morning.

A communication chart also helps out in teaching them social cues especially for those that struggle with social cues.

Other social skills like sweeping the compound and collecting rubbish from the compound, washing dishes after breakfast, and lunch time, and washing clothes with the supervision and help of care takers, laying beds. With these skills they are able to survive on their own.

The researcher observed one of the children, was sent to fetch water but then he was in a sweater and yet the sun was shining so bright. Then they told him to go remove the sweater. He left the jerrycan and went to remove the sweater and then after he got distracted by the children washing. He joined them and forgot about the jerrycan he was supposed to fetch. According to various stories of children with ADHD/ASD, their brain operates very rapidly, yet the body only does one thing at a time. One of the respondents said that sometime the brain tells them a timetable and because they have created the schedule, it's operated in the head and not the body but then the brain tells them that it's done.



Figure 23; *Children at Goodwill Special Needs Demonstration Academy washing clothes with guide of caretakers.*

Source; *Photo by the researcher. Extracted from a smart phone camera*



Figure 24; *Children at Goodwill Special Needs Demonstration Academy cleaning the compound with the guide of teachers*

Source and Explanation; these images were extracted from a smart phone camera by the research. They show children collecting rubbish from the compound to make it sparkling clean. This is a daily routine done in the morning, and after classes and before bathing.

One the respondents also mentioned that it is difficult for these children to adjust to something new. He also mentioned that the first thing a child learns is to go to the toilet and where the whole is. However, some to that their autism is level 3, its difficult for them to eat, bath, or sometimes help themselves. One of the respondents mentioned said that they shower them feed them and clean them. They also said that you have to behave like them in order to make them comfortable.

The setting in the classroom at Goodwill Special Needs Demonstration Academy, there were 25 students attending. 12 girls, and 13 boys. During literacy session, the teacher sings a song for these children and it appeared as though they weren't paying attention. The researcher observed that during their free time one of the moved around while steaming as they meditate upon what the teacher sang in class. Others sat on the swing while imitating what the teacher was teaching in class. The researcher observed that some of these children are not able to write. So, they write questions for those that aren't able to write. And those that are able to copy questions from the black board write for themselves.



Figure 25; *Children during P.E lessons at Goodwill Special Needs Demonstration Academy*

Source and Explanation; In the view above, Goodwill Special Needs Demonstration Academy conducts P.E lessons for the children to keep their body active. The researcher observes that art is definitely a tool used to teach these children. Children are focusing to get the seat. The teacher puts on music for them to dance as they focus on the seat. This play helps children exercise their ability to focus and speed. The person standing was given a task to do.

The research shows that art indeed plays a big role in the learning of these children. Children with autism acquire skills through craft and also express their feelings. The researcher observed that without art in the world, the world would be a dull place. Most 3D tools used at Goodwill demonstration academy are puppetry. One of the respondents did not agree with fact that sculpture can be used as a learning aid, he argued that they

might end acting as decoration and not be a learning effect on these children. However, according to the researchers' observation, 3D learning tools pools attention of these children just like the swings, and puppetry. Some of the children which ADHD\ASD have a very high concentration, and are very kin in. they see details on one particular object, the researcher observed that from an adult with ADHD/ASD who did industrial art and Design. During the interview, the respondent, said that during his childhood he had difficult time concentrating one particular thing but with the help of care takers, and it became a gift that has helped out so many people both with ADHD/ASD. The respondent does projection ministry in church and makes posters, fliers where he earns money, he also teaches other students and makes it so easy for them to learn due to his gift. Another respondent with autism majored in painting. During her interview, she said that she loved Science subjects and passed highly in class. She also said that she challenged teachers however she dropped out of school due to the fact that they failed to understand her autistic traits. The researcher observed that there are few people that know how to handle these children. During her interview, she mentioned that she was sent to mental asylum and faced a hard time. She was transferred to a different environment where she realized that she wasn't mad but rather unique. And her teacher that made her fall in love with art. She began using art to express her feelings and also share knowledge about the world and its perspectives. Because of the love that was given to her by her teacher and parents, she is now able to stand on her own and be able to communicate to people and make friends that accepted her for who she is. In some documentaries, they call it masking.

Therapy intervention; Massaging.

One of the respondents mentioned Qigong massage as a treatment to ADHD/ASD. She said it lets energy to flow from the head to the feet. She also said massage helps children to be able to speak or heal however according to most documentaries, ASD is incurable. She also mentioned it heals various sicknesses like diarrhea. She mentioned that it doesn't work right away but after some time the child will start speaking. She also mentioned that children become very bright when they often get massage. However, the researcher believes that these children are bright because their brain highly functions, only that its overwhelming for the body to operate the way the brain rapidly operates. She said it lets energy to flow from the head to the feet but with children with autism, the blocks and numbness are in the head. She went ahead and explained that blocks are simply pains that are in the body. According to (Schreibman, 2007) its uncommon to hear about treatments from reports by parents or professionals. Schreibman also explains various treatments and what autism really is. One of the respondents referred the researcher to the book and he says that it has helped him with understand what autism really is through characteristics. However, one may have the character traits and not have autism. One of the respondents justified that statement and gave an example malaria and body temperature. He said one's body could get hot due to fatigue, and heat from the sun and assume its Malaria yet its not. Although high temperature is one of the symptoms for malaria. He also mentioned that most of the children with intellectual impairments like copying characters. If one doesn't observe, one may take her or him to be autistic yet she

or her is not. However, according to the therapist at Goodwill Special Needs Demonstration Academy, The Therapy Could Work on Both Children.

The researcher observed that after massaging the patient, the patient goes with joy and relaxation. And the brain rests from the “various sounds” in the brain.



Figure 26; *Qigong massage by the care taker at Goodwill Special Needs Demonstration Academy.*

Source and Explanation; The image above shows a specialist carrying out a therapy message. Known as Qigong massage on a child with autism. Photo by the researcher. Extracted from a smart phone camera. One of the respondents mentioned that if this massage is done half way, the child begins to walk on the tips of his or her toe. Each step

of the stage has to be followed, from 1 to 12. One of the respondents mentioned that this massage help children calm down after fighting due to emotional difficult, especially the part for feeling them. One of the respondents said that she struggled with trying to understand her child but then after the massage, she was able to speak to the child. Her child was able to speak some words.

Punishments.

One of the respondents in Goodwill Special Needs Demonstration Academy pointed out that punishments don't teach a child to become discipline but rather destroys a child by creating fear in them which makes some avoid teachers, and others anxiety levels increase. According to the researcher's observation, from different societies, and documentaries, anxiety keeps be people far from being proud of who they are in other wards insecurity growth levels are high which hinders a child from learning and being able to stand on their own. One of the respondents said that each child reacts differently. One the respondents said that if teacher wants to punish a child, the deprive the child from getting his/ her most precious toy for a moment in order to get him or her to do what he or she is supposed to do at that particular moment. And then after appreciates him or her with words like "good boy or good girl" or "amazing". This motivates the child to remain disciplined. The researcher one time entered a class room and present bread for these children. One of the kept hugging the researcher. This showed a demonstration of happiness, and so much appreciation. Hugs are a non-verbal way to show love, care and understanding which can be important to children that struggle with understanding social

cues and verbal communication. One of the respondents said that one should be empathetic before thinking of punishing a child. Or rather put himself in his or her shoes.



Figure 27; *Child at Goodwill Special Needs Demonstration Academy hugging a teacher.*

Source and Explanation; The above picture displays expressions of comfort through hugging a child a photo by the researcher. Extracted from a smart phone camera. The researcher observed that some children with autism may have some sensory processing differences. Gentle hugs may calm them down. The researcher also observed that these children learn when you get connected with them and be there friends and they become open to you. Hugs build an emotional bond and trust between the child and the teachers, caretakers or any other person hugging them. One of the respondents mentioned that some children with autism feel the energy of people and blend with them depending on the energy a person gives them. According to some documentaries, it is called masking.

Most children that mask or pretend to blend, have high anxiety levels and insecurities. Fearing whether would be accepted in society. One of the respondents also mentioned that children need love and that they are valued because they already hate themselves.

However, it's important to be mindful of the child's preferences. Some children don't like physical touch. This means that they may not like hugs as well. Respecting a child's boundary makes them feel safe

Some of them could drastically miss behave in case they don't have medication. Like fighting, destroying things like books. One of the respondents mention this during their interview. The researcher also observed this behavior happen. A child started a fight with children in class and almost killed his classmates. The respondents said he missed medication. One of the respondents also mentioned that when children miss behave, they have a meeting with the staff and they ask the child why he or she did so.

One of the respondents mentioned a scenario where he she had to sleep in boy's dormitory and the boys wanted to molest her. They had to beat the boy and let him know that it was bad.

One of the respondents sometimes they make mistakes like "pupu" and "susu" in their clothes at an age of 13. This is the part where care takers intervene with "kiboko". However, if a child is not disciplined well at an age of 2, 3, and 5 years, it becomes a bit difficult to teach him or her at ages of 12,13,14 and above. The researcher observed that caretakers at Goodwill Special Needs Demonstration Academy love and are patient with these children. One of the respondents said that it was a bit frustrating at first but with

time she was able to cope with them and love them even more. They became familiar with her and open to her and work her up whenever they needed help. both the female and male caretakers mentioned they had a challenge during their first time but as time went on, they learnt each and every one's characters. They also said that sometimes if you be tough on them, they become worse.

4.2 Autism and Color

According to the observation of the researcher from various documents, and respondents, children with autism have specific colors that they are attached to and those that they don't want to associate with. One of the respondents pointed out a scenario where a teacher had dressed in a very bright color and a child got a melt down and cried. He also mentioned a scenario where a child clang on a teacher because she had dressed up in her favorite color.

One of the children also clang onto the researcher's phone. And turned on the weathercast that was always showing blue. Each time he got the chance to the phone, he tapped the weathercast and kept scrolling.

One of the respondents with ADHD /ASD mention that their most common colors were green and blue reason being green is peaceful, green has acceptance and blue makes him feel like home, purple is royalty, devotion. He also mentioned that in the ancient days, purple was a rear color, blue was most common and that perfect is being different.

The researcher believes that just like everyone else, these children have preferences of colors and speaking their hearts out through various ways. In (the figure 7, and figure 8)

is sip and painting after the Autism awareness Conference workshop where local Ugandan Artists, patients with Autism, and other artists express themselves in painting. The autism awareness conference was organized Kyambogo University. They were provided the tools and materials for painting Canvas, the paint and the brushes. They were also provided aprons to cover themselves.

Chronologic colors were provided on the color pallet these colors included yellow, green, blue, orange. Color has an effect on children with autism although individual preference may vary even among normally developing people. Some may have strong color preferences and others may not have specific reactions on certain colors depending on their mood. It is best to observe and understand each child's unique response to colors and create an environment that suits their individual preferences



Figure 28; *Ugandan art students, children with Autism and other Artists painting after the Autism Awareness conference work shop. Kyambogo University*

Source and Explanation; *Photo by the researcher. Extracted fro smart phone camera.*

The figures above show activities of ugandan art students of kyambogo University, and

students with Autism painting. one of the children with autism painted an art piece using colors yellow, green, and black to create an environment of with trees, the sun and birds. In the observation of the researcher, he was in a happy, joyous and positive mood.in otherward there was a sense of enthusiasm created in his environment at that moment.

one of the children with autism also painted an art piece of an alligator using grey, green and yellow. In other wards there was a soothing and comfortable environment he created for himself at that moment. Green is a color associated by nature and generally, nature is soothing and calm to the community.



Figure 29; *A sip and paint after Autism Awareness conference work shop by local Ugandan art students, children with Autism, and other Artists held in kyambogo University*

Source; *Photo by the researcher. Extracted from a smart phone camera*

During the lessons of (crafts) sorting, children are told to sort particular colors. Most cases they chose the colors that they are attached to. According to the researcher's

observation, particular colors define hearts of these children. The researcher observed that most happy children were attached to yellow, and orange, those that are emotional and sensitive to people's emotional status are attached to purple. The researcher observed one of the ADHD/ASD respondent's art work. Most of the work had purple. He mentioned purple is a loyal and royal color. The researcher also observed his character. He was sensitive to people's emotions and sometimes it's too much for him to deal with the negative energy emotions. He cried when he saw someone cry, even when he didn't know the reason.

In the lessons of art where children are told to shade art pieces, they also chose their favorite colors. They also cut papers and made flowers with the guidance and support of teachers due to the fact that some of them have an element of cerebral palsy or body imbalance. according to various documentaries, art is a therapy. It draws most of the most resistant children to engage with the care takers , teachers, and parents that are using art.



Figure 30; *Goodwill Special Needs Demonstration Academy Children making art pieces. with the support of care takers.*

Source: *Photo by the researcher. Extracted from a smart phone camera.*



Figure 31; Flower art pieces drawn by children art Goodwill Special Needs

Demonstration Academy.

Source: Photos by the researcher.



Figure 32; *Children with autism at GSND A playing with a colorful piece of cloth and balls. Source and Explanation:* Photo by the researcher. Extracted from a smart phone camera, (2021)The cloth has chronologically neutral colors and the children are comfortably playing with the piece cloth. The colors include Blue, Green, red, yellow. One of children appears to be deviated from the activity happening in the figure 4 above but yet holding the cloth to play with the ball.

The colorful cloth seems to be interesting to them despite the fact that their attention seems to be divided. In this case the researcher would love to use colorful threads to create three-dimensional (3D) crochet sculptures that will feed their eyes all round and also to capture their interest. One of the autistic traits that crochet is likely to satisfy is texture sensitivity.



Figure 33; child at goodwill special needs demonstration academy refusing the red cup

Source and explanation: Photo extracted by the researcher from a smart phone camera.

The researcher also observed that children had their own color of cups during breaktime. If they didn't give them that particular color of the cup, they would refuse to eat porridge and decide to stay hungry. The child raised his hand and made a sign to mean "mean am not taking that porridge. One of the respondents said that one of the children threw the plate of food at them because he didn't like the color of the plate. The color of the plate was red in color as well. The respondents said that each child has their own preferences of cups and colors. The researcher observed that most of the colors they preferred using were blue, green, and pink. A few children were okay with the red cups.

4.3 3D crochet sculpting.

The research was studio based therefore the researcher used studio experimentation to generate ideas. The researcher had to get Source and Explanation of inspiration from the environment. The researcher had two Source and Explanations of inspiration in mind. One was bananas, and the second was elephant. Bananas are found in the almost every environment or home area in the central region. One of the reasons is that it's food that satisfies hunger.

The researcher visited the zoo and came up with the idea of an elephant as a Source and Explanation of inspiration.

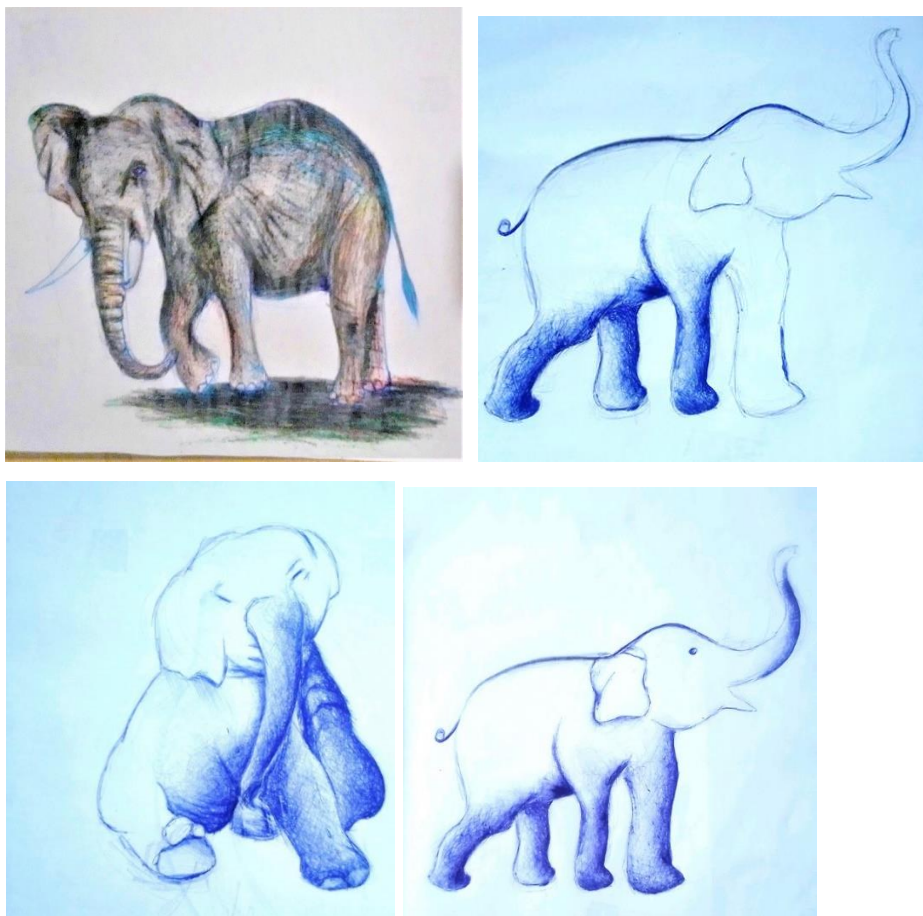


Figure 34; Preliminary studies developed of an elephant.

Source: Photo by the researcher. Extracted from a smart phone camera.

Elephant's mind is similar to children with autism. According to Bates,, Poole and Byrne (2008), an elephant has the largest absolute brain. They continue saying that it is one of the most serious cognitive challenges faced by an elephant. In this case to children with autism, the researcher believes that it is a gift especially with those that have Asperger/ ADHD. This is because they are good at solving problems due to the fact that they love math and physics due to their brainpower which is similar to that of an elephant. To understand Autism as a gift, I will use the book of Uniquely Wired: A Story about Autism and its gifts by Cook (2019) where She explains a story of a young boy Zark who loved trains and could tell you anything about trains like the longest record of miles a train has ever travel, the speed limit, the first person that built a train. In other words if they are interested in something, they get to understand them in detail

A child with Asperger/ADHD is more like a Demi god.

Bates,, Poole and Byrne (2008), say that all species of elephants form large social networks, with hierarchical, multi-level organisation, implying that they can deal deal with a degree of social complexity.

Bates,, Poole and Byrne (2008) were quoted saying that Elephants are said to dig wells to find hidden water Source and Explanations , and plug up the holes with chewed bark to prevent loss of the water to other animals.

Due to their brainpower, elephants have a long term memory just like children with autism.

The researcher went ahead and created a composition derived from an elephant .and the patterns derived from the puzzle symbol of autism. The researcher developed sketches the project as seen in the figures below.

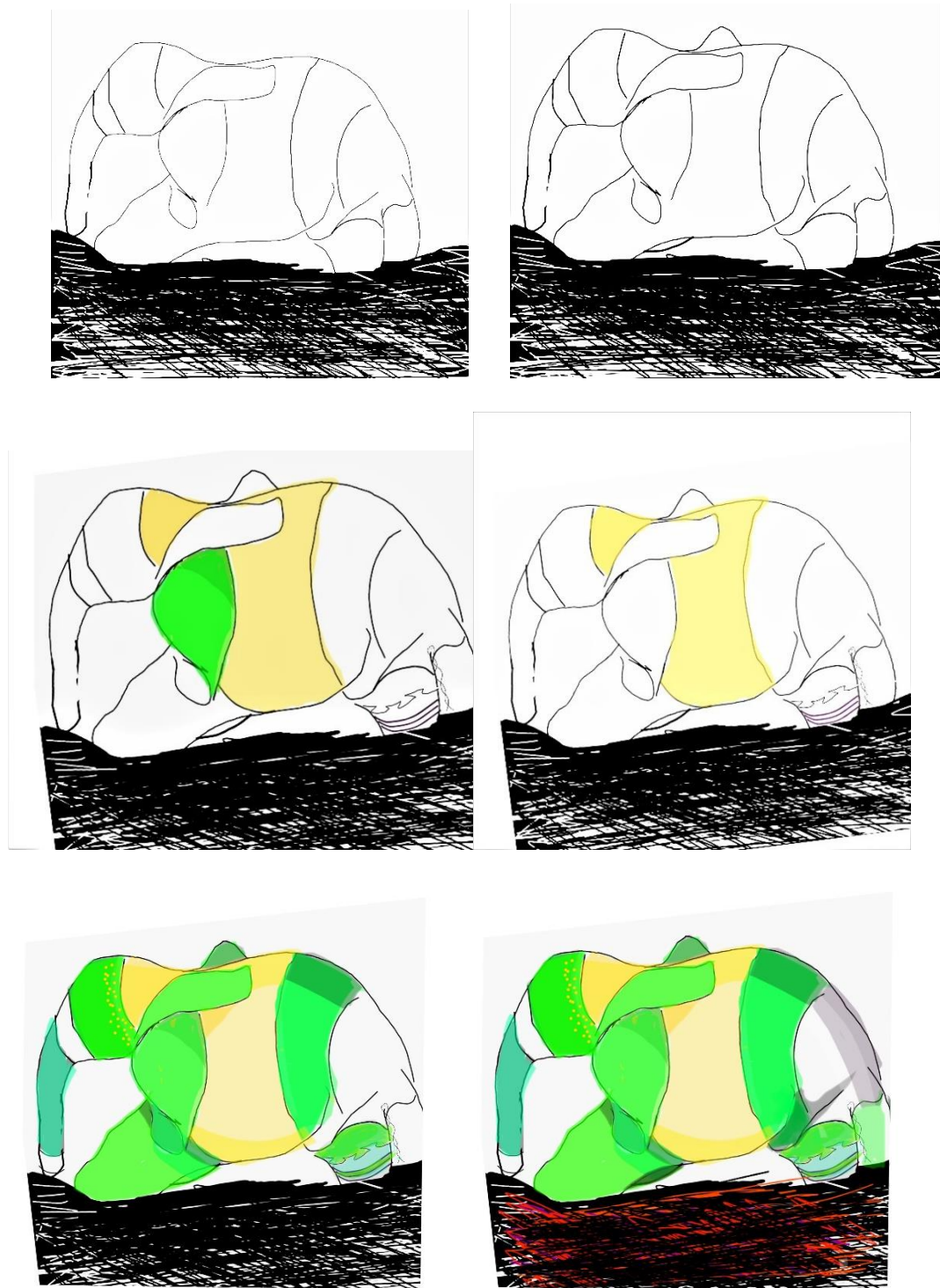


Figure 35; Selected sketches of an elephant to make the 3D crochet sculpture



Figure 36; *The scaffold of inclusive learning.*

Source: primary data.

Stitch; single stitch and half double stitch

Materials; acrylic threads.

Source and Explanation; Photo by the researcher. Extracted from a smart phone camera.

2024. This figure presents an elephant with colors yellow (cream-ish yellow), various hues of green, maroon, dark navy blue and white. However, white isn't a color in art.

It also presents letters O, P, Q, R, S, T, U, V, W which are part of the Alphabets. A to Z. scaffolding is one of the methods.

The figure also has puzzle-like patterns in the various hues of green. One of the greens is green, the other is a mixture of white and taco-ish green. When white is added to any color, we get beautiful colors. White color represents children or members with no special needs. In this case inclusive learning is so beneficial to these children. Children learn so much from each other and how to live together despite the differences. The researcher believes that there is no such thing as normal people. And that we can live and love one another and learn from one another. The researcher observed that Children with special needs help one another with various things. Those that able to help themselves help those that are not able to help themselves. Those that are able to help themselves with the guidance of care takers are represented by color. (cream-ish yellow). White are the children with no special needs care takes, teachers, cooks of Goodwill Special Needs Demonstration Academy. The researcher also believes that oneness creates a better and easier learning environment. Children are happy when they are involved in various activities together with other children. They may not speak that they are happy or show a sign that they are learning but with time, they will start to sing. we just have to let time work it out. White represents victory of the achievement.



Figure 37; *The Magic of Love*

Source: Primary Source and Explanation

Stitch: single stitch and half double stitch

Materials; acrylic threads.

Source and Explanation; Photo by the researcher. Extracted from a smart phone camera.

The figure presents an elephant with various colors on the spectrum. it was a composition of the autism puzzle symbols that have colors like Blue, red, green, yellow. Green has two hues one is the dark green and the other is the green. Yellow also has two hues one

is the golden yellow and the other is yellow. These are the same colors used in the umbrella that children were playing with in figure 32. Children were excited with the patterns and smiled. For children with autism, the researcher discovered that blue is a color of acceptance. And more of feeling at home. The researcher observed that with the demonstration of love at Goodwill Special Needs Demonstration Academy, children are able to learn from their caretakers, teachers and parents. Yellow represents happiness. What is happiness? Happiness is joy. And love creates Joy in people's hearts. One of the demonstrations of love done at Goodwill Special Needs is bathing, those that are not able to bathe themselves, cleaning them in case they have done pupu and so, therapy massaging them as seen in figure. Love takes a lot of patience too. The researcher found out that green is a color of the environment, vegetation. And vegetation gives a peaceful breeze. Love is peaceful. And with peace, a child is comfortable with learning.

The figures below show the stages of the 3D Crochet process of how it was formed.





Figure 38; *The researcher curving annealed binding wires to make rings using a bender.*

Source; Extracted from a smart phone camera. *Photo by the researcher*



Figure 39; *Rolling annealed binding wires on the amateur.*

Source; Photo by the researcher. Extracted from a smart phone camera.



Figure 40; *Crocheting using acrylic yarn*

Source; *Photo by the researcher. Extracted from a smart phone camera.*



Figure 41; Anticipation of a “Miraculous Tactile Sensation.”

Source: Primary data.

Stitch: Double stitch

Materials: metals, sponge, Acrylic threads,

Besides sculpture being a means of communication, it can also be a gate to learning and unlearning things through touch. One could call it a miracle or a dream come true or a testimony. Autism can not be cured but the traits can be reduced through education (one of the amazing therapies) its an amazing thing to hear a mother testifying about a child that had not been sitting with her even for a second for over years and then after 3 weeks,

He can sit for over 40 minutes and watch T.V with her mum. Its an amazing thing to hear a mother say that “my son recognises his name and responds” its an amaizing to tell a child sit and the child sits. Every thing is a miracle when you get to understand it intimately and set by step.

It’s a cry of a parent that is desparate to hear a child, call her “mummy”, “daddy”. It’s a cry of a parent to finally have eye contact with a child. The Grey represents the color of an elephant the Green, Yellow, Red, Blue represends the ASD. According to Satiansukpong, Pongsaksri and Sasat 2017,elephants have a conection with children with autism spectrum disorder and love the character of an elephant, one of the respondents gave me a lot of details about an elephant tat I didn’t know. She mentioned that an elephat is the smartest animal, and has big brains, and is also the most caring animal. She also mentioned that it keeps so many memories.

No wonder they are connected. Some children with autism spectrum disorder have so much memories they keep. Every positive and negative energy you inflict never goes. Its stack. In there brains like a song they love to sing for decades and decades. There could actually remind you of things you said or did and yet you don’t remember. The can surprise you.



Figure 42: Children with Down syndrome and (ASD) bathing an elephant

Source: Secondary data. Retrieved from: (Satiansukpong, Pongsaksri , & Sasat, 2017)

Assessments of students

One of the respondents said that Goodwill Special Needs Demonstration Academy makes assessments for children in order to understand children individually. One of the respondents mentioned that they have a checklist that helps to know the prenatal history both during birth and after birth of the child and postnatal history of the child. The respondent mentioned that the child could also be affected by environmental factors, he gave a scenario where parents are fighting brutally and accidentally heat a Childs head, he also mentioned scenarios where there is domestic violence. However, according to documents, domestic violence, divorce, and scenarios of children taking over big responsibilities probably due to parents with bipolar disorders, or alcohol addiction causes PTSD. One of the respondents also mentioned that accidents could cause intellectual impairments but with treatment its curable unlike ASD which is not. Postnatal involves, cognitive information of the child, social skills, emotional status

levels. This helps them deal with students individually and not leave anyone out in the equation. And understand each one's capability and state of understanding in order to help them stand on their own. It also helps to document the progress of the children. One of the respondents teaching in the school mentioned that they grade the children according to their ability. Not age. He gave an example of one child had never spoken till the age of 18 but later after she was able to say "am fine." Those that were conversant with what to do with the beads made necklaces, ear rings, bags and others. Other students that are where conversant with threads made door mats with the guide of teachers. According to the researcher's observation, most of these materials used are bought from funds got from various organizations like The Standard Digital Uganda Christian University, Promise international, and the community at large.



Figure 43; *Ability class 6 child with Autism at Goodwill Special Needs Demonstration*

Academy making a bag out of beads.

***Source ;** Extracted from a smart phone camera.*



***Figure 44;** Ability class 4 children at Goodwill Special Needs Demonstration Academy*

Making Door Mat. Photo by the researcher

***Source;** Photo by the researcher. Extracted from a smart phone camera.*

Most of these things are displayed on big days during visitation days, among others. During the World Autism Awareness Day, various special schools like Teens and Totts, Silent Angels, Doreah Childcare Uganda and organizations like Advancing Autism Support Organization, sunshine Trail reSource and Explanation center autism among others were invited at Kati Kati restaurant. Children with Autism expressed themselves through various activities, like dancing, singing, playing music instruments, like band.

They also displayed their works to show the world their amazing abilities., one of the things they displayed were paintings, necklaces, door mats. As a researcher I saw great artist and not people with these were more of these happy places.



Figure 45, *Paintings displayed by Teens and Tots Special Neuro-development Center after World Autism Awareness Day match on 2nd of April 2024 Kati Kati Restaurant.*

Source; Photo by the researcher. Extracted from a smart phone camera.



Figure 46; *Doormat Crafts displayed by Silent Angels after the World Autism Awareness match on 2nd April 2024 at Kati Kati Restaurant.*

Source and Explanation; Photo by the researcher. Extracted from a smart phone camera.



Figure 47; *doormat and bead crafts made by Teens and Tots Special Neuro-development Center after the World Autism Awareness match on 2nd April 2024 at Kati kati Restaurant*

Source; *Photo by the researcher. Extracted from a smart phone camera.*



Figure 48; Sisal doormats displayed by Teens and Tots Special Neuro- development Centre after World Autism Awareness Day match on 2nd of April 2024 Kati Kati Restaurant.

Source; Photo by the researcher. Extracted from a smart phone camera

One respondent from Kenya said collected various vulnerable woman and provided yarn for them to crochet using various colors. Then collected them to sell during the east African common market exhibition on 8th to 18th December 2022. This was an act of supporting feminine among women. They made things like costumes bags, jewelry pots made out of crochet, table mats. As seen in the figures below. The EAST African community exhibition supported trade and builds Friendship among the East African Countries.

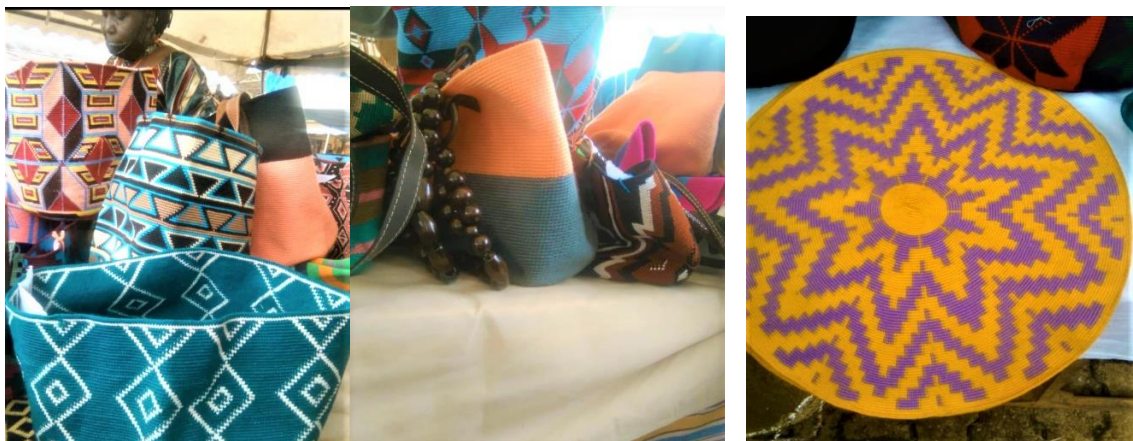


Figure 49; Kenyan Bags, jewelry pots, and table mats made out of Crochet made using acrylic threads. East African community Jua Kali Exhibition. Kololo Indolence Grounds.2022

Source; Photo by the researcher. Extracted from a smart phone camera.



Figure 50; *Tanzanian Crochet baby shoes, sweaters, and costumes made by acrylic threads. East African community Jua kali Exhibition. Kololo independence grounds.2022.*

Source; *Photo by the researcher. Extracted from a smart phone camera.*



Figure 51; *Ugandan Crochet bags. East African community Jua kali Exhibition. Kololo independence grounds.2022.*

Source; Photo by the researcher. Extracted from a smart phone camera

Sculptural artists, Judy Tadd man, Shauna Richardson created sculptures using plane colors of sisal. The researcher observed that sisal, raffia, and cane have a rough texture.

The first step the researcher did was to create various sketches, to guide her with selection of project.

Second step the researcher did was to select from the various sketches what project was to be done. And the colors. The colors were selected according to the mood of the child. However, the researcher chose green because green is a peaceful color. Majority of the researchers' respondents pick green. And there reasons where, acceptance, peace, those that chose yellow and orange where the happiest souls and sweet tempered. The researcher believes that colors speak so much of a person. Those that chose purple had a lot of energy they were hyper active. one of the adult respondents on the spectrum mentioned purple is devotion to him.



Figure 52: *Guided discovery*

Source; *primary data.*

Material; *acrylic yarn*

Stitch; *single stitch and half double stitch.*

Source and Explanation; Photo by the researcher. Extracted from a smart phone camera.

The researcher made a portal type for her project. The prototype depicts sound letters A, E, I, O, U are some of the sounds taught by teachers in Literacy 2 which is reading and

writing, guided discovery is one of the methods used in teaching, where a teacher reveals something small about a topic and leaves the child to discover for him or herself. For example, A, E, I, _ _ the child will have to complete for him or herself

The researcher chose the puzzle-like patterns because most children and children with autism use puzzles to solve a problem or investigate, and self-correction. In other words, they reinforce the connections between brain cells and improve mental growth speed. That's why teachers give them holiday packages, to figure out things like sounds. And matching the similar objects. This method doesn't imply only on children with autism but other children as well. From Top class to P.2.

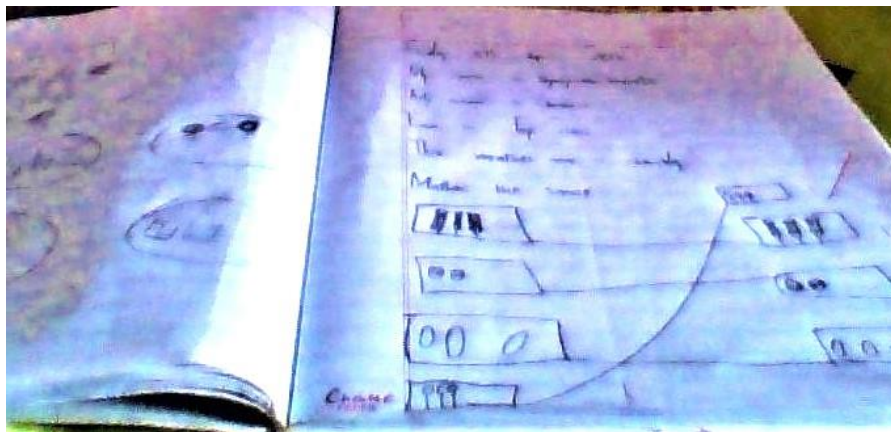


Figure 53; *Class exercise for a child at Goodwill Special Needs Demonstration Academy.*

Source; *Photo by the researcher. Extracted from a smart phone camera.*

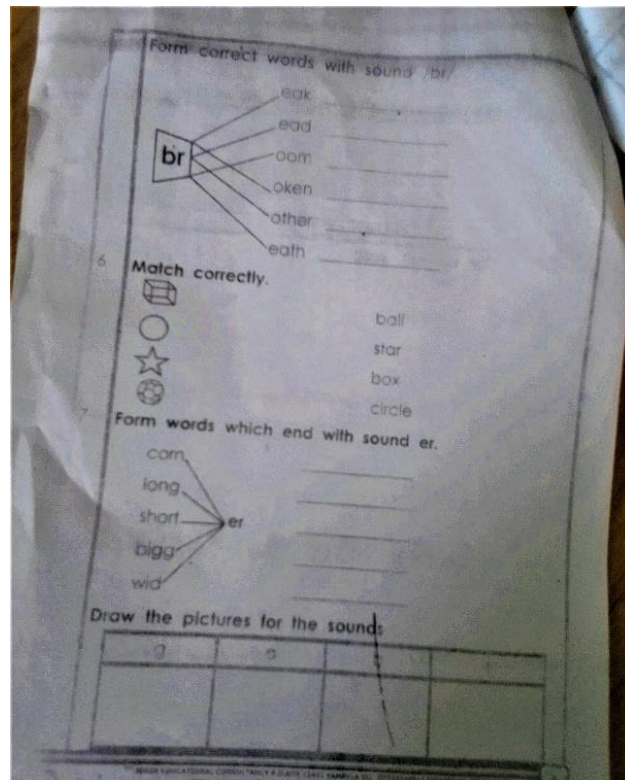


Figure 54; Home work for a child.

Source ; Photo by the researcher. Extracted from a smart phone camera

The researcher analyzed the banana from the its stage of growth to the time it ripened.

And developed the sketches.

Below are the sketches of the first Source and Explanation of inspiration;



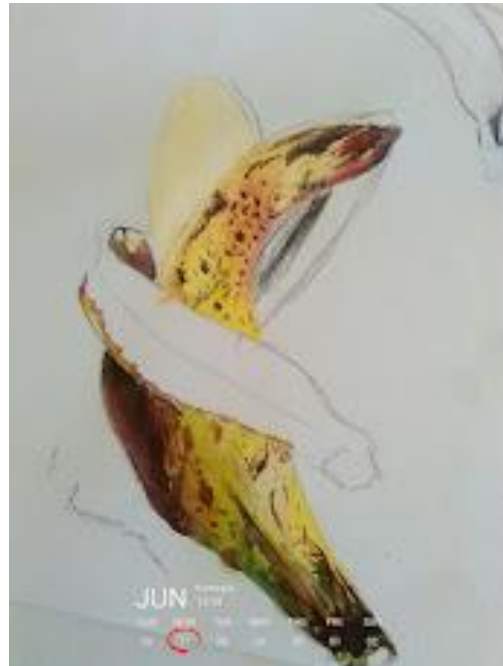




Figure 55: *Preliminary studies developed of bananas.*

Source; *Photo by the researcher. Extracted from a smart phone camera.*

Tools and materials.

Materials used to develop the sketches were pencils, poster colors, A3 manila papers canvas. There were used because they were available and cheap. There researcher developed ideas from observation to abstract and distortion. The researcher also used acrylic threads due to their durability to execute her final work.



Figure 56: *Development of distortion of bananas*

Source; *Photo by the researcher. Extracted from a smart phone camera*

The other advantage of the threads is that it created different patterns, and textures in the work.

Below is some of the work done by the researcher on canvas..



Offcuts



Hook



Pair of Scissors



Soft Sponge

Figure 57; Tools and materials used in the production of 3D crochet sculptures

Source; Photo the Researcher. Extracted from phone camera.

After development of sketches, the researcher developed 3D crochet sculptures deriving from the sketches. Using the tools and materials above in figure

The researcher used various colors of acrylic threads to create the 3d crochet.

Below are the some of the pictures of the 3d sculptures derived from the first Source and Explanation of inspiration.



Figure 58: 3D crochet sculptures of bananas.

Source; Photo by the researcher. Extracted from a smart phone camera. 2022

CHAPTER FIVE

DISCUSSION, CONCLUSION, AND RECOMMENDATIONS

5.0 Overview

This chapter include, the discussions, the conclusions and the recommendations of the study following the objectives which include;

To analytiically identify the learning aids used to teach Children with autism

To analyze the reaction of Children with autism toward Certain Colors on the Spectrum

To create 3D Crochet Sculpture for Goodwill Special Needs Demonstration Academy (GSNDA) representing Various Autistic Colors of the Autism Spectrum.

5.1 Discussions.

According to various documentaries, autism is genetical and also sometimes caused by environmental factors like accidents, however, some people could have social difficulty due to trauma. (PTSD), which could heal with therapy. Others could mistake it to be Bipolar. Others could have some of these traits but that doesn't mean they are on the spectrum. Various researchers are trying to understand what really is the cause of autism and the treatment. Schreibman (2007) says that because of the absorbing and curious characteristics of the disorder and the all- encompassing nature of its effect, autism has received a great amount of meticulous attention from psychologists, psychiatrists, pediatricians, neurologists, speech and language specialists, educators, parents and others whose responsibility it is to understand and help these children and adults. Schreibman

furthermore says controversies are most likely to arise when things are poorly understood, and this is certainly the case with autism. Schreibman continues to say that controversies keep discovery moving forward.

In the achievement of the first objective which is learning aids. The researcher observed that teachers go to any length to teach children so that they could understand certain things. One of the respondents mentioned that they go collect bottles of Rwenzori from dust bins to show these children. He also said that these children learn by demonstration method of teaching. However, that depends on the child. He also mentioned peer influence method, where a brilliant and quick child helps the one that is slow one.

Despite the fact that specialist Sembatya, (2014), devoted himself to bring awareness to east Africa, there are still few people that know about these children. Therefore, there are few people that are able to take care of these children. One of the respondents said that they dismiss parents because they don't have trained care takers to take care of these children and trained teachers as well. Most of these children face so much from untrained teachers. due to the fact that they don't know, they call them things like lazy, which demoralizes the child yet they are generating so much in their Brain but just find it hard to do. one of the respondents said when they beat them every time, they could fight back, or stop listening to the you. One of the respondents said that massage that care takers, and parents should be trained how to give qigong massage. It's a treatment for the speech, diarrhea in Kireka Home school, there are about 5 teachers and over 95 children. One of the respondents mentioned that when most the teachers upgrade to specialists, it's quite difficult to replace them. Yet these children need individual attention and care in

otherward love is the therapy. Love beyond empathy and compassion. It reduces on their anxiety levels.

Professionals are under looked by parents and guardians due to impatience and desperation, limited information about how to deal with autism. During visitation day, children were visited and the researcher observed a parent complained about her child being small. She didn't see the part where a child was improving on his speech.

During the World Autism Awareness Day, 2nd April, one of the respondents also mentioned that some of these children are thrown on the streets and abandoned by their parents and then policemen take them to "Butabika Hospital" and then they inject them with psychotic medicine for the mad yet they are actually not mad and they need therapy. In other wards the awareness is still minimal. However, one of the respondents mentioned that with most profound cases, where a child is out of control, like a person stripping himself or herself and running on the road, stoning people, medication is involved.

Challenges faced by these children are numbness, some face a problem of lack of emotional control difficulties hence having fights. Some face language problems. One of the child was using Rwandese which was a bit difficult for teachers to engage with her and connect.

In inclusive schools, much as they support children with autism, they are a victim of stigma and this affects there education as well. According to Jasper 2019, the findings of the studies in Entebbe municipality and kakiri Sub county provide insight into how stigma affects the lives and educational opportunities of people with ID. This is due to

the negative attitudes from teachers. And the negative mindset about children on the autism spectrum. According to Jimoh, et al. (2024, p 42), adapting teaching strategies to empower learners with ID in inclusive environments is a complex endeavor that demands a comprehensive understanding of the individual and their unique needs within the broader societal context. The methods involve promoting evidence-based practices tailored to the needs of learners with ID (Jimoh, et al. 2024, p 42). The researcher believes that positive energy among teachers plays a big role in empowering learners with autism and improving their social behaviors. Johnson and Lee (2024) demonstrate that implementing Positive Behavioral Intervention Support (PBIS) in inclusive classrooms significantly reduces disruptive behaviors and improves social interaction among students with ID. However, it starts with the teachers. The researcher observed that some teachers gave up on the children due to the bias they had about the children which stigmatized the children. The findings of Kabunga , et al. (2024) show that Teachers expressed difficulties in recognizing ASD, lack of specialized training and resource and Explanations, and the emotional toll of their work. Stigma and discrimination were pervasive, affecting both students and teachers. Teachers favored holistic approaches over medication, emphasizing the importance of supportive environments.

In the second achievement, to understand the reaction of colors of the spectrum towards the children. The researcher observed that the majority of these children mentioned blue and green as their favorite color. She also observed that they were peaceful. However, some of them struggled with acceptance, and dealing with rejection. they want to be listened to.

She also observed that those that chose yellow and orange, had a happy soul. The achievement is that the researcher selected colors depended on their preference. According to Al Maqbool (2020), color perception is very important in the educational environment of children with autism. The study used softer shades of colors like green, blue, purple, light blue, golden yellow and grey to make learning aids for the children.

The findings also revealed that some of the colors on the spectrum were uncomfortable for most of the children with autism. Like Red. However Red is also on the symbol of the autism spectrum. When the researcher combined the colors that are on the umbrella, the researcher observed that one child was so attached to the prototype that she had made. The plain red scared the child and he kept running away from the plain red prototype.

The third objective was to create crochet sculpture for Goodwill Special Needs Demonstration Academy. The researcher developed various sculptural prototypes that were used for learning at Goodwill Special Needs Demonstration Academy. These included bananas, and elephants using various colors of the spectrum. In the achievement of this objective, the researcher various used colors of acrylic threads to create sculptures, and borrowed graphics, to create alphabetical letters, and motivation words for the children on the sculpture. those children learn and read with the guide of teachers.

The colors selected depended on the preference of the children. Children liked bright colors like lemon green, they also liked colors like purple, and blue.



Figure 59; Children with Autism at Goodwill Special Needs Demonstration Academy
learning colors through the 3D Crochet sculptural bananas with various colors

Source: Photo by the researcher. Extracted from a smart phone camera.

Some of the children were excited to see the bananas and touch them. One of the pupils started singing “axe mbazi, banana matooke” And they were all full of joy in the lesson. One of the pupils expressed their feelings through jumping. the researcher observed that these 3D sculptures created talking environment in the class.

One of the respondents mentioned one the methods used to teach these children. Scaffolding method which emphasizes teaching from known to unknown. She gave an example of asking a child what color is this? And then he or she mentions a different color. A teacher praises the child and then corrects him or her. A child may know one color but at that moment you introduce her or him to new color.



Figure 60; Children with Autism at Goodwill Demonstration Academy feeling the texture of the 3D Crochet Sculpture

Source; Photo by the researcher. Extracted from a smart phone camera.

Research reveals that crocheting is very common and has been used in the diaspora. The origin of crochet is unknown; however, it was common, in Europe, Arabia, and Africa. Crocheting has traditionally been used by women in various societies in Uganda. Make

costumes, table mats, wall hangings and so many others. According to Cosh and Walters.(2014) texture is one of the fashions in crochet as seen in the figure of a butterfly below.



Figure 61; *Crochet butterfly*

Source; *Extracted from Cosh and Walters. (2014)*

There are various techniques of crocheting. The basics are single stitch, half double and double stitch. Each of these technics give different textures or feels.



Figure 62; Ever decreasing circles

Source and Explanation; Photo by Cosh and Walters. (2014). Knitted in double stitch technique

Sculptural artists, Judy Tadd man, Shauna Richardson created sculptures using plane colors of sisal. The researcher observed that sisal, raffia, and cane have a rough texture

Sculptural artists, Judy Tadd man, Shauna Richardson created sculptures using plane colors of sisal. The researcher observed that sisal, raffia, and cane have a rough texture.

5.2 Conclusion

The study underscores the critical need for specialized learning aids tailored for children with autism, particularly focusing on three-dimensional (3D) crochet sculptures. Traditional 2D learning tools often fail to engage these children, who may struggle with

typical learning environments and aids not designed for their unique needs. The research, conducted through a qualitative ethnographic approach at Goodwill Special Needs Demonstration Academy in Kireka, Kampala, involved direct observations and purposive sampling to gather comprehensive data from head teachers, teachers, children with autism, and caretakers.

The findings revealed that 3D crochet sculptures significantly benefited children with autism by facilitating color learning and sensory exploration. The children responded positively to the tactile nature of the sculptures, which helped them express their sensory abilities through touch and feel. Additionally, sculptural puppetry emerged as an effective tool for incidental learning, demonstrating that play-based activities can enhance educational outcomes for these children.

In conclusion, integrating 3D crochet sculptures into the learning environment of children with autism can bridge the gap left by conventional learning aids. This study highlights the importance of developing and implementing specialized educational tools that cater to the sensory and learning needs of children with autism, ensuring a more inclusive and effective educational experience.

5.3 Recommendations

The researcher recommends inclusivity of children with Autism in schools. Inclusiveness plays a very big role in the development of these children both socially and academically. social separation hinders the development of these children. And also worsens

stigmatization among themselves. Inclusivity may not be a cure but it reduces on some of the traits among these children.

The researcher cries out to the government to support and recognize special schools as well just like the way other schools have been supported both financially and physically. There are fewer teachers trained with special needs education than those in other schools. The researcher also recommends that Goodwill special needs demonstration should hire more teachers trained with special needs education to teach these children. It's quite hectic to handle 20 special children at once especially when it comes to self-help skills where it requires a teacher to have a personal relationship with the student.

The researcher recommends that the more pumpers, pads should be supplied to caretakers to limit pup on the ground this also limits cases where children with severe autism eat the pup and then end up with diseases.

The researcher also recommends that more gloves and protective devices should be provided to care takers and teachers as well due to the fact that some children might have blood transmitted diseases like HIV\AIDs. In case of any bleeding, there is a possibility of transmission of blood.

The researcher recommends that schools provide a conducive learning environment with favorable colors for children with autism due to the fact that colors are a powerful tool in the learning process of these children.

The researcher recommends artists to explore more about affordable traditional materials to make colourful sensory and tactile learning aids for children with autism to benefit a wider population of schools, and autism centers.

The researcher encourages people that are struggling with anxiety or PTSD to involve themselves in crocheting activities. Crocheting is therapeutic and may be of benefit in reduction of anxiety. It could also help in emotional well being of people not just people with autism but also people that are stressed. According to Martin, 2009, an art therapy environment can help a child with ASD make this transition much more successfully than an art education environment can. The rich sensory experience of art making as well as its ability to encapsulate and organize complex topics makes art therapy a natural fit for individuals with autism. Furthermore, Martin says that, Sensory regulation is often less stressful for the client in art therapy because the art provides a product to focus on beyond the process of integrating uncomfortable sensory experiences.

The researcher recommends that parents take their children to autism reSource and Explanation centers for Therapy early enough. Autism may not cure but therapy helps to reduce some of the autistic traits.

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APPENDICES

APPENDIX A: INTERVIEW GUIDE

THREE-DIMENSIONAL (3D) CROCHET SCULPTURE AS A LEARNING AID FOR CHILDREN WITH AUTISM.

Particulars of Respondent

Title (Mr, Mrs, Dr, etc).....

Sex,(i) Male.....(ii) female

Age.....

1. When was Goodwill Special Needs Demonstration Academy established?

.....
.....
.....

2. Who was the founder of Goodwill Special Needs Demonstration Academy?

.....
.....
.....
.....
.....

3. What are the most common autistic traits found in a child?

.....
.....
.....

4. How is one able to understand the sentiments of an autistic child?

.....
.....
.....
.....

5. How can one deviate an autistic child from something that has caught his or her eyes?

.....
.....
.....
.....

6. How can one capture an autistic child's interest.?

.....
.....
.....

7. Can education be a treatment for autism? Yes..... no.....

8. If yes, how is education a treatment to autism?

.....
.....

.....
.....

9. What are the learning aids used to teach children with autism?

.....
.....
.....

10. Does Attention Deficit Hyperactivity Disorder (ADHD) affect children with Autism as well?

.....
.....
.....

11. What are the signs and symptoms of ADHD?

.....
.....
.....
.....

12. How can one help a children control ADHD?

.....
.....
.....

13. Does art play a big role among children with Autism? (how)

.....

.....

.....

.....

14. Is being picky and sensitive to texture one of the autistic traits?

.....

.....

.....

.....

.....

15. Do children with autism have color preferences? Why?

.....

.....

.....

.....

16. Do bright colors affect these children? How?

.....

.....

.....

17. Does texture interest children with autism?

.....
.....
.....

18. Does puppetry capture the interest of children with autism? Why?

.....
.....
.....
.....
.....

19. What type of puppetry is used and why?

.....
.....

20. What challenges do you face with these children?

.....
.....
.....

21. Are you familiar with acrylic threads?

Yes.

No.

22. How have they been used?

.....

23. What do you understand by the term crocheting?

.....
.....
.....

24. Have you ever seen crochet pieces?

Yes.

No.

25. If yes, where did you see it from?

.....

26. What type of crochet was it?

.....

27. Have you, ever crocheted?

Yes.

No.

28. What did you crochet?

.....

29. What technique did you use?

.....

.....

30. What material did you use to crochet?

.....

.....

End

APPENDIX B: INTRODUCTORY LETTER

KYAMBOGO UNIVERSITY

P. O. Box 1 Kyambogo, Phone: 041-285001/2 Fax: 041-220464

www.kyambogo.ac.ug

SCHOOL OF ART AND INDUSTRIAL DESIGN

DEPARTMENT OF INDUSTRIAL AND COMMERCIAL ART

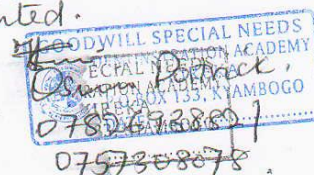
MASTERS OF ART AND INDUSTRIAL DESIGN

...../12/2023

TO THE H/TEACHER GOODWILL
SPECIAL NEEDS DEMONSTRATION
ACADEMY.

Dear Sir/Madam,

Permission to carry out
research has been
granted.



TO WHOM IT MAY CONCERN

This letter introduces **KOOTE PATIENCE** a final student of Masters in Art and Industrial Design (MAID) Programme at Kyambogo University. Registered under number **21/U/GMAID/14264/PE**.

In partial fulfillment for the award of a MAID Programme at Kyambogo University, she is expected to conduct a research study in a specialized area as approved by the school graduate board.

The purpose of this letter therefore, is to request you to allow her to conduct Research at in Goodwill Specials Needs Demonstration Academy and accord her the necessary support for the study.

Looking forward to your kind cooperation.

Yours Sincerely,

Prof. Kwesiga Philip

Head of Department, Industrial and Commercial Art

APPENDIX C; PARENTAL CONCENT FORM.

Parental Consent Form

Name _____ Age _____ Birth Date _____ Gender _____

Address _____ Phone (____) _____

School _____ Current class _____

Parent(s) cell phones _____

Parent Email address: _____

TO WHOM IT MAY CONCERN:

The Parents/guardians hereby give permission for our (my) child,
_____, to attend and participate in all activities

of the research by KOOTE PATENCE from the time June to October 2023.

We sanction an adult, in whose care the minor has been entrusted, to consent to the participation of the research **COLORED THREE-DIMENSIONAL (3D) CROCHET SCULPTURES AS LEARNING TOOLS FOR CHILDREN WITH AUTISM**, at Goodwill Special needs demonstration Academy. The child will have free will of engagement in the research. Photos will be taken and be used in the dissertation. The child will not be forced if he/she doesn't want to be taken photos. the consentor will be in charge of the child if they get any anxiety issues or any melt downs during the participation of activities.

Hospital Insurance Yes ___ No ___

Insurance company _____

Policy _____

Emergency Phone _____

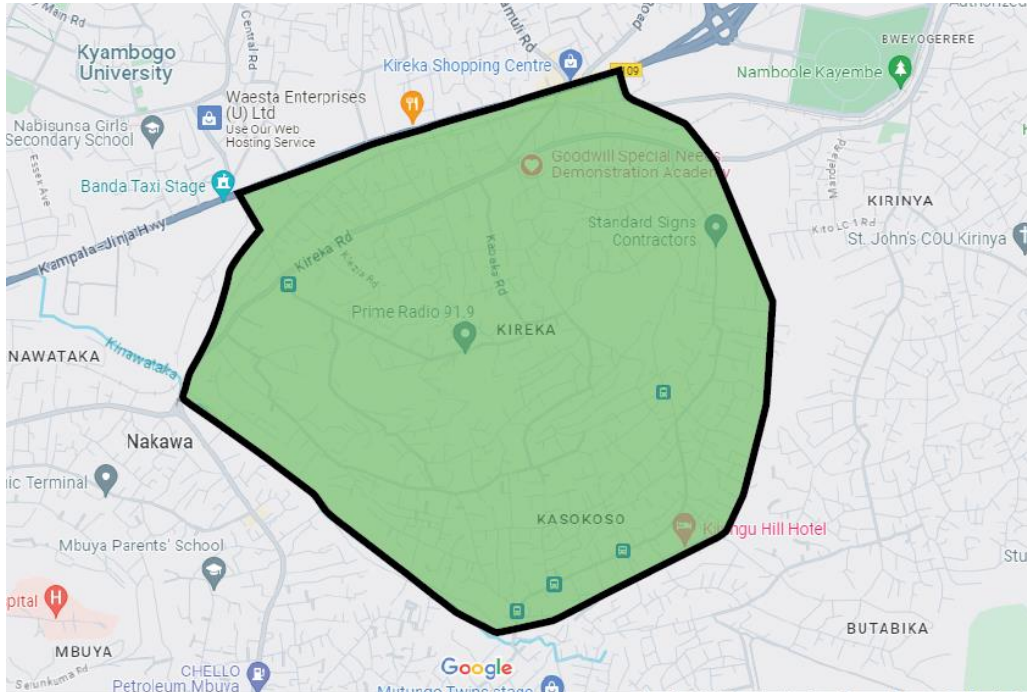
Participant _____ Date _____

Father _____ Date _____

Mother _____ Date _____

Legal guardian _____ Date _____

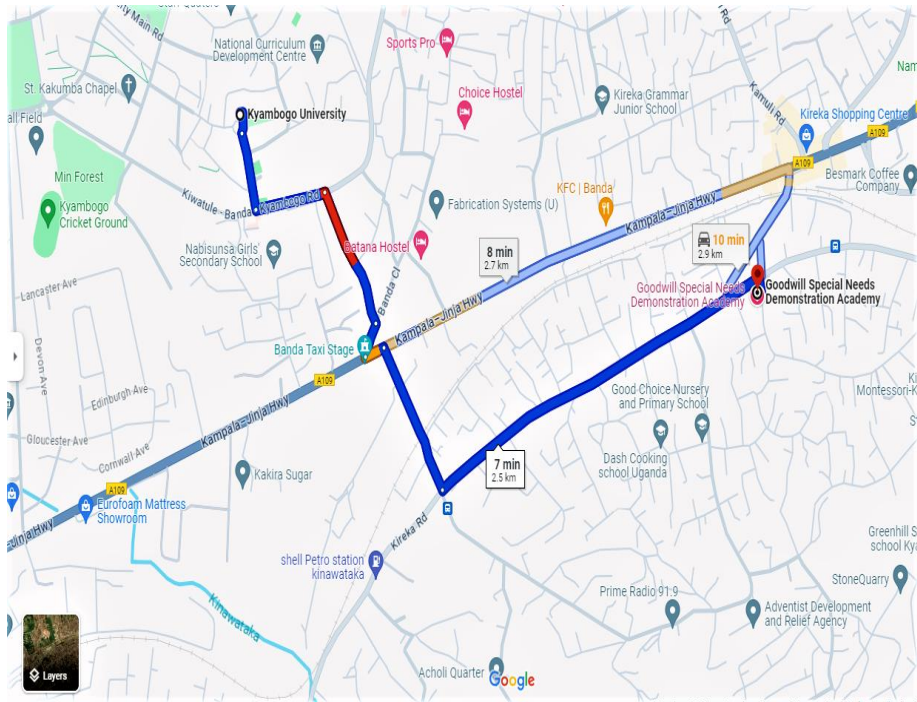
APPENDIX D: MAP OF KIREKA



Map of Kireka adapted from google map

APPENDIX E: LOCATION OF GOODWILL SPECIAL NEEDS

DEMONSTRATION ACADEMY ON A MAP.



Map from Kyambogo University to Goodwill Special Needs Demonstration Academy.

Adapted from google map.

COLORED THREE-DIMENSIONAL (3D) CROCHET SCULPTURES AS LEARNING AIDS FOR CHILDREN WITH AUTISM: A CASE OF GOODWILL SPECIAL NEEDS DEMOSTRATION ACADEMY

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