



Exploring the Application Dimensions of AR and VR Technology in Digital Media Art: On the Education of kids with Special Learning Disabilities

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ABSTRACT

Augmented Reality (AR) and Virtual Reality (VR), rooted in the foundation of the Internet, have reached a state of development that is exceptionally robust. The introduction of these technologies has brought a significant diversification to the artistic landscape of digital media, particularly influencing children's education. Notably, VR and AR bear profound implications for the learning experiences of children with special educational needs. This thorough analysis aims to delve into the distinctive features of digital media art supported by VR and AR technologies, exploring their impact on the education of children facing learning disabilities. The initial section of the paper delves into the defining features of VR and AR technologies within the virtual space of digital art. Subsequently, the study reviews the extensive effects of VR and AR technologies on the education of children with special needs, with a primary focus on those grappling with Specific Learning Disabilities (SLD), Attention Deficit Hyperactivity Disorder (ADHD), and Autism Spectrum Disorder (ASD). Lastly, the research discusses and summarizes the impact of digital media art, underpinned by VR and AR technologies, on children's healthcare experiences. This in-depth investigation aims to provide a comprehensive and systematic reference for future VR and AR-based digital media art initiatives in children's education and health research.

Keywords: AR and VR - Application - Kids education - Media art - Special learning disabilities.

1. Introduction

The term 'Special Learning Disabilities' serves as an encompassing label for a spectrum of learning disorders, primarily stemming from irregularities in brain development. This aberration in the central nervous system subsequently gives rise to challenges in the automatic and fluent recognition and recall of individual words among school-aged children.

This "hidden disorder" eludes apparent visual indicators and remains unrelated to intelligence. Children grappling with special learning disabilities often display fully normal or even above-average intelligence. Current research suggests that medication proves largely ineffective in addressing special learning disabilities, given their inherent nature as a "disorder" or, in some instances, a "defect" (Charleen Dere-Meyer, Brooke Bender, Einat Metzl, Kathryn Diaz, 2021). Timely identification of children with special learning disabilities, coupled with targeted interventions such as visuospatial awareness training, artistic skills development, learning skills enhancement, counseling sessions, and speech therapy, among others, alongside robust support services, could significantly enhance the overall situation.



Children diagnosed with Attention Deficit Hyperactivity Disorder (ADHD) or Autism Spectrum Disorder (ASD) often grapple with special learning disabilities. A study exploring interventions for children with autism revealed notable improvements in targeted behaviors from their baseline levels post-treatment. This discovery suggests that the investigated system could potentially provide an effective learning environment to enhance social understanding and skills in children with autism.

Moreover, the study utilized a VR device equipped with a headset to intervene with ASD children, resulting in enhanced social understanding and skills in three participants. The research centered on a system rooted in immersive virtual environments, scrutinizing the effectiveness of nonverbal communication, social initiation, and social cognition techniques for each participant. Additionally, the investigation delved into the prospective future impact of immersive digital devices on children with ASD (Yufang Cheng, Cheng-Li Huang, and Chung-Sung Yang, 2015).

Advances in technology hold the promise of introducing novel and potentially more effective treatment strategies, thereby elevating the quality of life for individuals with autism spectrum disorder (ASD) and their families (D. J. Brown, Neale, & Cobb, 1999). Among these groundbreaking developments, virtual environments (VEs), a computer-based learning modality centered around visual representation, present unique advantages for teaching abstract concepts.

For instance, a recent study posits that the application of augmented reality (AR) technology could enhance frustration tolerance in children diagnosed with attention-deficit/hyperactivity disorder (ADHD). The study uncovered a notable increase in resistance to setbacks among children engaged in AR-based interventions. This experimental study delved into the utilization of AR technology to foster frustration tolerance in ADHD learners (kids). By employing a learning app designed with augmented reality technology, researchers assigned activity tasks to children with ADHD. The user interface (UI) design within digital media art was leveraged to discern that ADHD participants exhibited greater resistance to setbacks in AR environments compared to their counterparts without AR technology (Arnel B. Okay, Reynold A. Rustia, Thelma D. Palaoag, 2018).

Head-mounted virtual reality (VR) and augmented reality (AR) devices offer the benefits of compactness, an expanded user field of vision, and lightweight design. These technologies can create interactive spaces, such as employing computer software to design a digital art app and establish virtual cinemas, analog campus environments, and social settings. As such, future VR and AR technologies have the potential to assist children in sustaining their attention levels, a common challenge among children with special impairments. Consequently, the development of a digital art app based on VR and AR technology is both advisable and advantageous.

2. Background

2.1 On children with special disabilities

"Special learning disabilities" (SLD) encompass a range of conditions, such as dyslexia, dysgraphia, speech communication disorders, nonverbal learning disabilities, visual perception deficits, mobility issues, and others. Impaired skills include reading, writing, and mathematical computation, as well as the development of advanced abilities like organization, time management, executive function, abstract thinking, reasoning, memory, and attention. Research from the Harvard Child Development Center indicates that these specific abilities can be acquired through nurture, as they are not innate. Special learning disabilities often occur in those with attention-deficit/hyperactivity disorder (ADHD) and autism spectrum disorder (ASD). ADHD, or attention-deficit disorder (ADD), is characterized by impulsivity and difficulty adapting to societal norms, while ASD is a pervasive developmental disorder often referred to as autism. The World



Health Organization estimates the global prevalence of autism at 62 per 10,000 (0.62 percent), or one in 160 children. Studies worldwide suggest the actual prevalence of autism may be higher. According to the U.S. Centers for Disease Control and Prevention's (CDC) Autism and Developmental Disorders Surveillance (ADDM), one in 59 children is autistic. Research finds that 1-2 percent of Asians have autism, and that number is rising. Due to the lack of census data in many developing countries, only children with severe symptoms can be diagnosed, leaving many with mild issues undiagnosed. Medication alone can only temporarily control ADHD and does not improve the ability of these children to cope. In the context of the global COVID-19 pandemic, the strain on medical resources is immense, making the recovery situation for children with special impairments particularly challenging. For these reasons, rehabilitative healthcare and intervention education are crucial. Intervention takes the form of digital media art, a new art form based on digital technology and modern media that combines scientific rationality with artistic emotional expression. Digital media art relies on technologies such as virtual reality (VR), augmented reality (AR), mobile app development, computer software development, virtual cinema, and multimedia design.

For instance, school-age children could be grouped, and these interventions implemented in education and rehabilitative care. A time period could be chosen in which one group receives the above-mentioned rehabilitative training, while the other does not, and then test data collected from both groups. By comparing and analyzing pre- and post-intervention data between the rehabilitative and non-intervention groups, the results can provide a better reference for improving the recovery of sick children. In conclusion, the study holds promise in advancing the understanding and implementation of innovative interventions for children with special learning disabilities.

2.2 AR and VR Technology and Its Validity

To effectively enhance the learning and social environment for children with special disabilities, it is essential to understand and rationally utilize the role of digital media art and its virtual reality (VR) and augmented reality (AR) technologies. A comfortable learning environment can stimulate the learning initiative of children with special disabilities, while a positive social environment can mitigate their discomfort. Research has demonstrated that the frustration tolerance of ADHD participants in AR settings exceeds that of groups without AR technology (Arnel B. Okay, Reynold A. Rustia, Thelma D. Palaoag, 2018).

Some studies have highlighted the recreational and therapeutic benefits of gaming in improving attention spans and cognitive abilities in children with special learning disabilities. As we delve further into the potential of digital media art, specifically leveraging VR and AR technologies, it becomes evident that these innovative approaches can provide tailored interventions to address the unique challenges faced by children with ADHD and autism spectrum disorder (ASD). The immersive nature of VR and AR creates an engaging learning environment that caters to the diverse needs of these children.

Moreover, the integration of digital media art in educational practices fosters inclusivity and promotes holistic development. The study aims to contribute valuable insights into the practical applications of digital media art, shedding light on its potential to revolutionize the educational landscape for children with special learning disabilities. As we navigate the intersection of technology and education, it is imperative to prioritize the well-being and cognitive development of these children, offering them innovative and effective tools for a brighter and more inclusive future.



For instance, a study has proposed a method to design serious games that employ augmented reality (AR) technology to improve attention in school-age children with ADHD. This approach, drawing on the principles of serious play, analyzes intrinsic motivation and cognitive behavioral interventions using emerging technologies and learning styles. It enables students to interact with digitally embedded virtual information in real environments, ultimately resulting in an AR serious game. Such intervention strategies offer hedonistic play that positively impacts children's attention and willpower, fostering their learning processes, social interaction, and encouraging the expansion of critical thinking in this educational environment.

Additionally, these games have been demonstrated as one of the most effective methods of rehabilitation for daily life skills (Diego Fernando Avila Pesantez, Luis A Rivera, 2016). Most games incorporate a music-art element, even in patients with conditions like dementia and Parkinson's, improving their cognitive ability and resilience while alleviating mood disorders and depression (Khan et al., 2016). This multifaceted approach not only enriches the learning experiences of children with special learning disabilities but also highlights the broader therapeutic potential of digital media art in diverse healthcare contexts.

3. Method

This study delved into literature spanning the period from 1995 to 2023 to investigate the convergence of digital media art and rehabilitation for children with special disabilities. The initial step involved identifying search terms. Digital media art, an emerging art form, seamlessly blends art with technology. Its applications leverage digital technology or digital media to create various forms of visual art, including digital video, digital film, display art design, and more. Its expressive methods encompass a broad spectrum, featuring AR technology interactive devices, VR technology multimedia devices, web video games, cartoon animation, digital photography, and beyond (Yang Shuwen, 2020). What sets it apart from other art forms is that its form or creative process must be rooted in digital technology. For instance, the focus of this paper, the VR and AR technique, serves as clear proof.

Subsequently, the study identified the primary target groups influencing the recovery experience: children, their parents, and school staff. Therefore, the iterative search keywords included artistic intervention; Digital media art; AR and VR technology; 3D virtual technology; Art Creation Psychology; Children with ADHD; Autism (ASD); special learning disabilities (SLD); Special education; Rehabilitation health care; Family environment; School environment; Medication; Environmental awareness; interpersonal relationships.

The databases employed in this study included Elsevier, PubMed, WOS, Springer Open, Scopus, Google Academies, China CNKI, and others. The advanced search function was predominantly used to input keyword search results. To enhance the quality and novelty of the literature and data acquired, this study adopted 1995-2023 as the timeframe for literature search. Once the overall retrieval scheme was established, and in adherence to the principle of seeking high-quality literature for review, the titles and abstracts of selected literature were meticulously examined to determine whether any papers met the relevant screening criteria. Subsequently, the methods employed in each article, details about the participants, the experimental testing process, and the analysis and discussion of results were scrutinized. Finally, the chosen results were systematically classified and summarized, leading to the creation of corresponding data analysis tables.



4. Results

4.1 On Special learning disability (SLD) inclination

In a non-pharmaceutical intervention, digital media art holds the potential to ameliorate disruptions in real-world social environments and enrich the rehabilitative experience for children with special needs. A recent groundbreaking study, featured in the prestigious journal *Nature*, scrutinized the effectiveness of a 3D social understanding system seamlessly integrated with a headset display. This cutting-edge system, meticulously developed and tested by Digital Art 3D, is rooted in an immersive virtual environment.

Conducted by esteemed researchers Yufang Cheng, Cheng-Li Huang, and Chung-Sung Yang, the study homed in on personalized roles tailored to children with special disabilities within the digital realm. The research delved into non-verbal communication, social activities, and social cognition among participants, assessing the impact of immersive digital devices on this specific cohort of children with disabilities.

In a preliminary empirical study involving three children with special impairments, the researchers observed notable improvements in various behaviors after the utilization of the software system. This promising outcome suggests that the system could furnish a more effective learning environment, enhancing the social understanding and skills of children with special needs. Consequently, digital media art emerges as a compelling avenue for addressing the distinctive challenges faced by this population (Yufang Cheng, Cheng-Li Huang, and Chung-Sung Yang, 2015).

In a groundbreaking study spearheaded by Mansi Vora at the Rochester Institute of Technology's School of Imaging Arts and Sciences, a pioneering approach to learning has been unveiled, focusing on the realms of mathematics and computer software. This innovative method not only aids students in maintaining focus but also facilitates a deeper understanding of complex mathematical concepts, particularly beneficial for those with learning disabilities. The incorporation of digital animation games in the study seeks to activate a more engaging and enjoyable learning experience, providing a scalable format for increased practice opportunities and mastery (Mansi Vora, 2012).

Comprising four teachers and six students, the research team utilized various tools, including the Design Watch, Student Watch, and Standard Reference Assessment Tool to collect comprehensive data. The findings underscore that augmented reality (AR) technology is exceptionally well-suited for educational purposes, conferring substantial benefits to children with special needs by offering authentic and immersive learning experiences. Notably, the study revealed heightened enthusiasm and anticipation among students when AR technology was employed, leading to increased participation, interest in related subjects, and improved engagement. The positive outcomes observed suggest that integrating this AR-based digital media environment, crafted by artists, into the holistic capacity development of children with special learning disabilities is a recommended course of action (Recep Cakir, Ozgen Korkmaz, 2018).

Currently, a multitude of studies are exploring digital media art systems, with virtual reality (VR) technology being trialed in diverse populations, notably among children with disabilities. However, several challenges have emerged, including a shortage of proficient human resources, specifically educators skilled in utilizing this technology, and the high associated costs of equipment. In contrast, augmented reality (AR) technology is rapidly advancing and gaining popularity due to its enriched reality features. Nevertheless, most studies involving AR technology have predominantly focused on physical therapy for patients.

In response to these challenges, a forward-thinking research proposal suggests an AR framework infused with playful elements to enhance learning experiences for children



with special impairments through the integration of computer games. The study emphasizes how educators, supported by this framework, can effectively foster the development of concepts and cognitive skills in children with disabilities (Rogério Colpani, Murillo Rodrigo Petrucelli Homem, 2015).

Dyslexia, a complex psycho-cerebral syndrome in children, manifests in diverse ways, impacting verbal and non-verbal communication, social interaction, speech comprehension, reading, writing, and learning. Augmented Reality (AR) technology, a digital media innovation that superimposes 3D virtual objects in real-time, is explored as a transformative tool. In a groundbreaking study, an innovative model of digital media learning converged with AR technology to address dyslexia, a specific learning disorder.

This study ingeniously employed digital media applications founded on interactive AR technology, tailoring educational approaches for children with dyslexia. The research introduces a pioneering dimension that assists these special children in overcoming challenges in a captivating and straightforward manner. The learning framework for this interactive AR-based digital media application was meticulously designed, specifically focusing on children with specific learning disabilities. The ultimate goal is to empower these children to interact with the framework, thereby improving their dyslexia and related challenges (Zeeshan Bhatti, Maymoona Bibi Homem, Naila Shabbir, 2020).

Table 1- Review of studies that improve SLD

Year	Participants No.	Outcome measures	Results
2018	6 children with special impairments	Design watch	Children aren't born with these skills, and they have the potential to develop them
2015	3 ASD children is difficult to adapt to the environment	They tested the system based on 3D virtual environment	Provide a good learning home, environment and social environment for promoting social skills improvement in children with ASD
2012	One Students with specific learning disabilities can indeed through art training it is geared to the needs of the children with ADHD and mathematics learning disabilities	By AdobeFlash software builds. Encourage them to try a new method of study, at the same time enjoy a variety of fun. It focuses on the arithmetic knowledge, introduced by animation, in the form of interactive games, to strengthen the children grasp of the knowledge and skills.	This form is scalable, can expand children's ability of practice
2018	3 Students with specific learning difficulties as a case study	Through a 4-week art program training, hope and by solving art problems. The art project writing training is different from the previously mentioned painting creation intervention, the intervention set training content more single-minded, also more focused on	Students with specific learning disabilities can indeed through art training to develop their ability to execute, the corresponding thinking, reasoning, memory and attention skills has improved, and the ability to raise help students in the



			process of other learning difficulties
2019	66 Autism kids is a large part due to the lack of executive function	The executive function teacher version of the behavior rating scale (short teacher table). The result of the intervention group with children from two schools (as control group)	All 66 children improved their executive function. And the intervention group was significantly higher than the control group

4.2 ADHD tendencies in children

Integrated into digital media art systems, Augmented Reality (AR) and Virtual Reality (VR) technologies demonstrate significant therapeutic efficacy in mitigating Attention Deficit Hyperactivity Disorder (ADHD) in children. As the prevalence of ADHD in children escalates into a global social problem, traditional physical therapy methods reveal their limitations, proving largely ineffective. The integration of AR and VR technologies within digital media art systems offers a promising avenue for addressing the challenges posed by ADHD in children.

A study introduced the concept of interaction through the lens of art therapy, amalgamating pathologic clinical experiences with children diagnosed with Attention Deficit Hyperactivity Disorder (ADHD). The study concentrated on the fundamental requirements, design processes, and execution of immersive Augmented Reality (AR) animation therapy. This exploration provides a foundation for interdisciplinary research bridging the realms of digital media art and ADHD therapy (Yunpeng Tang, 2021).

Low frustration tolerance is a distinctive characteristic of children with special learning needs, potentially hindering their goal achievement. Research has showcased the prevalence of such obstacles in children with ADHD. An experimental study delved into the effectiveness of AR technology in enhancing frustration tolerance in children with ADHD. Participants engaged in learning tasks utilizing an app with AR features, and researchers scrutinized measurements of frustration tolerance under AR conditions. Additionally, they recorded time spent on each activity in different environments for comparative analysis. The findings indicated that the utilization of AR technology can elevate frustration tolerance in children with ADHD. In contrast, no significant changes were observed in frustration tolerance data in settings where AR-based methods were not implemented (Arnel B. Okay, Reynold A. Rustia, Thelma D. Palaoag, 2018).

In a recent scientific investigation, researchers explored the potential impact of Augmented Reality (AR) technology on word recognition learning. The research team developed an interactive AR video designed to enhance word learning, utilizing mobile phone cameras to superimpose 3D virtual objects onto real-life scenes. The study focused on two fifth-grade students, each with a predisposition for attention deficit hyperactivity disorder (ADHD) and dyslexia.

Following the ABA experimental model, where A represents the baseline group, B denotes the intervention group, and A' indicates the maintenance intervention group, the research spanned nearly three months. The findings unveiled that both children, despite their pre-existing conditions such as ADHD and dyslexia, demonstrated significantly improved scores during the intervention period. Furthermore, a notable enhancement persisted during the intervention maintenance stage (Lin, Yu, Chen, Huang, & Chien-Chi, 2016).



Table 2- Review of studies that improve ADHD in kids

Year	Participants No.	Outcome measures	Results
2018	One Children with ADHD	The study assigned learning tasks to children with ADHD using a learning app with AR features. They analyzed measurement of frustration tolerance in children with ADHD in AR settings	They found that the use of AR technology can increase frustration tolerance in children with ADHD
2016	2 ADHD children is difficult to adapt to the environment	The study used experimental groups in the ABA 'model, with A representing the maintenance intervention group	Over nearly three months, the results showed two children with predispositions such as ADHD and dyslexia had significantly higher scores during the intervention

4.3 Tendencies in ASD children

The application of virtual reality (VR) technology in the education of autistic children has reached unprecedented heights and has been a focal point of research for over two decades. Some researchers propose that this technological approach may provide authentic "real-world" training for social and life skills within a secure, controlled, and reproducible virtual environment. The availability of authentic "real-world" settings for social and life skills training is made possible within a safe, controlled, and repeatable virtual environment.

The emergence of low-cost VR headsets, such as Google Cardboard and Oculus Rift, has revitalized interest in their utilization across a broad spectrum of applications, particularly in the education of individuals with autism (Ryan Bradley and Nigel Newbutt, 2018).

In recent times, a plethora of research has addressed concerns related to the education of individuals with Autism Spectrum Disorder (ASD). An exemplary study meticulously examined the impact of Augmented Reality (AR) technology on the education of three primary-aged students exhibiting ASD tendencies. This cutting-edge technology superimposes digital media content onto the physical world, effectively blurring the lines between the digital and the real.

In the context of this study, researchers employed an AR-based digital cue sign to create a digital video model illustrating students demonstrating tooth-brushing techniques. By triggering the playback of this video, the study successfully guided all participating students to independently learn and master the art of tooth brushing. Remarkably, these children retained this skill even nine weeks following the AR intervention.

This study delves into the intricate relationship between technology theory and teaching practices, specifically focusing on the application of novel technologies to educate children with ASD. The findings, presented by David F. Cihak, Eric J. Moore, Rachel E. Wright, Don D. McMahon, Melinda M. Gibbons, and Cate Smith in 2016, undoubtedly carry significant implications for the future of ASD education.

In a recent study conducted at the University of Florida, researchers explored the impact of Virtual Reality (VR) video feedback on social communication skills among five students



with autism and social impairments. To form triadic groups, the research team enlisted two age-matched peers without disabilities as social partners for each ASD child. The experiment, carried out biweekly, involved 10 minutes of VR visual stimulation and social interaction, accompanied by personalized feedback and self-assessments.

The study's findings revealed notable improvements in the targeted individuals' social communication skills following the intervention. Interestingly, one participant exhibited enhanced academic performance in the classroom. Moreover, the data indicated increased motivation among the children to engage in social interactions. These results underscore the potential application of VR-based visual cue instruction within the realm of digital media art to facilitate language development among children with Autism Spectrum Disorder (ASD), as presented by Kathy S. Thiemann and Howard Goldstein in 2018.

Table 3- Review of studies that improve ASD children

Year	Participants No.	Outcome measures	Results
2020	10000 Children around the world	The report	62/10000 (0.62%) Equivalent to one ASD child in every 160 children
2020	10000 Children Around the Asia	The report	169/1000 (1.69%) Equivalent to one ASD child in every 59 children
2016	3 ASD Children	Using an AR-based digital cue sign, the study designed a digital video model of students brushing their teeth and triggered playback	It successfully guided all students to learn how to brush their teeth alone, and the children were able to retain this skill nine weeks after the AR intervention

5. Discussion

As demonstrated above, the integration of Virtual Reality (VR) and Augmented Reality (AR) technologies, combined with digital media art, has showcased the potential to improve the well-being of children with special learning disabilities, Attention Deficit Hyperactivity Disorder (ADHD), and autism. This integration also contributes to promoting their physical and mental health in various intervention settings. Considering the spectrum of symptoms exhibited by children, it is evident that there are more children with mild symptoms in real life compared to those with moderate to severe symptoms. This discrepancy is mainly attributed to a lack of census data in most developing countries, leading to insufficient attention being directed toward children with mild symptoms.

The previous COVID-19 pandemic, with stringent home isolation policies in place across various countries. Educational institutions globally have shifted to online instruction, creating a disconnect from the external world and exacerbating learning challenges for these children. Notably, Asian countries, including mainland China, Japan, and South Korea, are witnessing frequent disruptions in education due to extreme events arising from these challenges. Given this scenario, there is an urgent need for regular physical and mental health assessments for school-age children.

Simultaneously, a collaborative effort involving schools, families, communities, and society at large is crucial to establish a diverse education system and implement timely interventions in education. This multifaceted approach is essential to address the



unique needs of children with special learning disabilities and promote their overall well-being in the face of evolving challenges.

Innovative approaches to education, such as Virtual Reality (VR), Augmented Reality (AR) technologies, and digital media art, have demonstrated promising potential in enhancing children's learning capabilities and fostering their physical and mental well-being. However, a range of studies highlights the diversity of opinions regarding the appropriateness of different educational interventions for children with special disabilities. This variation in perspectives does not contradict the comprehensive findings of the study.

While some research, often based on case studies or small-sample investigations, suggests that larger sample sizes may contribute to more systematic studies, caution is warranted in selecting educational methods for children with special needs. Although this article references AR technology headsets, VR technology 3D virtual design, and visual media design software, it's essential to recognize that traditional art forms such as painting, calligraphy, clay sculpture, and even photographic photography can also yield successful educational outcomes.

CONCLUSION

In our endeavor to shed light on educational approaches tailored for children with special needs, our study sought to encapsulate and analyze the efficacy of various intervention experiences. Additionally, we delved into the potential implications of incorporating Virtual Reality (VR) and Augmented Reality (AR) technologies, as well as digital media art, as educational aids. Most of the research indicates that a range of VR and AR technologies, along with digital media art interventions, positively influence children's learning capabilities.

When devising and implementing interventions for children with special disabilities, it is crucial to consider the influence of the school environment, teacher cohorts, and interpersonal relationships. The review of research and literature underscores that sound educational methods and interventions, coupled with healthy learning environments, excellent teacher groups, and positive interpersonal relationships, may contribute significantly to improving the abilities of children with special impairments. Furthermore, such holistic approaches have the potential to reduce psychological stress and alleviate learning difficulties for these children.

This research carries substantial importance in unraveling the intricate interplay between diverse technological advancements and the comprehensive spectrum of digital media art interventions in the realm of education. However, it is crucial to recognize that theoretical research alone may not be sufficient to significantly impact children with disabilities compared to practical research. Therefore, there is a considerable journey ahead, encompassing both theoretical exploration and the practical implementation of educational interventions, to make a meaningful difference in the lives of children with special needs.

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