International Journal of Sociologies and Anthropologies Science Reviews
Volume 5 Issue 5: September-October 2025: ISSN 2985-2730
Website: https://so07.tci-thaijo.org/index.php/IJSASR/index

The Application of Sensory Teaching Aids in Art Therapy for Children with Autism Spectrum Disorder (ASD)

Lianyuyun Deng[1]; Chanoknart Mayusoh[2*]; Akapong Inkuer[3]; Permsak Suwannatat[4]
[1; 2; 3] Faculty of Fine and Applied Arts, Suan Sunandha Rajabhat University, Bangkok, Thailand
[4] Faculty of Fine and Applied Arts, Chulalongkorn University, Bangkok, Thailand
[1]E-mail: s65584948027@ssru.ac.th ORCID ID: https://orcid.org/0009-0004-3303-1660
[2*]E-mail: chanoknart.ma@ssru.ac.th ORCID ID: https://orcid.org/0000-0002-8063-549X
[3]E-mail: akapong.in@ssru.ac.th ORCID ID: https://orcid.org/0000-0003-4605-8390
[4]E-mail: permsak.s@chula.ac.th ORCID ID: https://orcid.org/0009-0006-7720-058X

Received 28/05/2025 Revised 21/06/2025 Accepted 12/08/2025

Abstract

Background and Aim: The growing interest in art therapy for children with Autism Spectrum Disorder (ASD) has highlighted the need for innovative approaches. This study explores the effects of integrating sensory materials—clay, straws, and sponges—into art therapy programs. It aims to develop teaching tools tailored to the sensory characteristics of ASD children in special elementary schools in Guangdong Province and assess their real-world effectiveness.

Materials and Methods: Combining qualitative and quantitative approaches, the study recruited 30 children with ASD (aged 6–9 years) from three special elementary schools in Guangdong Province and 10 art-therapy practitioners for fieldwork, semi-structured interviews, and classroom observations. A three-stage teaching-aid system was co-designed with these practitioners and then evaluated by the same 10 experts using the 10-item System Usability Scale (SUS) administered immediately after a five-month intervention.

Results: SUS assessments yielded a mean value of 72.05, reflecting high satisfaction with the tools. A three-stage progressive sensory teaching aid system effectively promoted neurobehavioral development in children with ASD.

Conclusion: This study confirms that a three-stage, clay–straw–sponge teaching-aid system significantly strengthens fine-motor control, hand–eye coordination, and sustained attention in 6- to 9-year-old children with ASD in Guangdong's special elementary schools. The empirically derived mean SUS score of 72.05 demonstrates that educators and therapists regard the tools as highly usable in authentic classroom settings. These findings validate the intervention's practical value and offer replicable guidance for integrating sensory materials into art-therapy curricula for children with ASD.

Keywords: Art Therapy; Children with Autism Spectrum Disorders; Sensory Materials; Fine Motor Handedness; System Usability Scale

Introduction

Autism spectrum disorder (ASD), the most prevalent neurodevelopmental disorder in Chinese children (about 1%), poses a serious challenge to the public health system with its social impairments and stereotypical behaviors (Zhou et al., 2020; Wan et al., 2021). Art therapy, with its nonverbal expressive strengths, has emerged as a core intervention for improving emotion regulation and perceptual integration in children with ASD (Lee, H., & Park, S, 2020). And the multimodal stimulus properties of sensory materials have been shown to break through ASD sensory processing barriers from tactile, visual, auditory, and synergistic perspectives (Cho, 2021). Despite the increasing use of sensory materials in children's special education through art therapy, there are significant gaps in researchers' knowledge of the specific contributions and effects of sensory materials in art therapy due to a lack of research related to sensory materials in art therapy. Providing quality educational and therapeutic support for children with special educational needs (SEN) is a pressing issue in Guangdong Province, China. In view of this, this study focuses on three basic sensory materials, namely clay, straws, and sponges, each with its own unique characteristics, and uses them as the core for systematic teaching aid design and development. The combination of these three materials has a positive effect on children with ASD in terms of the stimulation of the hands, eyes, and brain brought by the sensory materials, which in turn improves hand-eye balance, muscle exercise, and fine motor skills. The selection of the three sensory materials, the planning of

Citation
Deng, L., Mayusoh, C., Inkuer, A., & Suwannatat, P. (2025). The Application of Sensory Teaching Aids in Art Therapy for Children with Autism Spectrum Disorder (ASD). International Journal of Sociologies and Anthropologies Science Reviews, 5 (5), 1109-1120; DOI: https://doi.org/10.60027/ijsasr.2025.8306

interventions, and their adaptability to the different developmental stages of children with ASD are what this paper needs to explore.

Objectives

1. To develop teaching tools adapted to the sensory characteristics of ASD children in a special elementary school in Guangdong Province.

2. To evaluate the effectiveness and applicability of sensory material teaching tools in real educational scenarios.

Literature review

1. Use of sensory materials in art therapy interventions for children with ASD

In special education, Sensory materials are materials such as color, texture, oil sticks, clay, and fabric, which have been recognized as valuable tools for increasing the therapeutic potential of art therapy sessions (Jones & Thompson, 2019; Lee et al., 2020). According to recent research, many multifunctional materials can be squeezed, shaped, and molded by children with ASD in special education. According to recent studies, versatile materials like modeling clay are effective in special education for children with autism spectrum disorder (ASD), as they support squishing, shaping, and molding activities. These materials enhance fine motor skills and hand-eye coordination. Modeling clay, for instance, requires firmer pressure for shaping compared to softer materials, offering a distinct sensory experience. Research indicates that such tactile engagement promotes focus, hand-eye coordination, and fine motor skill development in children with ASD (Barton et al., 2018; Pfeiffer et al., 2020). There is another sensory material, which is kinetic sand, which has a unique, flowing texture that can provide calming sensory input while requiring manipulation for molding and shaping, which can enhance fine motor skills and hand-eye coordination (Case-Smith et al., 2015).

2. Research on the effectiveness of sensory materials in art therapy interventions for children with ASD.

A study analyzed the effects of combining sensory integration with art therapy in children with ASD, and through the combined use of tactile, visual, and sound materials, the children demonstrated significant improvements in communication and emotional management. It is recommended that multisensory elements be incorporated into treatment programs to enhance efficacy (Unwin et al. 2024). This study evaluated the role of sensory materials in reducing anxiety in children with ASD. The use of soft, malleable materials (e.g., clay, sand) was found to significantly reduce anxiety levels and enhance children's willingness to participate and duration in art therapy. (Asmika et al. 2018) Research has explored the utility of sensory materials in enhancing the social skills of children with ASD. Art activities that included multiple sensory stimuli (e.g., touching paint, sensory boxes) helped enhance children's social interactions and improve their cooperation and communication skills. (Ghazali et al. 2018) Through the use of brightly colored and richly textured materials, children were found to be able to express their emotions more freely during the art-making process, significantly improving emotional regulation and expression.

Citation
Deng, L., Mayusoh, C., Inkuer, A., & Suwannatat, P. (2025). The Application of Sensory Teaching Aids in Art Therapy for Children with Autism Spectrum Disorder (ASD). International Journal of Sociologies and Anthropologies Science Reviews, 5 (5), 1109-1120; DOI: https://doi.org/10.60027/ijsasr.2025.8306

International Journal of Sociologies and Anthropologies Science Reviews
Volume 5 Issue 5: September-October 2025: ISSN 2985-2730
Website: https://so07.tci-thaijo.org/index.php/IJSASR/index

Conceptual Framework

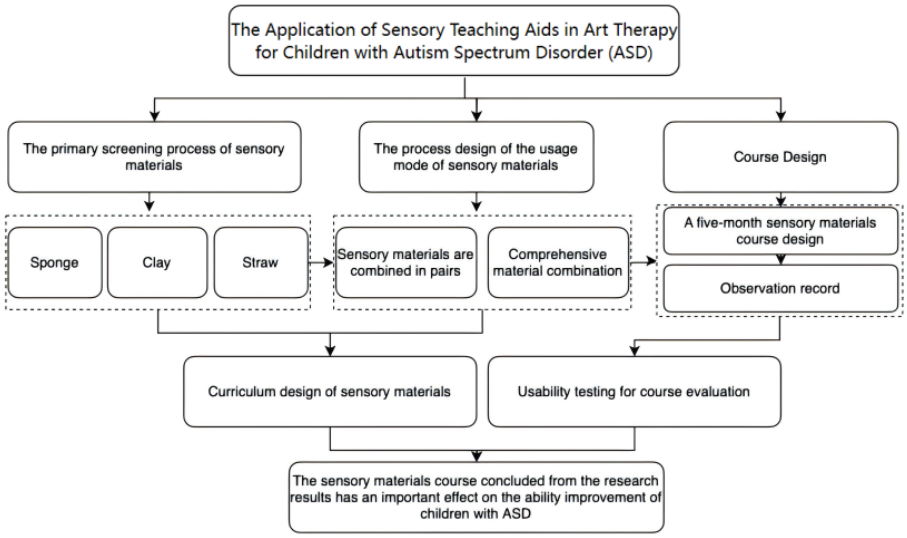


Figure 1: Conceptual Framework
Note: Constructed by the researcher

Methodology

This study employed a convergent mixed-methods design to ensure scientific rigour in the development and evaluation of sensory-material teaching aids for art therapy with children with Autism Spectrum Disorder. Thirty pupils aged six to nine years were recruited from three special-education primary schools in Guangdong Province, and ten practising art therapists implemented a five-month, sixty-session programme built around clay, straw, and sponge activities. Immediately after the final session, the therapists completed the ten-item System Usability Scale through an online link; their scores were averaged to obtain the programme's overall usability index, thereby integrating quantitative usability metrics with qualitative field observations and expert feedback.

1. Literature review method

The literature review method is a method of systematically combing and analyzing the theoretical basis, existing practices, and research progress in related fields. In this study, this method was used to comprehensively sort out the theoretical and practical results of sensory materials, art therapy, and teaching tool development at home and abroad. By focusing on identifying the core principles of effective art therapy and the problems of existing sensory material applications, the study provides a solid theoretical support and practical reference for subsequent tool development and course design. The study also combines the relevant theories of art therapy and positive psychology, systematically examines the neuropsychological mechanisms and positive psychological intervention strategies of sensory materials in art therapy, and provides a theoretical anchor for tool development**.**

2. Comparative analysis method

The comparative analysis method is a method of analyzing the characteristics, applicable populations, and effect differences by comparing different theoretical schools, existing tool models, and case studies. In this study, this method was used to deeply examine the application characteristics of different sensory materials in art therapy and to compare the advantages and disadvantages of different teaching tool design concepts. By comparing the applicable scenarios of existing tools horizontally, the study identified design problems and provided a basis for developing more targeted and effective localized tools and curriculum plans.

3. Questionnaire survey method

Citation
Deng, L., Mayusoh, C., Inkuer, A., & Suwannatat, P. (2025). The Application of Sensory Teaching Aids in Art Therapy for Children with Autism Spectrum Disorder (ASD). International Journal of Sociologies and Anthropologies Science Reviews, 5 (5), 1109-1120; DOI: https://doi.org/10.60027/ijsasr.2025.8306

The questionnaire survey method was employed to gather in-depth qualitative insights from the primary users of the sensory teaching aids. In total, 30 children with ASD, their 10 classroom teachers, and 10 art therapists who implemented the programme in three Guangdong special-education primary schools were invited to participate. An open-ended, semi-structured questionnaire was distributed immediately after the fifth and tenth weeks of intervention via printed forms for staff and pictorial cards for students; completed responses were returned to a sealed collection box in each classroom. This ensured confidential, context-rich feedback on material usability, course relevance, and unmet needs, which directly informed iterative refinements of the tools and curriculum.

4. Usability scale

The usability scale is a mature, efficient, and reliable quantitative evaluation tool used to quantify the ease of use, efficiency, and satisfaction of the evaluation tool. In this study, the target users were asked to complete a standardized SUS questionnaire (containing 10 Likert-type questions) after using the tool, and the study obtained a quantitative usability score. These data are used to evaluate the usability, efficiency, and user satisfaction of the tool, and to identify specific directions for improvement. As a standardized tool, the System Usability Scale (SUS) is known for its efficiency and reliability. In this study, it is used to measure the perceived usability of the teaching tool prototype and quantify it through the test data of the expert group.

5. Likert scale method

The Likert scale method is an attitude measurement method that converts the user's subjective feelings into statistically analyzable data in the form of a scale. In this study, the method uses a 5-point scale to evaluate the satisfaction of course participants on dimensions such as "activity participation" and "emotional relief effect". By converting subjective feelings into objective data, the study can objectively evaluate the effectiveness and acceptance of the course design, thereby further optimizing the course content and teaching methods.

Through the comprehensive application of the above research methods, this study not only systematically sorted out the application of sensory materials in art therapy at the theoretical level, but also verified the effectiveness of the developed teaching tools and course design at the practical level, providing a scientific basis and practical guidance for the education and treatment of ASD children.

Results

1. Development of Sensory Material Teaching Tools for ASD Children in Special Elementary Schools in Guangdong Province

1.1 Screening for optimal sensory material

The selection of sensory materials plays a key role in promoting fine motor development (e.g., muscle strength, fine motor, and hand-eye coordination) in art therapy programs for children with mild to moderate autism spectrum disorders (ASD). A fuzzy comprehensive evaluation method was applied to screen the optimal two-by-two combination program from five materials (clay, straws, sponges, knots, and beads) based on expert assessment and quantitative analysis. The screening basis includes:

(1) Functional impacts such as enhancement of muscle strength by clay+knot and straw+knot, fine motor facilitation by clay+straw, and enhancement of hand-eye coordination by sponge+straw;

(2) Core design principles, i.e., safety (weight 0.5 to ensure non-toxicity and no risk of swallowing), malleability (weight 0.3 to accommodate different levels of hand function), and controllability (weight 0.2, e.g., hardness grading of the clay);

(3) Material properties such as reusability and multisensory stimulation strength.

The scoring data came from two questionnaire evaluations by 10 experts (using Richter's 5-point scale) and a fuzzy composite evaluation of 40 valid questionnaires.

The statistical results show that the results of the distribution of the scores for safety, plasticity, and controllability is shown in Table 1:

Citation
Deng, L., Mayusoh, C., Inkuer, A., & Suwannatat, P. (2025). The Application of Sensory Teaching Aids in Art Therapy for Children with Autism Spectrum Disorder (ASD). International Journal of Sociologies and Anthropologies Science Reviews, 5 (5), 1109-1120; DOI: https://doi.org/10.60027/ijsasr.2025.8306

International Journal of Sociologies and Anthropologies Science Reviews
Volume 5 Issue 5: September-October 2025: ISSN 2985-2730
Website: https://so07.tci-thaijo.org/index.php/IJSASR/index

Table 1: Statistical table of the distribution of scores for sensory material evaluation indicators

Evaluation indicators	Very good (%)	Good (%)	Fair (%)	Poor (%)	Very poor (%)
safety	15	25	30	25	5
malleability	15	25	30	20	10
controllability	5	20	50	10	15

This data distribution provides a quantitative basis for the subsequent fuzzy comprehensive evaluation and material combination screening. Eventually, through weighted analysis, the optimal combination schemes were AB (clay + sponge), AC (clay + straw), BC (sponge + straw), BE (sponge + knot), and CE (straw + knot), with clay, sponge, and straw having the highest percentage due to their combined advantages in safety, plasticity, and controllability. Therefore, the three sensory materials of clay, sponge, and straw were chosen for the design of the teaching tools.

1.2. The process of using the three sensory material teaching aids singly and in combination is designed.

A three-stage progressive sensory teaching aid system is constructed to promote the neurobehavioral development of children with Autism Spectrum Disorder (ASD) through structured material stimulation. The design of the teaching aids is based on the theory of sensory integration and the principle of motor skill development ladder, which is divided into three stages: basic, elementary, and advanced, to realize the progression of ability:

1.2.1 Clay Teaching Aids

Basic Teaching Aids: Learning basic clay skills, kneading, rolling, pinching, pressing, from large to small changes through form scaling training, thus enhancing children's fingertip strength control.

Elementary Teaching Aids: Introduce colorful picture card matching to improve fine motor accuracy and color recognition.

Upgrading teaching aids: Advanced picture card forms include different colors, thicknesses, and shapes to further stimulate children's creativity and control of clay forms.

Table 2: Design of the Sensory Materials Clay Teaching Tool Use Processes

Materials	Difficulty of teaching aids	Content of Teaching Aid Design	Pictures	Teaching aids design instructions
Clay	Basic teaching aids	Capacity to be upgraded	Control of clay morphology	Clay increases in difficulty from large to small
		Design of teaching aids		
		Capacity to be upgraded	Force control, fingertip power	
		Design of teaching aids (snowflakes)		
	Elementary teaching aids	Capacity to be upgraded	Control of clay forms, fine finger movements	Simple graphic card morphology: color differentiation of graphic cards
		Design of teaching aids (basic picture cards)		
		Showcase of results		
	Upgraded props	Capacity to be upgraded	Control of clay forms, fine finger movements, and creativity	Advanced Toucan

Citation
Deng, L., Mayusoh, C., Inkuer, A., & Suwannatat, P. (2025). The Application of Sensory Teaching Aids in Art Therapy for Children with Autism Spectrum Disorder (ASD). International Journal of Sociologies and Anthropologies Science Reviews, 5 (5), 1109-1120; DOI: https://doi.org/10.60027/ijsasr.2025.8306

International Journal of Sociologies and Anthropologies Science Reviews
Volume 5 Issue 5: September-October 2025: ISSN 2985-2730
Website: https://so07.tci-thaijo.org/index.php/IJSASR/index

Materials	Difficulty of teaching aids	Content of Teaching Aid Design	Pictures	Teaching aids design instructions
		Design of teaching aids (Advancement chart card)		morphology: the difference between color, thickness, and shape differences
		Showcase of results		

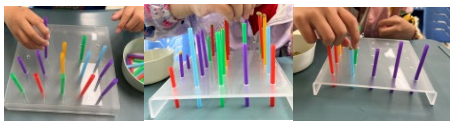
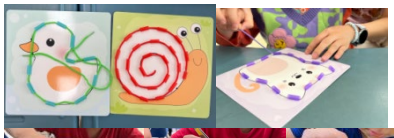
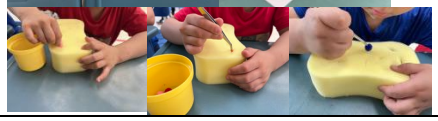
1.2.2. Straw-based teaching aids

Basic teaching aids: Straws are used as basic teaching aids, mainly for training fine finger movements. Simple tasks such as threading can help children enhance finger dexterity.

Elementary teaching aids: The straw threading task is designed with more color-matching and free-choice tasks to enhance children's color perception and coordination of hands.

Upgrading aids: Increase the difficulty of the straw threading task to enhance children's creativity and fine manipulation skills.

Table 3 Design of the Sensory Materials Straw Teaching Tool Use Processes

Materials	Difficulty of teaching aids	Content of Teaching Aid Design	Pictures	Teaching aids design instructions
Straw	Basic teaching aids	Capacity to be upgraded	Improve finger pinching and hand-eye coordination.	Insert the straw precisely into the hole.
		Design of teaching aids (Acrylic hole board)		
	Elementary teaching aids	Capacity to be upgraded	Simple difficulty: Fine motor skills, hand-eye coordination, and hand-to-hand coordination.	The task is to freely thread the straws and arrange the colors.
		Tool design (Rope)		
	Upgraded props	Capacity to be upgraded	Improve finger pinching and hand-eye coordination.	It has fixed threading tasks for straws and cartoon shapes, ranging from easy to hard. It also has different colored straws to enhance creativity.
		Design of teaching aids (Straw chart card)		
		Showcase of results		
		Tool design (Tweezer Assist)		

Citation
Deng, L., Mayusoh, C., Inkuer, A., & Suwannatat, P. (2025). The Application of Sensory Teaching Aids in Art Therapy for Children with Autism Spectrum Disorder (ASD). International Journal of Sociologies and Anthropologies Science Reviews, 5 (5), 1109-1120; DOI: https://doi.org/10.60027/ijsasr.2025.8306

International Journal of Sociologies and Anthropologies Science Reviews
Volume 5 Issue 5: September-October 2025: ISSN 2985-2730
Website: https://so07.tci-thaijo.org/index.php/IJSASR/index

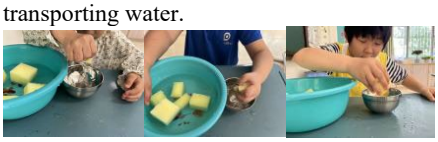
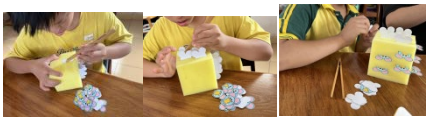
1.2.3. Sponge teaching aids

Basic teaching aids: sponges are used as basic teaching aids for water transportation tasks to enhance grip strength

Elementary teaching aids: tasks such as inserting and removing snowflakes further enhance children's fine motor skills of the fingers and coordination of the hands. The different sides of the sponge are manipulated to increase children's sensory experience.

Upgraded teaching aids: more pressing force tasks are introduced, such as pressing different geometric shapes of cardboard, gradually improving children's fine motor control.

Table 4 Design of the Sensory Materials Straw Teaching Tool Use Processes

Materials	Difficulty of teaching aids	Content of Teaching Aid Design	Pictures	Teaching aids design instructions
Sponge	Basic teaching aids	Capacity to be upgraded	Sponges improve grip strength by transporting water.	Utilizes the firmness of the sponge to train the student's palm grip while the sponge provides a tactile experience.
		Design of teaching aids (water, trays)		
		Capacity to be upgraded	Insert and remove the snowflake pieces. Fine motor skills and hand-eye coordination	Precisely locate the position of the insert and pull it out, exercising the ability to visually guide the movement.
		Tool design (snowflakes)		
	Elementary teaching aids	Capacity to be upgraded	Adjust the strength and precise positioning, exercise hand-eye coordination, and movement control	The gradual increase in difficulty from direct use of the hands to the use of tools and the integration of touch, vision, and movement promotes the integration of neural networks in the child's brain.
		Tool design (aided by wooden tweezers)		
	Upgraded props	Capacity to be upgraded	From direct hand to tool use, using tweezers requires greater fine motor control (e.g., three-finger pinch, strength adjustment)	Use finger pinching as a base, and then introduce the use of tweezers and other tools to further strengthen the pinching ability of fingers.
		Tool design (tweezers assisted)		
		Capacity to be upgraded	Palm Press Strength	From simple geometry to creating new patterns in cardstock
		Design of teaching aids (Skeletonized cardboard)		

1.2.4 Combination of Sensory Materials Teaching Aids

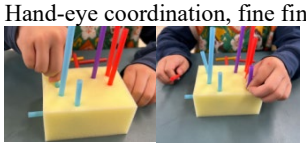
The combination of sensory materials is utilized in the final creation session of the course, which effectively promotes the multifaceted development of children with ASD through the combination of multi-level sensory stimulation and fine motor training. Based on single-material training, combining clay, straws, sponges, and other materials (Table 5) can realize the synergistic development of abilities: for example, combining clay and straws strengthens hand-eye coordination and fine-motor training; combining sponges and straws improves finger control; and combining clay and sponges stimulates creative thinking. Through

Citation
Deng, L., Mayusoh, C., Inkuer, A., & Suwannatat, P. (2025). The Application of Sensory Teaching Aids in Art Therapy for Children with Autism Spectrum Disorder (ASD). International Journal of Sociologies and Anthropologies Science Reviews, 5 (5), 1109-1120; DOI: https://doi.org/10.60027/ijsasr.2025.8306

International Journal of Sociologies and Anthropologies Science Reviews
Volume 5 Issue 5: September-October 2025: ISSN 2985-2730
Website: https://so07.tci-thaijo.org/index.php/IJSASR/index

progressive task design, these combined teaching aids not only consolidate basic motor skills but also lay the foundation for the development of higher-order abilities, and at the same time, allow children to gain a sense of achievement in completing the tasks and enhance their self-confidence.

Table 5: Methodology and process of creating combined sensory materials teaching aids

Materia l	Mater ia 2	Content and name of teaching aids design	Pictures
Clay	Straw	Capacity to be upgraded Inserting straws in clay Inserting twisters into straws	Inserting a straw requires controlled strength (too hard will flatten the clay, too light won't fit), exercising finger and wrist coordination, and strength control. 
Sponge	Straw	Capacity to be upgraded Kidney bean Capacity to be upgraded Stick a straw in the sponge.	Fine hand movements from large to small, hand-eye coordination  Hand-eye coordination, fine finger movements 
Sponge	Clay	Capacity to be upgraded decorative painting	Creativity, pressing power, and fine hand movements 
Three material combinations		Capacity to be upgraded three-dimensional ornament	Integrates children's fine motor skills, 3D spatial perception, tactile discrimination, creativity, and problem-solving skills. 

With the above hierarchical design of teaching aids, children with ASD can progressively develop their fine motor control, coordination, creativity, and problem-solving skills at different stages. Each tool is designed around the principle of "simple to complex" to ensure that each step of the child's development is precisely supported and guided. Ultimately, all of the sensory materials are designed to allow children with ASD to have fun, enhance their multi-sensory abilities, and stimulate their creative potential.

2. Evaluation of the Effectiveness and Applicability of Sensory Material Teaching Tools in Real-World Educational Settings

After completing the design of the Sensory Materials Straw Teaching Tool, the researcher constructed a five-month evidence-based intervention system for Sensory Materials Art Therapy, using clay, straws, and sponges as the core media, and intervening with students with ASD through a three-phase progressive program to gradually improve fine hand movements and concentration. It is divided into Adaptation and Exploration, Skills Enhancement, and Comprehensive Application and Expansion. In the first phase, students gradually familiarize themselves with these materials through simple activities such as kneading clay, grasping straws, and squeezing sponges to improve their fine motor and concentration skills. The second phase further hones students' manipulative skills and creativity through more challenging tasks, such as clay modeling, beading straws, and sponge painting. Stage 3 focuses on complex creations, such as

Citation
Deng, L., Mayusoh, C., Inkuer, A., & Suwannatat, P. (2025). The Application of Sensory Teaching Aids in Art Therapy for Children with Autism Spectrum Disorder (ASD). International Journal of Sociologies and Anthropologies Science Reviews, 5 (5), 1109-1120; DOI: https://doi.org/10.60027/ijsasr.2025.8306

International Journal of Sociologies and Anthropologies Science Reviews
Volume 5 Issue 5: September-October 2025: ISSN 2985-2730
Website: https://so07.tci-thaijo.org/index.php/IJSASR/index

integrated art projects and the creation of works combining clay and sponge, to consolidate students' skills and enhance their imagination.

2.1 Building an art therapy program

Constructed a sensory material art therapy lesson plan based on changes in children's abilities when using sensory material props by 10 previous experts. Design a five-month art therapy session scheduling planner for students with autism to enhance fine hand movement and concentration through three sensory materials: clay, straws, and sponges. Sessions were held three times per week with a recommended length of 30 minutes per session. The design of the program follows the principle of gradual progression from easy to difficult, while focusing on fun and interactivity to stimulate students' participation.

(1) Stage 1: Adaptation and Exploration (Month 1-2)

The objectives of the first stage are to familiarize students with the materials and to initially improve their fine hand movements and concentration.

(2) Stage 2: Skill Enhancement (Months 3-4)

The objectives of the second stage are to increase the difficulty of the production content, further enhance the fine hand movements, and concentration.

(3) Stage 3: Comprehensive Application and Expansion (Month 5)

The goal of the third stage is to consolidate the skills, complete a complete work with the skills learned through the sensory material teaching tools, enhance concentration, and stimulate creativity.

Stage 1: Adaptation and exploration (months 1-2)

Objective: To familiarize students with the material and initially improve their fine motor skills and concentration.

Weeks	course content	material	target	Activity description	picture presentation
Week 1	Welcome and introduction	not have	Be familiar with the environment and rules	Explain the course objectives, introduce the materials, and do a simple finger exercise to warm up.	
Week 2	Clay foundation	clay	Familiarize yourself with clay, learn to roll it into a long strip and exercise your hand strength	Let the students knead the clay freely and make a ball with their hands. Put the ball into a sealed bag and press and tap it. (Use the clay ball combined with snowflake pieces to simulate making a sandwich cookie)	
Week 3	Sippy exploration	tubular is	Improve hand flexibility	Ask the student to try to pick up the straw with his thumb and forefinger and stick it into the clay.	
Week 4	Spongebob Squarepants	sponge	Improve hand tactile sensitivity and large grip ability	1.Cut the sponge into small pieces and let the students grab and squeeze the sponge with their fingers to feel different textures. 2. Plug the snowflake pieces into the sponge and let the students pull them out.	
Week 5	comprehensive exercises	Clay, straws, sponges	Use materials in combination	Insert the straw into the clay block, take the clay ball and sponge on the straw.	
Week 6	results show	not have	Boost your confidence	Students try to complete the work alone, and art therapists observe their progress	

Stage 2: Skill enhancement (months 3-4)

Goal: The difficulty of making content increases, further improving the fine movements of the hands and enhancing concentration.

Weeks	course content	material	objective	Activity description	picture presentation
Week 7	Knead the clay	clay	Improve fine motor skills in the hands	When rubbing the long strip, pay attention to the uniform size. When rubbing the small strip, use your fingers.	
Week 8	Suction tube through wound	tubularis	Improve hand flexibility and concentration	Provide a straw jigsaw puzzle template and let the students assemble the straws according to the template. (Thread the straws on the necklace, thread the straws on the picture card)	
Week 9	Sponge painting	Sponge pigment	Improve hand control	Cut the sponge into different shapes and use the sponge dipped in paint to create paintings.	
Week 10	Integrated creation	Clay straws	Use materials to enhance creativity	Creative clay painting (doughnut)	
Week 11	loam molding	clay	Improve fine motor skills in the hands	Guide students to make simple clay shapes (such as geometric shapes) by using clay cards.	
Week 12	Syringe and sponge combination	Sponge straws	Improve hand coordination	Make a craft with a straw and a sponge. Insert the straw into the sponge.	
Week 13	Review the knowledge and results of this cycle	not have	Boost your confidence	Students try to complete the work alone, and art therapists observe the results of their learning	

Stage 3: Comprehensive application and expansion (5 months)

Goal: Build skills, focus and creativity.

Weeks	course content	material	target	Activity description	picture presentation
Week 14	loam molding	clay	Improve hand dexterity and creativity	Guide students to make simple clay shapes (such as sun, cloud, fruit and other biomimetic graphics in life) through clay picture cards.	
Week 15	Sipper stand beans	tubularis	Improve hand flexibility and concentration	Insert the straw into the clay block, hold the clay ball or bean on the straw with two or three fingers without dropping it. The cotton swab is inserted into the straw.	
Week 16	The Sponge Bunker	sponge	Improve hand dexterity and control	From a ball of wool to a straw to a bean stuffed into a sponge block, students first use their hands and then use tweezers to find treasure in the sponge.	
Week 17	Integrated arts projects	Clay straw sponge	Use materials to enhance creativity	Students make lollipops out of clay and stick them on a sponge to create a lollipop display area	
Week 18	Clay and sponge combined	Clay sponge	Improve hand coordination	Make a work that combines clay and sponge (such as clay flowers and sponge leaves).	
Week 19	Sippy tube idea	tubularis	Improve hand flexibility and creativity	Create creative works with straws.	
Week 20	Work presentation and sharing	not have	Boost your confidence and social skills	Show students work, invite parents to participate, and share the creative process.	
Week 21	Course summary	not have	Review and summary	Review the course content and share students learning achievements and growth.	
Week 22	Graduation celebration	not have	Celebration and encouragement	A small graduation celebration was held, certificates were awarded and students were encouraged to continue exploring artistic creation.	

Figure 2 Sensory Materials Course Program Schedule
Note: Constructed by the researcher

This lesson plan helps students with autism make progress in art therapy and improve fine motor hand movement and concentration.

2.2 SUS usability testing

For the research on the construction of art therapy process models, its effectiveness was initially verified through usability testing, and to ensure the effectiveness of the error correction and optimization design scheme, the rationality of the use of the art therapy process was further improved based on direct and auxiliary feedback for usability testing to assess the rationality of the scheme.

Analysis of the art therapy practitioner questionnaire showed that of the 10 respondents (4 males and 6 females, 24-43 years old), 70% had experience in implementing new programs, 50% had been involved in process optimization, and only 30% had experience in process construction, with the latter mostly being done by highly qualified practitioners. The data suggest that innovation is more prevalent in art therapy, but systematic process design is still a specialized higher-order competency.

Citation
Deng, L., Mayusoh, C., Inkuer, A., & Suwannatat, P. (2025). The Application of Sensory Teaching Aids in Art Therapy for Children with Autism Spectrum Disorder (ASD). International Journal of Sociologies and Anthropologies Science Reviews, 5 (5), 1109-1120; DOI: https://doi.org/10.60027/ijsasr.2025.8306

International Journal of Sociologies and Anthropologies Science Reviews
Volume 5 Issue 5: September-October 2025: ISSN 2985-2730
Website: https://so07.tci-thaijo.org/index.php/IJSASR/index

Table 6 Scale questions

1. The activities in this course are very easy to understand.	1 2 3 4 5
2. The activities in this course are very difficult to understand.	1 2 3 4 5
3. The materials in the course (e.g., clay, straws, sponges) are easy to use.	1 2 3 4 5
4. The materials in the course (e.g., clay, straws, sponges) are not easy to use.	1 2 3 4 5
5. I find that children become more skillful through the lessons.	1 2 3 4 5
6. I find that children's manipulative proficiency has not changed through the course.	1 2 3 4 5
7. The art-making activities in the curriculum give children a sense of accomplishment.	1 2 3 4 5
8. The art-making activities in the curriculum gave children a weak sense of accomplishment.	1 2 3 4 5
9. I think the curriculum is moderately difficult.	1 2 3 4 5
10. I think the curriculum was harder/easier.	1 2 3 4 5

The psychotherapists who participated in this study were labeled as Respondent 1, Respondent 2, etc. During the testing process, they scored each question based on their experience and optimized the system design accordingly to better meet user needs.

The researcher divided the scores (F) into three levels: F<50 is unacceptable, 50≤F<70 is acceptable, and F≥70 is satisfactory.10 The psychotherapists scored the system through their experience to provide a basis for system optimization.

Table 7 SUS scale scoring data

Question	**Test subject**									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Q1	3	5	3	5	4	4	4	5	4	4
Q2	3	2	2	2	2	2	3	2	2	2
Q3	3	4	4	4	3	4	5	4	3	4
Q4	3	2	2	3	3	3	2	3	3	3
Q5	5	4	4	4	4	4	5	4	3	4
Q6	1	2	2	2	1	2	2	2	2	2
Q7	4	4	3	4	4	3	3	4	3	3
Q8	3	2	1	1	1	2	2	2	2	2
Q9	4	4	4	4	4	4	3	4	5	5
Q10	2	2	1	1	2	2	2	2	2	1
Sus	69	77.5	76.5	70.5	72.5	73.5	67.5	70	67	76.5
Overall average	**72.05**									

Calculated from the SUS scale and totaling the scores of the ten subjects, the art therapy program sought a usability SUS mean of 72.05.

Demonstrate that the usability rating scores for the sensory material teaching aids program design are high and that this form of art therapy is effective in intervening with children with ASD.

Discussion

1. Development of Sensory Material Teaching Tools for ASD Children

Aligned with Barton et al. (2018) and Case-Smith et al. (2015), who demonstrate that modelling clay and kinetic sand enhance fine-motor precision in children with ASD, this study advances prior single-material investigations by systematically integrating clay, straws, and sponges into a three-stage, progressive teaching-aid system. Designed in consultation with ten practising art therapists and validated through iterative classroom trials in three Guangdong special-education primary schools, the tools meet

Citation
Deng, L., Mayusoh, C., Inkuer, A., & Suwannatat, P. (2025). The Application of Sensory Teaching Aids in Art Therapy for Children with Autism Spectrum Disorder (ASD). International Journal of Sociologies and Anthropologies Science Reviews, 5 (5), 1109-1120; DOI: https://doi.org/10.60027/ijsasr.2025.8306

safety, malleability, and controllability criteria established by Pfeiffer et al. (2020), thereby offering a rigorously tested, empirically grounded intervention that strengthens hand-muscle tone, fine-motor dexterity, and hand-eye coordination more comprehensively than earlier, non-integrated approaches.

2. Evaluation of the Effectiveness and Applicability of Sensory Material Teaching Tools

The results of the System Usability Scale (SUS) evaluation indicate a high level of satisfaction with the developed sensory material teaching tools. This finding is consistent with previous research that has highlighted the benefits of sensory materials in improving fine motor skills and hand-eye coordination in children with ASD. For instance, a study by Case-Smith et al. (2015) found that the use of sensory materials such as clay and kinetic sand can significantly enhance fine motor skills and hand-eye coordination in children with ASD. The current study builds on this research by providing a more systematic and comprehensive evaluation of the effectiveness and applicability of sensory material teaching tools in real educational settings.

However, there are also some inconsistencies compared to previous findings. While some studies have focused on the emotional and social benefits of sensory materials in art therapy, this study has placed a greater emphasis on the development of fine motor skills and hand-eye coordination. This shift in focus highlights the importance of addressing the specific needs of ASD children in educational settings and provides a more targeted approach to intervention. Additionally, the study has identified that the effectiveness of sensory material teaching tools can vary depending on the specific materials used and their combination. This finding suggests that further research is needed to explore the optimal combinations of sensory materials for different groups of children with ASD. Overall, the current study has made a valuable contribution to the field by providing empirical evidence of the effectiveness of sensory material teaching tools and offering practical guidance for their use in real educational scenarios.

Conclusion

The present research has significantly advanced the field of art therapy for children with Autism Spectrum Disorder (ASD). A targeted and systematic suite of teaching aids, incorporating the sensory materials of clay, straws, and sponges, has been meticulously developed to align with the unique sensory profiles of ASD children within special elementary school settings in Guangdong Province. This innovative set of tools constitutes a three-stage progressive sensory teaching aid system, which has demonstrated efficacy in bolstering hand muscle strength, fine motor abilities, and hand-eye coordination among children with ASD.

In addition to development, the research has also rigorously evaluated the practical utility of these tools. Empirical validation via the System Usability Scale (SUS) has confirmed their effectiveness and applicability in authentic educational environments. The study has thus established the high usability of art therapy programs grounded in these sensory materials, offering an original and effective strategy for enhancing fine motor skills and hand-eye coordination in children with ASD. Overall, the research not only provides profound insights into the application of sensory materials in art therapy for this population but also delivers practical guidance that can be utilized by educators and therapists in real-world settings, marking a substantial step forward in the understanding and employment of sensory materials within the domain of art therapy for children with ASD.

Recommendation

The current research landscape indicates that while there is a growing body of literature on art therapy and sensory materials, further refinement is needed. It is recommended that future research concentrate on the systematic integration of sensory materials to provide a more comprehensive understanding of their application in art therapy for children with ASD. Policies should be developed to support the creation and dissemination of specialized teaching tools designed for children with special educational needs, ensuring that these resources are accessible to educational institutions and therapeutic settings.

Citation
Deng, L., Mayusoh, C., Inkuer, A., & Suwannatat, P. (2025). The Application of Sensory Teaching Aids in Art Therapy for Children with Autism Spectrum Disorder (ASD). International Journal of Sociologies and Anthropologies Science Reviews, 5 (5), 1109-1120; DOI: https://doi.org/10.60027/ijsasr.2025.8306

Future studies could explore the long-term effects of sensory material-based art therapy on children with ASD, including its impact on emotional regulation and social interaction skills. Additionally, further research could examine the application of these teaching tools across different cultural contexts to determine their adaptability and effectiveness for diverse populations. Moreover, the potential of combining sensory materials with emerging technologies, such as virtual reality or smart devices, could be investigated to enhance the therapeutic experience and outcomes for children with ASD.

References

Asmika, A., Oktafiani, L. D. A., Kusworini, K., Sujuti, H., & Andarini, S. (2018). Autistic children are more responsive to tactile sensory stimuli. *Iranian Journal of Child Neurology, 12*(4), 37.

Barton, E. E., Reichow, B., Wolery, M., & Chen, C. (2018). The effect of playdough on the fine motor skills of preschoolers with autism spectrum disorders. *Journal of Autism and Developmental Disorders, 48*(4), 1239–1250.

Case-Smith, J., Weaver, L. L., & Fristad, M. A. (2015). A systematic review of sensory processing interventions for children with autism spectrum disorders. *Autism, 19*(2), 133–148.

Cho, J. (2021). A study of multi-sensory experience and color recognition in visual arts appreciation of people with visual impairment. *Electronics, 10*(4), 470.

Ghazali, R., Sakip, S. R., & Samsuddin, I. (2018). The effects of sensory design on autistic children. *Asian Journal of Behavioural Studies, 3*(14), 68–83.

Jones, L. M., & Thompson, R. A. (2019). Sensory-based art interventions in clinical practice: A systematic review. *Art Therapy: Journal of the American Art Therapy Association, 36*(2), 78–85.

Lee, H., & Park, S. (2020). The role of sensory materials in reducing anxiety in children with ASD during art therapy. *International Journal of Art Therapy, 25*(2), 99–112.

Lee, S., Park, H., & Kim, J. (2020). Efficacy of multisensory art materials in reducing anxiety among children with developmental disorders. *Journal of Clinical Psychology, 76*(4), 1023–1035.

Pfeiffer, B., Clark, G. F., & Arbesman, M. (2020). Effectiveness of sensory integration interventions for children with autism spectrum disorder: A systematic review. *American Journal of Occupational Therapy, 74*(2), 7402205040. https://doi.org/10.5014/ajot.2020.039545

Unwin, K. L., Powell, G., Price, A., & Jones, C. R. (2024). Patterns of equipment use for autistic children in multi-sensory environments: Time spent with sensory equipment varies by sensory profile and intellectual ability. *Autism, 28*(3), 644–655.

Wan, Y., Hu, Q., Li, T., Jiang, L., Du, Y., Feng, L., & Li, C. (2021). Prevalence of autism spectrum disorders among children in China: A systematic review and meta-analysis. *Frontiers in Psychiatry, 12*, 691148. https://doi.org/10.3389/fpsyt.2021.691148

Zhou, H., Xu, X., Yan, W., Zou, X., Wu, L., Luo, X., ... Hao, Y. (2020). Prevalence of autism spectrum disorder in China: A nationwide multi-center population-based study among children aged 6 to 12 years. *Neuroscience Bulletin, 36*(9), 961–971. https://doi.org/10.1007/s12264-020-00544-8

Citation
Deng, L., Mayusoh, C., Inkuer, A., & Suwannatat, P. (2025). The Application of Sensory Teaching Aids in Art Therapy for Children with Autism Spectrum Disorder (ASD). International Journal of Sociologies and Anthropologies Science Reviews, 5 (5), 1109-1120; DOI: https://doi.org/10.60027/ijsasr.2025.8306