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INVESTIGACIONES

Performing the opportunity space of therapeutic art education for autistic children

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ENG **Abstract:** This research aims to explore expressive art approaches to enhance communication in autistic children in opportunity space settings. The study discusses the process of therapeutic exploration in an online-based practice and how the space setting plays a significant role in this process. The research methodology involves a mixed-method approach, including case studies conducted at TT-ArtCourse in Yogyakarta, Indonesia, and a questionnaire to determine parents' responses to the influence of the spatial setting. The study shows that online treatment has initial challenges in adaptation time for parents, teachers, and autistic children. The main obstacle is the lack of intimacy, which is crucial in face-to-face interactions. However, in the end, parents can see the effectiveness of the online mode, allowing them to set up their treatment room according to their child's wishes. The study also found that the communication processes in the online-based opportunity space therapeutic ecosystem are similar to face-to-face schools.
Key words: art therapeutic ecosystem, autistic children education, opportunity space

ES Desempeñando el espacio de oportunidad de la educación artística terapéutica para niños autistas

Resumen: Esta investigación tiene como objetivo explorar enfoques de arte expresivo para mejorar la comunicación en niños autistas en entornos de espacio de oportunidad. El estudio aborda el proceso de exploración terapéutica en una práctica basada en línea y cómo el entorno espacial juega un papel significativo en este proceso. La metodología de investigación implica un enfoque de método mixto, incluyendo estudios de caso realizados en TT-ArtCourse en Yogyakarta, Indonesia, y un cuestionario para determinar las respuestas de los padres a la influencia del entorno espacial. El estudio muestra que el tratamiento en línea presenta desafíos iniciales en el tiempo de adaptación para padres, maestros y niños autistas. El principal obstáculo es la falta de intimidad, crucial en las interacciones cara-a-cara. Sin embargo, al final, los padres pueden ver la efectividad del modo en línea, lo que les permite configurar su sala de tratamiento según los deseos de su hijo. El estudio también encontró que los procesos de comunicación en el ecosistema terapéutico de espacio de oportunidad basado en línea son similares a las escuelas cara-a-cara.
Palabras clave: ecosistema terapéutico artístico, educación de niños autistas, espacio de oportunidad.

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1. Introduction

The emergence of contemporary issues has significantly impacted people with disabilities, including those with autism, making their daily activities more challenging and increasing their vulnerability. The United Nations has called for its members to develop measures to assist people with disabilities during these times (Simplican, 2019). *Autism* is a complex neurodevelopmental disorder that affects communication, social interaction and behaviour (Hadley & McDonald, 2019; T. Sampurno, 2015; Smagorinsky, 2016). Children with autism often have difficulty expressing themselves verbally, leading to frustration and isolation (Dinishak, 2019).

Therapeutic art education has emerged as a promising approach to help children with autism develop better communication skills, self-expression and creativity (M. B. T. Sampurno, 2023). However, despite the potential benefits, more research is still needed to explore the opportunity space of therapeutic art education for autistic children (Arendell, 2015; Lauffenburger, 2020; M. B. T. Sampurno, 2019). This is based on the phenomenon of the Internet of Things, which in turn opens up opportunities for online treatment. Despite the potential benefits of therapeutic art education for autistic children, the shift to online therapeutic space has created challenges in adapting activities to virtual settings (Assaf, 2020; Datlen & Pandolfi, 2020).

The recent massive technological change also affected autistic children and their facilitators, requiring discovering new ways to address the complexities of social isolation in autistic children, such as loneliness, worry, and sadness in the virtual world (Bayu Tejo Sampurno & Zaini, 2018; Dinishak, 2019; Douglas et al., 2021). Therefore, developing a therapeutic ecosystem integrated into online-based therapeutic practices is urgent to ensure the therapeutic process runs smoothly and effectively. In addition, the emergence of alternative spaces in education also needs to be explored in the world of education for autistic children. This is to see the opportunity that autistic children can be treated anywhere with online mode.

The lack of physical space and sensory input in virtual environments may limit the effectiveness of therapeutic interventions. Therefore, there is a need to explore how to create an opportunity space for therapeutic art education in online settings and optimize the virtual therapeutic space to meet the needs of autistic children better. This study explores the theoretical foundations of expressive art treatment that contribute to improving communication for autistic children through an artistic approach. Specifically, it will investigate how therapeutic exploration is carried out in online-based practice and how it triggers further development, considering the opportunity space involved. The shift of therapeutic practice from face-to-face to online mode has caused delays in developing therapeutic practices, including an arts approach, which requires adaptation, delivery, and new structures and systems (Friedner & Block, 2023; Karulkar et al., 2022).

By providing a theoretical framework for understanding the potential of therapeutic art education for autistic children, this research can inform the development of effective interventions that promote better communication, self-expression, and creativity among children with autism. The findings can also contribute to developing art approach space settings and models that increase independence and enhance the quality of life for autistic children. This study addresses contemporary issues, such as the negotiation of technology in daily life and contributes to art, health, technology and education by enriching therapeutic models for autistic children. It also highlights the importance of considering the context in which therapeutic practices are implemented and the need for continuity in research and theorizing about interdisciplinary approaches in the therapeutic practice of autistic children.

2. Method

This study utilized a mixed-methods design, incorporating both quantitative and qualitative data collection and analysis methods, as advocated by Leavy (2017). This approach was selected to theoretically explore the transition from conventional face-to-face expressive art treatment to an online modality, examining how this shift affects the system and setting of expressive arts treatment for autistic children.

For the qualitative aspect, in-depth semi-structured interviews were conducted with parents to evaluate the impact of the opportunity space during art education interventions on the communication, self-expression, and creativity skills of children with Autism Spectrum Disorder (ASD). This data collection aimed to gather rich, detailed insights into the experiences of both the children and their parents regarding the therapeutic art education intervention in the opportunity space. The interviews were audio-recorded, transcribed verbatim, and then analyzed. Quantitative data were collected post-intervention using a structured questionnaire. This questionnaire, specifically designed for this study, comprised questions related to the efficacy of the online program in enhancing communication, self-expression, and creativity in children with ASD. The questionnaire included both Likert-scale and open-ended questions to capture a comprehensive view of the parents' perspectives (Table 1).

Table 1. Parental Questionnaire on the Efficacy of Online Art Therapy Program for Children with Autism Spectrum Disorder (ASD)

Question Type	Question Number	Question	Response Options
Likert-Scale	1	How effective was the online program in improving your child's communication skills?	1 (Not effective at all) - 5 (Extremely effective)
Likert-Scale	2	To what extent has the program helped your child in self-expression?	1 (Not helpful at all) - 5 (Extremely helpful)

Question Type	Question Number	Question	Response Options
Likert-Scale	3	How much do you think the program has enhanced your child's creativity?	1 (No enhancement) - 5 (Significant enhancement)
Likert-Scale	4	How engaged was your child during the online art therapy sessions?	1 (Not engaged) - 5 (Highly engaged)
Likert-Scale	5	How easy was it for your child to use the online platform for the art therapy sessions?	1 (Very difficult) - 5 (Very easy)
Open-Ended	6	Please describe your overall experience with the online art therapy program. What did you find most beneficial for your child?	(Open text response)
Open-Ended	7	Were there any challenges or difficulties your child faced during the online sessions? If yes, please specify.	(Open text response)
Open-Ended	8	Do you have any suggestions on how the online art therapy program could be improved?	(Open text response)
Open-Ended	9	Have you noticed any changes in your child's behavior or skills since participating in the program?	(Open text response)
Open-Ended	10	If your child has previously participated in face-to-face art therapy, how do you compare the online to the face-to-face experience?	(Open text response)
Open-Ended	11	Would you be willing to enroll your child in similar online art therapy programs in the future? Why or why not?	(Open text response)
Open-Ended	12	Is there any other feedback or comments you would like to provide about the program, its impact on your child, or your role?	(Open text response)

Thirty children diagnosed with ASD, aged between 6 to 12 years old, participated in the study. These children were enrolled in TT-Art Therapy, a local community in Yogyakarta, Indonesia, offering therapeutic services for children with ASD. The intervention consisted of a 10-week online-based program, with weekly sessions lasting 90 minutes each. The program, tailored to the unique needs of children with ASD, involved various artistic activities such as drawing, painting, sculpting, and collage-making.

The collected data were analyzed using thematic analysis following the Hartmann and Malchiodi approach (Liu & Luton, 2011; Malchiodi & Crenshaw, 2014). This method involved coding the data, organizing it into themes, and interpreting the findings. Special attention was paid to reflexivity during the analysis to understand the context and nuances of the collected data thoroughly. The ethical considerations were rigorously adhered to throughout the research. The study received approval from an institutional review board, ensuring all research practices met ethical standards. Participants and their parents gave informed consent, and the confidentiality of their responses was maintained.

3. Findings and Discussion

3.1. Exploration of the art treatment ecosystem and sensory sensitivity

Mainstream autistic child treatment always runs in face-to-face mode (Matson, 2017; Schweizer et al., 2019). I referred to what Malchiodi said, that the best treatment for autistic children is to engage in direct interactions and activities (Malchiodi & Crenshaw, 2014). Nevertheless, on the other hand, Malchiodi's statement provides a gap, especially in the flexibility of modes carried out in treatment. If viewed from the perspective of a generation that autistic children also experience, considerations about online modes that collaborate on technological aspects must be carried out. Meanwhile, the process of online mode treatment for autistic children in Indonesia appears at a late stage (M. B. T. Sampurno, 2019). When compared to other countries in Southeast Asia, Indonesia occupies the final position. The use of technology is only carried out for reasons of government policies regarding crowd restrictions that suddenly impact the development of treatment in online modes (Handayani et al., 2020).

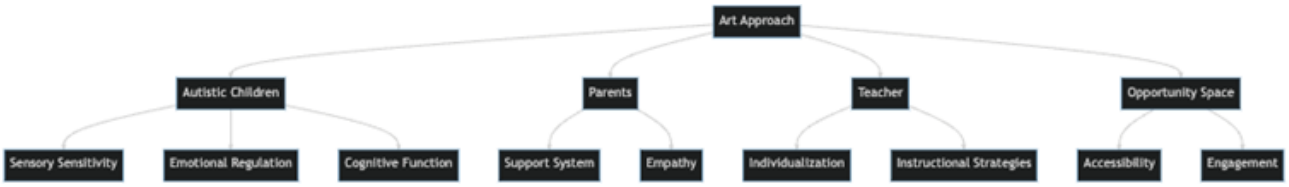

Figure 1. Relationship between Art Approach, Autistic Children, Parents, Teacher, and Opportunity Space

Initially, the policy and its implementation were interpreted negatively by teachers and parents of children with autism. They perceive that by doing online mode, the treatment process could be more optimal (Table 2). Teachers and parents have more attention to the effectiveness of art treatment for autistic children with

online modes (Figure 1). They focus on direct involvement in online modes that still need optimal. Direct involvement is indeed one of the main points in art treatment. When the online mode is used, communication occurs through virtual space mediation.

Table 2. Teacher and parents opinion on online treatment

Participant	Age	Role	Opinion
G1	45	Teacher	Shocked and confused about doing art treatment online. Many processes are missed, results not per program, treatment not optimal.
G2	38	Teacher	Mobile treatment offers flexibility and convenience for autistic children. Direct contact with parents is more important than direct contact with teachers in art treatment.
P1	48	Parents	Treatment using online mode is annoying, treatment not optimal, and does not match the teacher's instructions.
P2	40	Parents	Complaints about online-based treatment due to the teacher's absence of full control during the art treatment process. Everything is controlled by parents, which has limitations in the science of treatment.

Virtual space mediation in the context of art treatment is defined as two-layer communication. This causes a pause in communication between teachers and parents, which causes distraction, so the art treatment process is considered not optimal. The intended distraction is interpreted as a disturbing pause process, but rather complex distractions such as time, momentum, material, instructions, interaction, and communication. The emphasis on art treatment in a virtual space lies in the intimacy of a virtual space. From intimacy, distraction is disguised and exploration of sensory sensitivity.

Online art treatment in autistic children is feared to increase hypersensitivity and hyposensitivity to the environment. Up to 90% of children with autism are estimated to be affected by sensory atypicalities (Table 3). However, with the art treatment mode that has been carried out, the sensory sensitivity of autistic children is identified to be within the sensory threshold, where there is still visual acuity, sensitivity to light contrast, and auditory that do not interfere with the activities of autistic children (Bennett, 2020; van Leeuwen et al., 2020; Vincent & Fabri, 2020). This is based on the intimacy between autistic children and their companions (teachers and parents), which can indirectly stimulate the quality of sensory processing through empathy.

Table 3. Sensory Sensitivity of Autistic Children Before and After Online Art Treatment

Sensory Atypicality	Percentage of Autistic Children Affected	Impact of Online Art Treatment
Hypersensitivity	Up to 90%	Identified to be within sensory threshold
Hyposensitivity	Up to 90%	Identified to be within sensory threshold
Visual Acuity	–	Not affected by online art treatment
Sensitivity to Light Contrast	–	Not affected by online art treatment
Auditory Sensitivity	–	Not affected by online art treatment

The online mode art treatment concept involves the interplay between empathy and multi-inter-media. This relationship begins with the transition of the art treatment ecosystem for autistic children, where the online mode is referred to as the empathy space ecosystem. This transition involves the design of an art treatment ecosystem that integrates other fields and disciplines. Exploring this ecosystem involves creating physical and imaginary spaces for online art treatment activities through artistic expression (Figure 2).

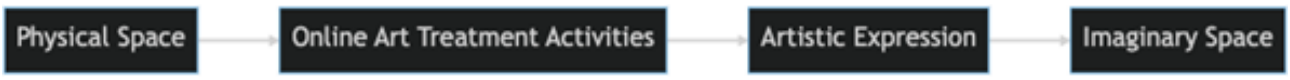

Figure 2. Physical and Imaginary Spaces for Online Art Treatment Activities through Artistic Expression

"Physical Space" represents the actual space where the online art treatment activities are taking place, such as a room in the child's home or a dedicated space in a therapy center. "Online Art Treatment Activities" refers to the specific activities being done as part of the treatment, which can include things like drawing, painting, or sculpture. "Artistic Expression" is the means by which the child expresses themselves through the art activities. "Imaginary Space" represents the mental and emotional space created by the child through their artistic expression. Moving from the physical to the imaginary space creates an environmental ecosystem that is continuously changing to provide new creative spaces in therapeutic activities that are inclusive and exclusive. This concept of ecology is instrumental in thinking about the function of the system and the environment in art treatment for children with autism as an ecosystem (Batey et al., 2021; Linton et al., 2015;

Thoring et al., 2018). The acceptance of space with the primary focus being the ecosystem; then the population (consisting of autistic children, teachers, and parents) is the primary component of the ecosystem, and virtual space empathy is the association of interacting ecosystems. The therapeutic ecosystem of empathy space can be compared to a complex ecosystem (as shown in Figure 3) to illustrate the interdependent nature of the components involved.

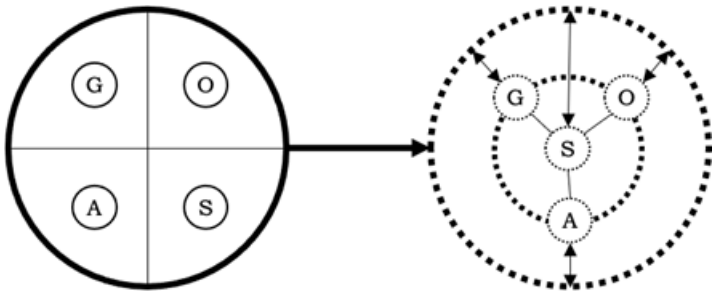

Figure 3. The transition of physical space to the imaginary and the elements that play in it

The art treatment ecosystem is a dynamic and innovative approach to enhancing creativity and therapeutic interventions for autistic children. The novel approach can improve communication and increase sensory sensitivity in autistic children, initially thought to be absent in online art treatment (van Leeuwen et al., 2020).

Perception and attention, which are crucial factors in autism, can be significantly improved through the empathy space ecosystem model (Zhou et al., 2022). As autistic individuals often exhibit a shift in attention to detail, this model can provide opportunities for intensive communication between autistic children and their companions. Additionally, the model facilitates global visual processing in autistic children, albeit requiring more time and effort to bring out their full potential to support the therapeutic process.

The art treatment ecosystem offers a valuable framework for enhancing communication, improving sensory sensitivity, and promoting global visual processing in autistic children through the empathy space ecosystem model (Durrani, 2021; Seok & Kwon, 2019; Xu, 2020). These findings have important implications for art education and therapeutic interventions for children with autism, and further research in this area is warranted.

3.2. Characteristics and Methods of online treatment communication

The relationship between schools and children with autism in the online therapeutic process is defined as a relationship with teachers who continuously provide support, a sense of belonging, intimacy with peers, engagement with therapeutic activities, and experiences with technology, all of which are fun-packed (Creed, 2018; Suparjoh et al., 2020)but there has been a lack of research investigating the impact of assistive digital tools in this context. This article explores the current practice of physically impaired visual artists and their experiences around the use of digital technologies. An online survey was conducted with professional disabled artists and followed up by face-to-face interviews with 10 invited artists. The findings illustrate the issues disabled artists experience in their practice and highlight how they are commonly using mainstream digital technologies as part of their practice. However, there is little awareness around novel forms of technology (e.g. eye gaze tracking. The relationship between autistic children's emotions and their online presence can be explained by theoretical constructs based on the characteristics of online-based empathy room therapeutic intermediality, which for some autistic children, induces boredom. Depression and excessive anxiety

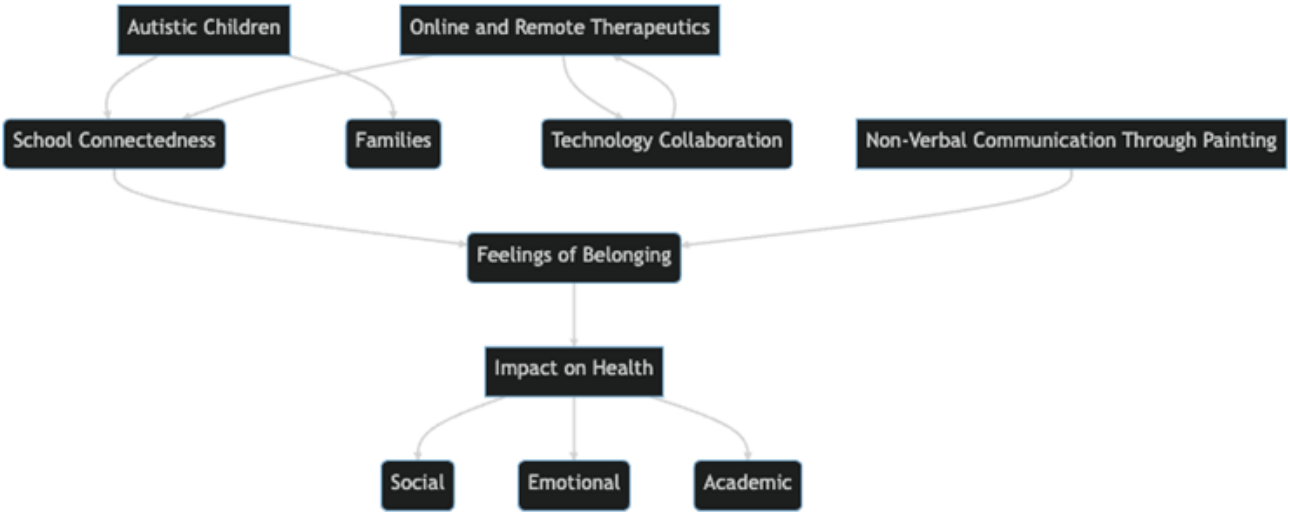

Figure 4. Factors Impacting the Effectiveness of Online Therapeutics for Autistic Children

develop in autistic children as a result of boredom. Children with autism have a higher medical and social risk of developing disorder-related complications (Bogen, 2016; Rapp et al., 2018), so the impact may be more pronounced.

Online and remote therapeutics pose a growing danger to autistic children, particularly when schools and instructors cannot collaborate on technology. Priority for autistic children through school connectedness involves feelings of autistic children and their families being part of the school community. Feelings of belonging are essential factors that impact health on a social, emotional, and academic level, which in this case is non-verbal communication through painting (Figure 4).

Table 4. Aspects that parents and teachers worry about in online treatment for autistic children

Interviewee	Age	Occupation	Key Points
P3	45	Parents	Autistic children may become dangerous if given gadgets for too long, and they do not understand the function of an object. Boredom can lead to depression and excessive anxiety.
G3	42	Teacher	Online treatment poses challenges in reducing tantrums due to the lack of intimacy compared to face-to-face treatment with teachers. Autistic children may have a different concept of teachers and parents.
P2	40	Parents	Online treatment allows parents to arrange a comfortable treatment place, which affects intimacy during the treatment process. Autistic children feel valued for their wishes and decisions.

When instructing autistic children at home during the Covid-19 pandemic, educators deem several characteristics problematic (Table 4). First, it has to do with the fact that autistic children have a more difficult time gaining access to learning tools and materials at home than at school. Second, it pertains to the characteristics of technological devices utilized for distance art education and treatment. Thirdly, emphasize the difficulties that arise when procedures are altered concerning school, learning, and art treatment. During the Covid-19 pandemic, autistic children who are cut off from their peers risk becoming socially isolated to the point where they cannot study with their peers.

Characteristics and communication processes in the online-based empathy room therapeutic ecosystem are derivatives of activities conducted in face-to-face educational treatment. This stems from the issue of educational connectivity, which is the driving force behind the online communication process. Connectivity from schools is influenced by personal ties and how to make autistic children subjects, intimacy, school involvement, school climate, and conditions that support online-based therapeutic activities (Vahabzadeh et al., 2018)symptoms of attention-deficit/hyperactivity disorder, and chronic irritability. These challenges hinder academic progress and frequently persist despite educational, behavioral, and medical interventions. An assistive smartglasses technology may aid these individuals, especially if the technology is efficacious in ecologically-valid school settings. This study explored the feasibility and efficacy of Empowered Brain, a computerized smartglasses intervention designed as a socio-emotional behavioral aid for students with ASD. Methods: This two-part six-week study involved four school children with ASD from a public elementary school. The study incorporated an initial three-week feasibility stage followed by a three-week controlled longitudinal efficacy stage. Both stages involved the use of a twice-daily socio-emotional intervention with the smartglasses. Educators completed pre-intervention and post-intervention Aberrant Behavioral Checklist (ABC.

Attachment is related to the autistic child's perception of therapeutic activities and their complexity, which are aspects of involvement related to the participation of children with autism. The school's spirit is reflected in the opportunity space atmosphere, which significantly impacts how autistic children interact with their peers and instructors. There is a common thread throughout this dimension that pertains to the relationships autistic children have with schools and individuals and the role that their environment plays in those relationships (MacCormack & Kilmer, 2023). Based on the preceding classification, we can distinguish between functionality (involvement) and influence (bond, attachment, and ambience) for the constructs that influence the communication process of autistic children in online therapeutic activities. Even though teachers invest additional time and energy into sustaining positive school relationships, learning and therapeutic arts activities at home for autistic children are frequently negatively impacted. Therefore, it is necessary to investigate the synergy between instructors, autistic children, parents, schools (and their environment), and technology to enhance the creative process in art therapeutic activities.

According to Hartmann, children's cognitive development is highly dependent on developing and mastering language and social interactions (Hartmann, 2018). Children can learn about their development through informal or formal interactions between adults and children. In the case of therapeutic art education for autistic children, this interaction could consist of the art therapist guiding the child in the development of language and cognitive abilities via creative expression.

Moreover, Hartmann argued that children's social interactions significantly impact the development of complex thought processes (Hartmann, 2018). As autistic children may struggle with social interaction and communication, art treatment sessions could provide the child with a safe and supportive environment to engage in social activities and progressively internalize the skills and processes involved. In addition, as

children discuss events, objects, and problems with adults and other knowledgeable individuals, the outcomes of these conversations will become a part of the child's cognitive structure. The art therapist can facilitate this process by guiding the child in ruminating on and expressing their thoughts and emotions through their artwork.

Challenging assignments promote the optimal development of cognitive skills. In therapeutic art education for autistic children, this may entail gradually increasing the complexity of the art activities, affording the child opportunities to push themselves beyond their comfort zone and acquire new skills and abilities. The art therapist can play a vital role in identifying the child's strengths and weaknesses and tailoring the activities to their specific requirements and skills. Applying opportunity space can inform the design and implementation of therapeutic art education for autistic children. The treatment can promote the child's optimal cognitive and social development by providing a supportive and interactive learning environment, focusing on language and cognitive development, and progressively increasing the complexity of art activities.

4. Conclusion

Through therapeutic art education, autistic children can explore various art forms, communicate their thoughts and feelings, and develop social and emotional skills. The opportunity space of therapeutic art education is a safe and nurturing environment where autistic children are encouraged to express themselves through various art forms. This space provides them with a means of communication that may need to be improved through traditional verbal communication methods. Through therapeutic art education in opportunity space, autistic children can also learn to communicate their thoughts and feelings in non-verbal ways, which can be particularly beneficial for those who struggle with speech and language development. Therapeutic art education creates an opportunity space for autistic children to express themselves creatively, explore new ideas, and improve their social and emotional skills. It is a valuable tool for supporting the development and growth of autistic children, providing them with a safe and nurturing environment for artistic expression.

However, it is essential to acknowledge the limitations of this research. One of the primary constraints lies in the study's scope, predominantly focusing on a specific age range within a single cultural and geographical context. Future studies could expand on these findings by including a more diverse participant group across various age ranges and cultural backgrounds. Additionally, the online nature of the program, while beneficial in many aspects, may only capture part of the spectrum of engagement and interaction possible in a physical setting. Future research should explore hybrid models that combine online and face-to-face methods to enhance the efficacy of therapeutic art education. While therapeutic art education creates a vital opportunity for autistic children to explore their creativity, express themselves, and improve social and emotional skills, further research is needed to fully understand its impact across diverse contexts and modalities. The development of comprehensive, inclusive, and adaptable art education programs remains an essential goal for the continued support and growth of autistic children.

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