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Empowering play: parents shaping serious games for disabled children

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1 Introduction

In the current era of interactive digital applications, Serious games are designed with a primary purpose to educate, train, raise awareness and for developmental purposes. Unlike traditional video games, the purpose of serious games is to focus on learning outcome, behavior change and skill development rather than just fun. Typically for children with cognitive, emotional, or social challenges, serious games can be very helpful as it offers customizable, engaging and a motivating environment that normally is not found in a traditional teaching environment. As per the study its observed that children with disabilities often face difficulties in expressing emotions, they sometime find it difficult to adapt to standardized learning tools and few also face challenges due to limited social interaction. The above challenges hence highlight the need for having personalized approaches during development of customized serious games. Therefore, the role and involvement of parents in the design and customization of serious games becomes critical as they are the ones who possess deep insights into the unique need of their child as per their daily experience. Their feedback can help the game designers to ensure that the games being designed are both emotionally resonant as well as accessible to their children. The article explores how parents can be empowered to actively contribute to the design of serious games which will surely enhance the social and emotional development of children with disabilities.

2 Understanding serious games for children with disabilities

As per the recent studies, there is a growing interest in the usage of serious games as effective tools especially for supporting children with disabilities across physical, socio-emotional and also cognitive domain. In a study conducted and published in the Journal of Autism and Developmental Disorders (Ferreira and Parisotto, 2025), it was found that serious games like “Secret Agent Society” was helping children with ASD by significantly improving their social communication abilities. This particular game was designed in a way in which children were put in role play missions and they had to recognize emotions, engage in conversations, and also handle anxiety. The children who played these games showed a measurable improvement in few of their skills when compared with traditional interventions.

Research findings of the University of Melbourne (2022) indicate that Kinect-based games offer better balance and motor improvement in children living with cerebral palsy as compared to conventional treatment, and that they have stronger motivation

levels. It is however limited by accessibility which is a problem in children with serious motor impairments since they may not handle the physical nature or scope of motion-based systems.

A serious game DysEggxia (Rauschenberger et al., 2022) was designed specifically for dyslexic children. It was reported that the children who played the game for a span of 6 weeks showed a good amount of improvement in fluent reading and also with accurate spellings. A study conducted on game RETHink (David et al., 2019) showed that strategies for emotional regulation were learned more effectively by children with ADHD rather than through traditional therapy sessions alone. Therefore, for promoting both academic and non-academic skills, serious games are seen as good tools. The personalization and adaptability are the crucial features that must be considered during the design of these games as they will keep the motivation and engagement level of children high at all times. The summarizes few recent serious games that are designed for children with special needs is presented in Table 1 and the types of serious games w.r.t different disabilities visualize in Figure 1.

3 The role of parents in game design

Children with disabilities usually have several weaknesses like the inability to express emotions and an inability to use standardized educational instruments, therefore indicating the necessity to develop custom and inclusive interventions (Smith and Merwin, 2021). The involvement of the parents can be instrumental in creating serious game design in this respect. Parents provide original information about the daily life of their children, emotional drivers, and their communication patterns and make games more informative. For example, they may help in crafting the culturally

relevant character and scenarios in the game so that its more relatable to the child. They may even assist in drafting the storylines that they feel their child encounters more frequently such as making friends, talking with a stranger, expressing frustration etc. Furthermore, the parents may also give inputs when it comes adjusting the elements of gameplay, like reward system, difficulty level so as to better align it with child's motivation and individual pace of learning. Therefore, it would be beneficial to treat parents as collaborators during the design of serious games rather than just as passive consumers. This will surely result in designing serious games that are more holistic, culturally aware as well as emotionally intelligent which will ultimately result in more effective and impactful learning tools for children with disabilities (López-Bouzas and del Moral-Pérez, 2025).

4 Benefits and challenges of parental involvement

As the parents understand their child's behavior, preferences and learning style more than anyone else, it's truly beneficial when parents are involved during the design process. This helps to get deeper insights into the child's need. The contribution made by parents during creation of storyline, cultural elements etc. in a game can make it more engaging and emotionally resonant for the child. Also, as they are the part of the game design process it's more likely that they will encourage its use consistently at home thereby maximizing learning and therapy outcomes. However, involvement of parents is not without its challenges. A common problem is that of the lack technical skills. Parents may not be aware of digital platforms or educational technology or maybe unsure about how

TABLE 1 Games supporting diverse learning needs.

Serious game	Targeted disability	Purpose/focus	Research source	Parental involvement
Liberi Exergaming System	Autism Spectrum Disorder (ASD)	Enhancing physical activity and social interaction through kinesthetic gameplay	Faccio et al. (2022)	Encouraged for home engagement and motivation support
Somatosensory Interactive Game	Autism Spectrum Disorder (ASD)	Improving attention, spatial skills, and coordination via art-based motion games	Jia et al. (2023)	Parental supervision recommended during gameplay
RL-Based Personalized Games	Rare Neurodevelopmental Disorders	Supporting adaptive behaviors using reinforcement learning	Machado et al. (2024)	Limited; primarily therapist-driven
Game-Based Learning	Various Disabilities	Systematic review on serious game effectiveness	Radiani et al. (2022)	Varied; often beneficial but inconsistently reported
Space Invaders Extreme 2	Developmental Dyslexia	Enhancing phonological and reading skills	Franceschini et al. (2022)	Minimal; optional support during sessions
Kinems Platform	Dyspraxia, Autism, ADHD, Dyslexia	Improving motor, cognitive, and attention skills	Wolinsky (2021)	Active involvement for goal setting and monitoring
Accessible Game Interfaces	Dyslexia	Enhancing reading accessibility and inclusive UI design	Jaramillo-Alcázar et al. (2021)	Indirect role in choosing/setting up appropriate tools
Interactive Digital Game	Developmental Disabilities	Improving visual-perceptual skills	Lin et al. (2022)	Passive; parental feedback used in assessment stages
Adaptive Serious Games Suite	Specific Learning Difficulties (SpLD)	Adaptive difficulty games for cognitive training	Yildirim and Surer (2021)	Limited; may assist with setup or feedback

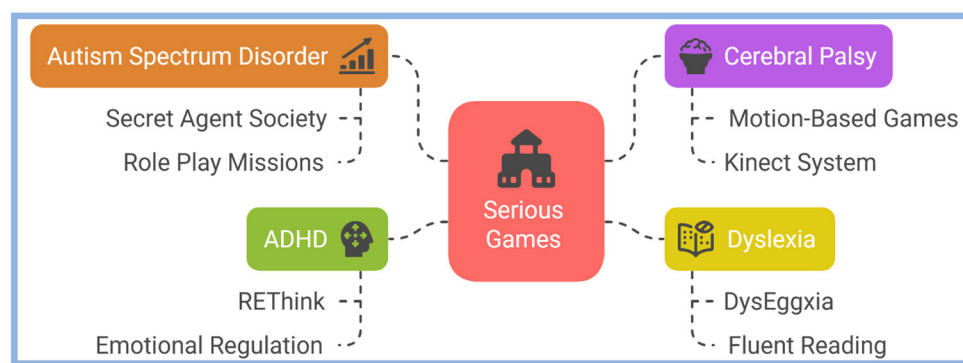


FIGURE 1
Serious games for children with disabilities.

to provide useful feedback on design and content. Additionally, there may be cases where parents' opinion can vary widely and this may pose a challenge for developers trying to create scalable solutions. Also, many parents of children with disabilities may have limited energy and time as they may already be balancing work, managing other responsibilities along with caregiving to their child with special needs. Therefore, the key here is to include the parents as valued partners by not burdening them with many tasks and not compromising on child's independence. Structured way for giving feedback, easy to use customization tools and a simple and usable design practice can help the developers to bridge this gap with the families.

5 Future trends and possibilities

New information technology will provide access to future educational games for children with special needs by equipping parents to customize educational gaming experiences. People in the game development sector will encounter wide-ranging disruptions from AI-powered no-code platforms and wearable assistive devices and no-code technology platforms.

AI-powered no-code platforms represent a radical development because they grant parents ability to create games even though they lack programming expertise. No-code platforms use artificial intelligence functions to create automated complex graphics that deliver automated characters with movement features alongside adaptive intelligent scene transition capabilities that react to detected obstacles. Parents access two options through a single-button interface enabling them to select pre-made templates or upload their own content to start designing games by choosing between written dialogue or spoken exchange inputs for personalized game development. Custom-designed games built by caregivers function to meet academic specifications while maintaining emotional assistance for their children.

The development of serious games demands precise decorative features which should integrate with assistive technology for better performance. Through integration of motion sensors and eye-tracking and speech interpretation technologies the AI system collects essential game information about child movement and pays attention to focus span and emotional status. Through this technological platform special needs children can build superior

communication connections with other individuals. The evaluation of real-time data lets professionals establish personalized therapy methods through their analysis of collected information.

6 Conclusion

Involving parents in the design of serious games for children with disabilities can prove to be a powerful resource that still remains underutilized. The contribution of a parent toward this can help create games that are more engaging and deeply personal rather than being just educational. The games designed with such collaboration between developers and parents may in effect be more relatable and support the transfer of skills into real life situations. With some structured training programs and few workshops, we can further empower parents to take an active role in shaping educational technologies and ensure that serious games continue to evolve as an effective tool for learning and development tasks.

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