



EDITORIAL ARTICLE

Mathematics Learning Challenges in Autism Spectrum Disorder

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1. INTRODUCTION

Children with verbal high-functioning type of autism spectrum disorder (ASD) may face several challenges in mathematics learning, as follows:

i. Difficulty understanding abstract concepts:

Many mathematical concepts, such as fractions or algebraic equations, can be abstract and challenging for verbal learners with autism to grasp.

ii. Sensory sensitivities:

Some children with autism may have sensory sensitivities that make it difficult for them to concentrate in a traditional classroom environment, especially if there are distractions like bright lights or loud noises.

iii. Executive function deficits:

Difficulties with organization, planning, and problem-solving can impact a child's ability to approach math problems systematically.

iv. Language processing issues:

Verbal children with autism may struggle with understanding mathematical vocabulary or following verbal instructions, which are crucial for learning math concepts.

2. WHAT EDUCATIONAL THERAPISTS CAN DO

Educational therapists can address these learning issues by:

i. Providing individualized instruction:

Tailoring math lessons to the child's specific learning style and needs can help them better understand and retain mathematical concepts.

ii. Using visual aids and concrete materials:

Incorporating visual representations and hands-on activities can make abstract math concepts more tangible and easier for verbal learners with autism to grasp.

iii. Breaking down tasks:

Breaking down complex math problems into smaller, more manageable steps can help children with autism approach them systematically and build confidence in their problem-solving abilities.

iv. Teaching self-regulation strategies:

Helping children develop strategies to manage sensory sensitivities and improve attention and focus can support their overall learning experience in math.

v. Incorporating technology:

Utilizing educational apps or software designed for children with autism can provide additional support and reinforcement for math learning outside of the classroom.

3. CAREGIVING AND COUNSELING

Caregiving and counseling are related in that both involve providing support and assistance to individuals, but they serve different purposes and involve different approaches.

Caregiving typically involves providing practical assistance, emotional support, and physical care to individuals who may be unable to fully care for themselves due to age, illness, or disability. Caregivers often focus on meeting the daily needs of the person they are caring for, such as bathing, dressing, feeding, and providing companionship.

Counseling, on the other hand, involves helping individuals cope with emotional, psychological, or behavioral challenges. Counselors use various therapeutic techniques to help clients explore their thoughts, feelings, and behaviors, gain insight into their problems, and develop strategies for coping and problem-solving.

While caregivers may provide emotional support to those they care for, their primary role is usually focused on meeting the person's physical needs. Counselors, on the other hand, are trained to provide specialized support for addressing psychological and emotional issues. However, there can be overlap, as caregivers may benefit from counseling to help them cope with the stress and emotional challenges of caregiving, and counselors may work with clients who are also receiving care from a caregiver.

4. EDUCATIONAL THERAPY AS A MANAGING TOOL FOR VASCULAR DEMENTIA

Educational therapists (ETs) typically work with children with special needs because their training and expertise are primarily focused on addressing learning and developmental challenges in younger populations.

However, ETs can still play a role in the management of older patients with vascular dementia through:

i. Adaptation of educational strategies:

ETs can adapt their knowledge of educational techniques to develop strategies that cater to the cognitive and functional limitations of older adults with dementia. These strategies can help improve memory, communication, and daily functioning.

ii. Cognitive stimulation:

ETs can design activities and exercises to stimulate cognitive functions in older adults with dementia, such as memory games, problem-solving tasks, and reminiscence therapy, which can help slow cognitive decline and enhance overall well-being.

iii. Support for caregivers:

ETs can provide education and training to caregivers of older adults with dementia, offering guidance on how to effectively communicate, engage, and support their loved ones in daily activities.

iv. Advocacy and collaboration:

ETs can advocate for the inclusion of educational interventions in dementia care plans and collaborate with other healthcare professionals, such as occupational therapists and speech therapists, to provide comprehensive support to older adults with dementia.

While ETs may not traditionally work with older populations, their expertise in educational strategies and understanding of learning difficulties can be valuable in supporting individuals with dementia and their caregivers.

5. IS EDUCATIONAL THERAPY AN ART OR SCIENCE?

The practice of educational therapy is a blend of both art and science, drawing from various disciplines to address individual learning needs. There are several reasons why it is so and they are briefly discussed below.

In the context of scientific foundation, educational therapy relies on evidence-based practices grounded in psychological and educational theories. Professionals use assessments, data analysis, and research to understand learning challenges and develop interventions. As a result, there are two reasons why educational therapy should be considered to be in the domain of science:

i. Applied Techniques and Strategies (Science):

Educational therapy integrates various evidence-based techniques and strategies derived from psychology, special education, and related fields. Therapists apply structured approaches such as multisensory instruction, cognitive-behavioral techniques, and assistive technology to support learning.

ii. Continuous Assessment and Monitoring (Science):

Educational therapists employ systematic assessment procedures to identify learning strengths and weaknesses. They use quantitative data and qualitative observations to monitor progress, adjust interventions, and measure outcomes over time.

There are also two reasons why educational therapy is taken to be a form of art:

i. Customization and Flexibility (Art):

Like an artist, educational therapists tailor interventions to meet the unique needs of each learner. They creatively adapt teaching methods, materials, and strategies to suit individual learning styles, preferences, and goals.

ii. Empathy and Understanding (Art):

Successful educational therapy requires a deep understanding of the learner's emotional and psychological needs. Therapists use empathy, intuition, and interpersonal skills to build rapport, create a supportive environment, and address underlying emotional barriers to learning.

When put together the two domains, science and art, educational therapy is seen differently as follows:

i. Collaboration and Interdisciplinary Approach (Both):

Educational therapy often involves collaboration with educators, parents, psychologists, and other professionals. By integrating insights from multiple disciplines, therapists enhance their understanding of learners' needs and develop comprehensive intervention plans.

ii. Dynamic and Evolving Field (Both):

The field of educational therapy is continuously evolving, incorporating new research findings, technologies, and best practices. Therapists must balance scientific rigor with adaptability, embracing innovation while ensuring interventions remain evidence-based and effective.

In essence, educational therapy combines the scientific rigor of evidence-based practice with the artistic creativity of individualized intervention, making it a unique blend of both art and science.

6. WHAT AN EDUCATIONAL THERAPIST CAN DO TO HELP A CHILD WITH AUTISM TO MANAGE ANGER

When helping a child with autism manage anger, it is essential for educational therapists to employ strategies that are tailored to their unique needs and sensitivities.

The following step-by-step guide (with examples of varied hard skill sets that an educational therapist needs to equip themselves to enhance their professional skills) is provided below:

i. Understand triggers (e.g., use Antecedent-Behavior-Consequence/ABC chart or Functional Behavior Analysis/FBC): Identify the specific triggers that lead to the child's anger outbursts. These triggers can vary widely among individuals with autism and may include sensory overload, changes in routine, communication difficulties, or feeling overwhelmed.

ii. Teach Coping Skills (e.g., Mindfulness-Based Cognitive Therapy/MBCT, Social Skill Training/SST or Adaptive Behavior Analysis/ABA): Teach the child coping skills to help them regulate their emotions when they feel angry or frustrated. This could include deep breathing exercises, counting to ten, using visual supports like a calm-down card or a sensory tool, or finding a quiet space to retreat to when needed.

iii. Develop a Visual Schedule (e.g., Picture Exchange Communication System/PECS or visual cues): Create a visual schedule or routine to help the child anticipate transitions and reduce anxiety about unexpected changes. Having a clear plan of what to expect can help minimize frustration and prevent meltdowns.

iv. Practice Social Stories (e.g., Social Story Technique or Narrative Therapy): Use social stories or role-playing to help the child understand appropriate ways to express anger and interact with others when they're upset. Provide concrete examples and positive alternatives for handling difficult situations.

v. Encourage Communication (e.g., Direct Play Therapy/DPT, Verbal Behavior Analysis/VBA or Active Communication Approach/ACA): Encourage the child to express their feelings verbally or through alternative communication methods such as picture cards, sign language, or assistive technology. Validate their emotions and provide a safe space for them to communicate their needs.

vi. Model Calm Behavior (e.g., ABA or Task Behavior Analysis/TBA): Model calm and patient behavior yourself, as children with autism often learn by example. Stay composed during challenging situations and demonstrate how to manage frustration effectively.

vii. Provide Consistent Support (e.g., Positive Psychological Technique): Offer consistent support and reinforcement for positive behavior. Praise the child when they use coping skills effectively and provide gentle guidance when they struggle.

viii. Seek Professional Help: Consult with professionals such as autism specialists, occupational therapists, behavior analysts, or special education teachers who have experience working with children with autism. They can offer additional strategies and support tailored to the child's specific needs.

By implementing these steps and adapting them to the child's individual preferences and abilities, an educational therapist can help them develop effective anger management skills and navigate challenging emotions more successfully.

7. THE ROLE OF AN EDUCATIONAL THERAPIST IS MORE THAN JUST A CATALYST

An educational therapist plays a multifaceted and transformative role in the lives of children with special needs and their families, extending well beyond the function of a mere catalyst. Here are several ways an educational therapist profoundly impacts these lives:

i. Comprehensive Assessment and Personalized Intervention

Educational therapists conduct thorough assessments to understand a child's unique learning profile, including strengths, weaknesses, and specific needs. They then design individualized intervention plans that target specific learning difficulties, ensuring that strategies are tailored to each child's needs. This personalized approach helps the child achieve significant academic and developmental progress that generalized support might not accomplish.

ii. Emotional and Social Support

Children with special needs often face emotional and social challenges alongside their learning difficulties. Educational therapists provide a supportive environment where children can build self-esteem, confidence, and resilience. They help children develop coping strategies for frustration and anxiety, contributing to their overall well-being and social integration.

iii. Advocacy and Coordination

Educational therapists often act as advocates for the child within the educational system. They collaborate with teachers, school administrators, and other professionals to ensure the child receives appropriate accommodations and services. This advocacy is crucial in navigating the complexities of educational policies and ensuring that the child's rights and needs are met.

iv Parental Support and Education

For parents, an educational therapist serves as a vital source of support and education. They help parents understand their child's learning profile and the best ways to support their development at home. Educational therapists offer guidance on effective strategies, resources, and tools, empowering parents to become effective advocates and supporters for their child.

v. Long-Term Development and Lifelong Skills

The interventions provided by educational therapists are not just about immediate academic success but also about equipping children with lifelong learning and coping skills. These skills help children

become more independent and capable learners, which can have lasting effects on their academic, personal, and professional lives.

vi. Holistic Approach to Learning

Educational therapists address the holistic development of the child, considering cognitive, emotional, social, and behavioral aspects. This comprehensive approach ensures that all facets of the child's development are supported, leading to more balanced and sustainable progress.

vii. Creating a Collaborative Network

Educational therapists often build a network of support that includes other professionals such as speech therapists, occupational therapists, psychologists, and medical professionals. This collaborative approach ensures that all aspects of the child's development are addressed, leading to more effective and cohesive interventions.

In summary, an educational therapist is more than just a catalyst because they provide comprehensive, personalized, and sustained support that encompasses educational, emotional, and social dimensions. They play a pivotal role in advocating for the child's needs, educating and empowering parents, and fostering a holistic and collaborative approach to the child's development. This multi-layered impact ensures that children with special needs receive the support necessary to thrive in all areas of their lives.

8. WHY GOOD PARENTS ARE NOT ALWAYS EFFECTIVE CAREGIVERS?

Good parents may not necessarily be effective caregivers for their children with special needs because the demands and skills required to care for such children can be vastly different from typical parenting. This discrepancy arises from the following several factors:

i. Specialized knowledge and skills:

Generally speaking, caring for children with special needs requires a deeper understanding of developmental disorders, sensory processing, emotional regulation, and therapeutic interventions (Reebye & Stalker, 2008). Without these specialized skills, even well-intended parents may struggle to meet their child's unique needs.

ii. Emotional stress and burnout:

Raising a child with special needs can be emotionally and physically taxing (see Freitag, 2017, for detail). Good parents might find themselves overwhelmed, leading to burnout or what is known as the Caregiver Stress Syndrome (Chia, 2013), which can affect their caregiving abilities.

iii. Consistency and structure:

Children with special needs often thrive on routine and consistency (Wetherbee & Philo, 2015). This is more so for children who are on the autism spectrum. Parents who are good in general parenting may lack the strict structure that is beneficial for their child's specific requirements.

iv. Adaptability:

Good parents may not always possess the trait of flexibility or adaptability that is so much needed to respond to the evolving and sometimes unpredictable needs of their child with special needs (Barnett et al., 2003; Maul & Singer, 2009). The strategies that work with neurotypical children may not apply here.

v. Support systems:

Parents might also lack access to the necessary support systems, such as specialized caregivers, educational therapists, or other supporting educational resources, which are critical for effective caregiving (Ammari, Schoenebeck, & Morris, 2014).

From the above brief discussion, this principle of child-rearing can be referred to as adaptive caregiving or specialized parenting. Its main emphasis is that parenting children with special needs certainly requires appropriate adjustments and right strategies beyond traditional parenting practices.

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Author has declared that no competing interests exist.

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13. DATA AVAILABILITY STATEMENT

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14. ETHICS APPROVAL

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REFERENCE

- Ammari, T., Schoenebeck, S., & Morris, M. (2014, May). Accessing social support and overcoming judgment on social media among parents of children with special needs. In *Proceedings of the International AAAI Conference on Web and Social Media*, 8(1), 22-31. <https://doi.org/10.1609/icwsm.v8i1.14503>
- Barnett, D., Clements, M., Kaplan-Estrin, M., & Fialka, J. (2003). Building new dreams: Supporting parents' adaptation to their child with special needs. *Infants & Young Children*, 16(3), 184-200. <https://doi.org/10.1097/00001163-200307000-00002>
- Chia, K. H. (2013, June 7). Guard against caregiver stress syndrome. *The Straits Times* [Forum], p.A34.
- Freitag, L. (2017). *Extreme caregiving: The moral work of raising children with special needs*. New York, NY: Oxford University Press. <https://doi.org/10.1093/med/9780190491789.001.0001>
- Maul, C. A., & Singer, G. H. (2009). 'Just good different things' specific accommodations families make to positively adapt to their children with developmental disabilities. *Topics in Early Childhood Special Education*, 29(3), 155-170. <https://doi.org/10.1177/0271121408328516>
- Reebye, P., & Stalker, A. (2008). *Understanding regulation disorders of sensory processing in children: Management strategies for parents and professionals*. Philadelphia, PA: Jessica Kingsley Publishers. https://books.google.com.sg/books/about/Understanding_Regulation_Disorders_of_Se.html?id=NfFYuIW_9y_kC&redir_esc=y
- Wetherbee, K., & Philo, J. (2015). *Every child welcome: A ministry handbook for including kids with special needs*. Grand Rapids, MI: Kregel Academic. <https://www.amazon.com/Every-Child-Welcome-Ministry-Including/dp/0825443504>