

Empowering Autism Education with AI

Empowering Autism Education with AI:

*Tools for Learning,
Communication, and Growth*

By

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CHAPTER 1

UNDERSTANDING AUTISM AND LEARNING NEEDS

Characteristics of Autism

Autism Spectrum Disorder (ASD) refers to a broad range of traits that various individuals on the spectrum have. Although each autistic person is unique, some similar features can shape their learning needs and educational experiences. These qualities are generally based on three main areas: social interaction, communication, and repetitive behaviors or restricted interests (Eldridge et al., 2025).

Social Interaction Challenges

Most of the time, autistic kids face many challenges in social interaction, but it can be different for each in terms of the size and degree of difficulty. These problems may include being unable to start or keep a conversation, reading non-verbal signs, or having difficulties with social exchange with others. Groups like most autistic children struggle to make out what a person's face, body, or even the sound of their voice means, and will often make communication less effective (Bottema-Beutel, 2017). It may cause misunderstandings or loneliness.

Moreover, another critical phase is the imaginative and pretending phase, when the child begins to learn to take the perspective of others, to have a role in the game, and to think about what symbols represent. This is not only one of the most common problems in autism, but is also called a theory of mind disorder, where a person is not able to predict other people's actions and navigate social norms better. For example, they might sometimes suddenly join in on the conversation or be absorbed in a subject that they find interesting without realizing that they need to exchange their opinions with someone else.

Sometimes in group settings, like classrooms or playgrounds, those kids have even bigger problems. The high-speed and nonspecific nature of peer contact may be overpowering, making some kids silent or behave badly (Zhang et al., 2022). Others may want to socialize but be unable to gather the courage to relate to other kids or join group activities, so they end up being pushed away or being bullied.

Nevertheless, a significant number of autistic individuals who face such challenges are very likely to be motivated to make connections and can establish meaningful relationships with the appropriate help. Could this be a dip in social skills training or peer mentoring? According to Dr. Sullivan, autism affects only some parts of the brain (Sullivan et al., 2019). Students participate in inclusive classrooms and are respected for their unique abilities.

Communication Differences

Communication skills of autistic children differ significantly from one to another, representing the whole variety of the spectrum. Some kids remain non-verbal, or speak very little and effectively, while discovering alternative ways to communicate their needs (Chaidi and Drigas, 2020). These are things like Picture Exchange Communication Systems (PECS), sign language, or speech-generating devices, and they can be invaluable for non-speaking kids. With these students now able to communicate effectively, they can get involved and be more independent in both the social and educational settings.

Some autistic children may be verbal but have specific troubles related to verbal skills (Febriantini et al., 2021). For example, besides being unable to initiate or maintain conversation, they can be challenged by tones and context understanding and unable to grasp abstract language, such as idioms, metaphors, or sarcasm. Thus, a child might understand what is meant to be metaphorical, which might be wrong and misleading. For instance, phrases like “break a leg” might be taken seriously rather than seen as a humorous comment that means “good luck.”

The other side of the coin is pragmatic language deficit, besides social language problems, (Reindal et al., 2021). Autistic children might find the situation challenging, for example, when to start talking, how much information to give, or what language style to employ based on the listener’s character. For instance, they might go into great detail when discussing a

favorite topic while avoiding/denying/dismissing signs that the listener is uninterested.

Echolalia, the repetition of phrases and words, is an additional quirky behavior featured by many autistic individuals (Xie et al., 2023). Although it may sometimes be taken as a behavior difficulty, echolalia can be helpful in numerous ways, such as being a means for language processing, a form of communication, or a way of seeking reassurance. A clear understanding of the purpose of echolalia will help educators and caregivers react and interact correctly.

Moreover, the differences in non-verbal communication are also significant. Autistic children may use different gestures, facial expressions, or body language when interacting with neurotypical peers. Thus, their messages could be perceived and understood differently. For example, the lack of eye contact is often interpreted as not interested or stubborn; however, it may be the case of sensory discomfort or the choice to process information visually.

Teachers and caregivers can help autistic children by establishing environments that acknowledge and adjust to their communication habits. This could be done by providing visual aids, speaking more simply, providing clear and explicit instructions, or using technology to aid communication. Recognizing and appreciating various communication approaches is indispensable in ensuring the inclusion of people with autism and stimulating them to excel socially and academically.

Repetitive Behaviors and Restricted Interests

Repetitive behaviors and restricted interests are the main symptoms of ASD (Lung et al., 2024). Such attributes are reflected in different forms, such as repetitive body movements like hand flapping, rocking, or spinning and intense concentration on particular topics, objects, or activities. Although to an outsider, these behaviors might look odd, autistic individuals feel otherwise and see them as necessary mechanisms to help them function normally.

Repetitive behaviors could be an individual's way of looking for the familiar to make sense in a usually confusing atmosphere beyond their control (Manor-Binyamini and Schreiber-Divon, 2019). While a good number of autistic children benefit from these habits by way of grounding their feelings, reducing their anxiety, or managing their sensory overstimulation, gaining access to special interventions is the most significant challenge parents face. For instance, a child who rocks back and

forth may be soothing in a loud or chaotic environment. What educators and caregivers should bear in mind is that the function of the behavior is the main thing to be aware of. As a result, it drives them to the one that needs the reaction with understanding and support, not suppression.

On the other hand, exerting such obsessions is an overt show of excessive zeal and interest in a particular domain. Furthermore, they can range from the observation of natural as well as artificial systems like a metro train and a dinosaur to studying advanced mathematical connections or obscure historical epochs. Although some may see these concerns as having built-in restrictions, they are often the areas in which the person excels. For example, a child with a high level of interest in astronomy might show the quality and poise of the information far beyond their peers of the same age. The learning curve of restricting interests could be riveted into the teaching process of educators so as not to make learning difficult (Munroe and Dunleavy, 2023). Not only this, but they also connect math problems from a student's favorite subject that are interesting and more relatable, thus making the subject more engaging and enjoyable. For instance, a math problem around a child's favorite topic, such as trains, can make the subject more engaging and relatable.

However, repetitive behaviors and restricted interests may result in daily activities or learning difficulties. On the one hand, a child may be an expert in a specific topic or activity to such an extent that they find it hard to participate in another task or group activity. In these situations, a slow approach to the problem can be developed, and on the one hand, their attention can be narrowed, but on the other hand, it can be broader. Nevertheless, accepting and regarding repetitive behaviors and restricted interests as the main traits of autism can be a key to a more inclusive and efficient educational system. By exploring the value of these characteristics and integrating them into learning activities, teachers and parents can help autistic children develop their confidence and skills and reach their potential.

Sensory Sensitivities

It is common for autistic children to have an extreme sensitivity even to low or high levels of sensory stimuli. Some autistic children may be annoyed by blinding lights, deafening sounds, coffees that have a powerful smell, or super scratchy or slimy textures, making it impossible for them to complete tasks in the classroom (Jones, 2024). On the other hand, some kids get stressed due to the sensory input they get, like touching objects or moving

often. Sensory issues can significantly affect a child's behavior, level of comfort, and engagement in solitary and social activities.

Today, we are going to talk about sensitive children. It means that they can dislike or even feel uncomfortable, and it gives them severe pain. To illustrate, the brightness of fluorescent lighting or flickering, which makes them uncomfortable, and various textures of clothing, which result in irritation, can be distressing experiences for them. Also, sensory experiences can cause many problematic behaviors, such as meltdowns, distress, or stimulus avoidance (Jurevičienė et al., 2023). However, under-responsivity to sensory input can be a problem, too. This means that these kids will not quickly notice what is happening around them, for example, when someone calls them, or they may go looking for such experiences as spinning and crashing into objects that do not require their involvement.

Another way to help these kids is to use sensory-friendly strategies. Such activities as providing sensory breaks, offering noise-canceling headphones, or incorporating calming activities like deep-pressure exercises can teach children how to handle their sensory experiences through their help. In addition, a new era of environment-making has been created by predictable and organized environments that can decrease stress related to the senses, leading children to focus on learning and social interactions.

The need to identify and accommodate differences in the presentation of sensory deficits to create an inclusive educational environment should be recognized. Consequently, harnessing the knowledge of each individual's sensitive profile and then providing specific tailor-fitted interventions for the students in the classroom becomes the safest and most supportive way. Through the acknowledgment of such spaces, the classroom will not only be a place where all students can express themselves but also where they will feel secure, respected, and motivated to fulfill their learning goals.

Executive Functioning Difficulties

Autistic children often face executive functioning problems that involve planning, organization, and flexible thinking, which is a common issue that makes their school experiences worse. Some challenges children with ASD consistently encounter are starting an assignment, following several-step instructions, sticking to timetables, or adjusting to a new routine (Gappa, 2000). For instance, a child might find it hard to change from one activity to another or be confused about which job to do first from the list of tasks in a step-by-step manner in a particular environment. They may get anxious

or refuse because of the high tasks and changes. Also, neurodevelopmental deficits usually include memory-related issues, that is, a disability to hold on to the information learned in one situation for use in another.

Autistic children need visual schedules, step-by-step instructions, and adherence to the same routines to provide a predictable structure (AlSalehi and Alhifthy, 2020). Information such as time devices, checklists, or visual aids depicting each step to be accomplished can be helpful. Furthermore, teaching styles such as modeling, scaffolding, and positive reinforcement can provide executive function skills as they develop.

When parents and teachers create a predictable and transparent environment by emphasizing and respecting children's needs, they can play a critical role in enabling autistic kids to cope with executive functioning impairments. Sound adaptation and therapy can help children with ASD grow the skills that they need in their academic and daily lives with less help from others, with greater independence and confidence.

Current Educational Approaches

Educators have developed various methods for supporting autistic children in learning environments. These approaches are sometimes successful but often only address part of the needs.

Behavioral Interventions

Behavioral interventions are among the most widely used strategies for supporting autistic children in educational settings (Odom et al., 2021). These methods focus on understanding and modifying behavior to enhance learning and social skills. They aim to reinforce positive behaviors, reduce disruptive ones, and equip children with the skills to navigate academic and social environments effectively.

Applied Behavior Analysis (ABA)

Applied Behavior Analysis (ABA) is the best-known behavioral intervention implemented through parent training. ABA is based on the principles of operant conditioning, a learning process where behavior is modified by its consequences, rewarding the good and punishing the bad. For instance, a teacher might reward a child for completing a task or following a classroom rule, such as verbal praise, tokens, or a small prize. ABA programs are usually characterized by a highly structured and individualized setting with goals tailored to the child's needs (Weiss et al.,

2023). Among those could be discussing issues, following a lesson, and socializing. On the other hand, teaching self-regulation strategies may be another option. Data are also crucial at this point, as the ABA will be able to track the child's progress and make necessary changes if necessary.

While ABA is very effective in the long run in supporting autistic children to reach their developmental milestones, it has also been chastised. Some newer functionalities include running around in the house or being a surprise at a birthday party (Wacker et al., 2013). Children play the following games: Simon Says, cookie-cat-man, musical chairs, and tag games. They will get to know about the different parts of the machines interestingly. In the winter, they participate in a skating program where they will enjoy being with children of a similar age group. This type of party will be unique in that the children dress up in roles according to the themed story, and they take part in drama activities.

Positive Behavior Support (PBS)

Another approach that can be used to manage behavior is called Positive Behavior Support (PBS), which focuses on proactive strategies rather than reactive-only strategies (Hirschi, 2015). PBS is unlike the conventional methods of behavior management that only use punishment, which instead involves a deeper understanding of the triggers, and this would allow interventions such as punishment to be taken out of the equation. An example of its potential use is that a teacher can display a visual schedule for a child who manifests disruptive behavior during transitions or offer a preferred activity to address the problem with less difficulty.

In reality, Positive Behavior Support is inclusive of all educational practices as it results in the development of supportive spaces, which equate to all students being able to meet their needs regardless of an autism diagnosis. The preparation of this method can generate a culture of empathy among educators, caregivers, and peers.

Social and Emotional Learning (SEL)

SEL is Key for developing new skills through empathy, emotions, and conflict resolution. Behavioral interventions of the SEL programs are the junctions on the road to consistently achieving the aims of the SEL scheme, one of which is teaching children various essential skills, including empathy, emotional regulation, and conflict resolution (Sprague and Walker, 2021). Programs on social and emotional learning cannot match all their needs to the needs of autistic students. However, they might include

activities such as emotion recognition, perspective-taking, and helpful ways to express needs or concerns.

Such courses are compelling when integrated into the daily environment and reinforced with consistent practice. In this respect, a lesson that utilizes materials to teach students to identify and label their emotions accurately can be done. Moreover, role-playing scenarios can be used to practice solving conflicts.

Limitations of Behavioral Interventions

The behavioral interventions, although they have their advantages, still pose some problems (Meijer et al., 2023):

1. **Generalization Issues:** Skills developed in a structured environment are not always transferable to reality. In other words, a child might be great at using alternative to speech tools in speech therapy classes but unable to do the same at home or when interacting with peers.
2. **Time-Intensive Nature:** Behavioral interventions are usually long, laborious, and resource-intensive. Lack of resources, non-compliance, and other factors often become insurmountable obstacles for families and educators.
3. **Risk of Overemphasis on Deficits:** Behavioral interventions often place such enormous emphasis on correcting “the defects” that they forget about the child’s strengths. Thus, such an approach entails some risk of the autism disorder becoming seen exclusively as a negative attribute.
4. **Ethical Considerations:** Opponents of the ABA approach argue, among other things, that imposing generic solutions on children is tantamount to performing experiments on human beings without their consent. Therefore, it is essential to guarantee interventions that value the right to make decisions and the dignity of individuals with autism.

Moving Forward

Interventions designed to change behaviors are still essential to help autistic children, but it is crucial to use them properly, carefully treating each patient as an individual. By using these methods jointly with technology development, like AI, in future chapters, educators and caretakers will be able to boost the effect they have on the kids and, at the same time, fix the imperfections of how they function. In the most recent years, the methods

used must incorporate cooperation and diversity, and, as a result, it is the way to show every child how to succeed in a setup designed to satisfy their different needs.

Specialized Education Plans

Specialized education plans, like Individualized Education Programs (IEPs) and 504 Plans, are indispensable tools for enabling special students (Hustus et al., 2020). The plans' main goal is to offer highly personalized interventions and special accommodations and set specific objectives so that the students can complete the curriculum and achieve as much as possible.

Individualized Education Programs (IEPs)

An IEP is a legally binding document created for students who qualify for special education services under the Individuals with Disabilities Education Act (IDEA) (Russo, 2019). It outlines a student's specific learning needs, annual goals, and the services and accommodations required to meet those goals. Key components of an IEP include:

1. **Present Levels of Performance (PLOP):** A detailed description of the child's academic, social, and behavioral functioning. This serves as a baseline for setting measurable goals.
2. **Annual Goals:** Specific, measurable, achievable, relevant, and time-bound (SMART) objectives tailored to the student's needs. For example, a goal might improve social communication or develop self-regulation skills.
3. **Services and Accommodations:** The IEP specifies the types of support the child will receive, such as speech therapy, occupational therapy, or specialized instruction. Accommodations might include extended test time, preferential seating, or assistive technology.
4. **Progress Monitoring:** Regular assessments to evaluate the student's progress toward their goals. These evaluations help ensure that the IEP remains relevant and effective.

IEPs are developed collaboratively by a team that includes educators, specialists, parents, and, when appropriate, the student (Nayyar and Kashyap, 2024). This collaborative process ensures that the plan reflects the child's strengths, challenges, and aspirations.

504 Plans

Unlike IEPs, which provide specialized instruction, 504 Plans are designed to ensure that students with disabilities have equal access to education (Lovett, 2021). They are covered under Section 504 of the Rehabilitation Act of 1973 and typically focus on accommodations rather than specialized services (Bateman et al., 2020). For example, a 504 Plan might include:

- Adjustments to the physical environment, such as providing a quiet workspace.
- Curriculum modifications, such as simplifying instructions or reducing the number of assignments.
- Behavioral support strategies, like providing a visual schedule or break times.

504 Plans are often less comprehensive than IEPs, but are valuable for addressing specific needs and reducing barriers to learning (Eichorn, 2021).

Benefits of Specialized Education Plans

Autistic students' requirements facilitate the achievement of equity and inclusion through directed instructional methods (Adako et al., 2024a, Adako et al., 2024b). They ensure that:

- Learning is individualized: By identifying the child's strong and weak points, the child is likely to improve, and thus, the plans the teacher creates are more feasible.
- Progress is measured: Regular checks serve as metrics to monitor growth and alter tactics accordingly.
- Support is Consistent: Educational workers, parents, and therapists collaborate to maintain a consistent approach to learning.

Limitations and Challenges

Despite their benefits, specialized education plans face several challenges:

1. Resource Limitations: Many schools lack sufficient financing, staff, or training to complete the execution of IEPs or 504 plans, which can result in problems with inadequate support and service delays.
2. Inconsistent Implementation: The workers' competence and dedication can significantly affect the quality of the plan. Differences in carrying out the plans may generate varying outcomes.

3. **Focus on Deficits:** Though the main catch of planning is to aid in solving specific difficulties, they can still miss the point by overemphasizing the weaker aspects of the child in comparison to the strengths and interests themselves.
4. **Parental Advocacy:** Getting and keeping a special education plan can be intricate and time-consuming. The parents, therefore, have to be the main actors who advocate the process.
5. **Transition Challenges:** Supporting young people throughout various grades or schools becomes quite complex when promoting consistent and cohesive educational plans. It may not be easy.

Moving Forward

To maximize the effectiveness of specialized education plans, educators and policymakers must address these challenges by:

- Providing ongoing training for teachers and staff to improve their understanding of autism and effective teaching strategies.
- Allocating resources to ensure that schools have the tools and personnel needed to implement plans effectively.
- Fostering a strength-based approach that celebrates the unique abilities and interests of autistic students.
- Simplifying the process for families to access and advocate for these plans.

When well-designed and implemented, specialized education plans can empower autistic students to thrive in educational settings. As advancements in technology, including AI, become integrated into education, these plans can be further enhanced to provide even more personalized and effective support, as discussed in later chapters.

Social Skills Training

Social Skills Training (SST) is a targeted intervention that is aimed at giving support to autistic individuals by assisting them in their effort to build and maintain their social skills positively (Dubreucq et al., 2022). Owing to the inherent issues so many autistic children have in social communication and interpersonal collaboration, SST takes an indispensable role in getting them equipped with the possibilities of being able to construct the relationships

they need to, partners, collaborate with them, and finally, join them in community activities in a meaningful manner.

Key Components of Social Skills Training

1. **Identifying Core Skills:** SST interventions usually start by identifying specific social skills that need to be developed, like eye contact, starting a conversation, turn-taking, or being aware of social norms. The skills honed are targeted at the individuals' age, capabilities, and social environment.
2. **Structured Teaching:** Every social skill is pulled into its constituent parts and taught separately. For example, the steps included in the initiation of a conversation might be the approaches of the individual, such as making a friendly greeting and asking a simple question.
3. **Role-Playing and Practice:** Role-play scenarios are a resource that facilitates a fright-free, very well-controlled environment where participants can have an opportunity to develop their social skills without the fear of being judged. Children can practice in a guided setting where they pretend to be a part of a group activity or mediate in resolving a conflict with a peer.
4. **Feedback and Reinforcement:** Instantaneous feedback helps participants understand what they have done right and what else they can work on. Praise or rewards are used as positive reinforcement to motivate the newly learned skills.
5. **Generalization:** The primary task of SST is to transfer the skills that patients have learned at an inpatient facility to their day-to-day lives. For this, they often provide opportunities to practice within naturalistic environments, such as playgrounds, classrooms, or community settings.

Benefits of Social Skills Training

1. **Improved Communication:** SST can help children develop clearer and more effective ways of expressing themselves verbally and non-verbally. For instance, they might learn how to ask for help or appropriately express their feelings.
2. **Enhanced Peer Relationships:** Children can form meaningful connections with their peers by learning how to initiate and maintain friendships. This fosters a sense of belonging and reduces feelings of isolation.

3. **Increased Confidence:** Mastering social interactions can boost self-esteem, making children more willing to engage in social situations and take on new challenges.
4. **Better Classroom Dynamics:** Improved social skills can create a more positive classroom environment. For example, children working cooperatively with others can better participate in group projects or follow classroom rules.

Challenges in Implementation

1. **Individual Variability:** Social skills needs vary widely among autistic individuals, requiring programs to be highly personalized. What works for one child may not be effective for another, necessitating ongoing assessment and adjustment.
2. **Skill Generalization:** As mentioned, transferring skills from training sessions to real-world situations can be difficult. Without consistent practice and reinforcement in everyday settings, gains made during training may not be sustained.
3. **Resource Constraints:** Effective SST requires trained professionals, time, and materials, which may be limited in specific educational or community settings.
4. **Stigma and Acceptance:** Some children may be reluctant to participate in SST due to fear of being singled out or labeled. Educators and families must work to create a supportive environment that normalizes and celebrates skill-building.

Innovations and Future Directions

Advancements in technology, including virtual reality (VR) and artificial intelligence (AI), are opening new possibilities for social skills training. For example:

- **VR Simulations:** Virtual environments can simulate real-world social scenarios, allowing children to practice skills in a realistic yet controlled setting (Oranç and Küntay, 2019). These simulations can be customized to address specific challenges and provide immediate feedback.
- **AI-Powered Coaching:** AI-driven tools can analyze speech, facial expressions, and body language to provide personalized feedback during social interactions (Habibi et al., 2025). These tools can also adapt to the individual's progress, offering more targeted support.

When thoughtfully implemented, social skills training holds immense potential for helping autistic children navigate the complexities of social interaction (Adako et al., 2024a). Combining evidence-based strategies with emerging technologies can create more effective and inclusive programs that empower these children to thrive in diverse social environments.

Sensory-Friendly Classrooms

Sensory-friendly classrooms are purposefully built to suit the sensory needs of students with autism, who generally either have heightened or diminished sensitivity to the environment (Lawlor, 2019). Such environments aim to create an atmosphere of care and inclusivity where students of all sensory preferences can excel academically and socialize with friends.

Key Features of Sensory-Friendly Classrooms

1. **Lighting Adjustments:** One of the many causes of fatigue in autistic kids is too much light. Sensory-friendly classrooms have various light adjustment options: try dimmable lights, windows to let the sun in, or warm-colored lights, which will create a more relaxing vibe. Filters and covers can also reduce strain and strobe, two primary issues causing sensory unpleasantness.
2. **Sound Management:** Loud and sudden noises can be stressful for children. To solve this problem, classrooms may have noise control elements such as soundproofing, acoustic panels, or carpets capable of absorbing those sounds or avoiding echoing. Part of the solution is noise-canceling headphones and the fact that there are some corners within the classroom where students can isolate themselves when they feel overstimulated.
3. **Flexible Seating Options:** In sensory-friendly classrooms, myriad seating arrangements are offered to ensure each child has the best place to focus and regulate sensory input. The selections can include bean bags, rocking chairs, standing desks, or even stability balls. Students have the option to take any number of seats that help them concentrate and make them feel comfortable.
4. **Calming Zones:** Designated quiet spaces or sensory corners provide a retreat for overwhelmed students. These areas have soothing tools, such as weighted blankets, fidget toys, or calming visuals, to help students self-regulate.
5. **Visual Supports:** Many autistic students use visual cues to understand routines and expectations. Sensory-friendly classrooms incorporate visual schedules, clear labels, and instructional charts to provide

structure and clarity. Color-coded materials and organized layouts can further reduce visual clutter, making it easier for students to focus.

6. **Texture and Material Considerations:** Classrooms may include sensory-friendly materials, such as soft fabrics or smooth surfaces, to accommodate tactile sensitivities. Avoiding rough or irritating textures, particularly in classroom furniture or supplies, helps create a more comfortable environment.

Benefits of Sensory-Friendly Classrooms

1. **Improved Focus and Engagement:** The class provides resources that decrease the sense of distraction and stress, thus encouraging the students to concentrate more and more and participate objectively in the class activities.
2. **Enhanced Emotional Regulation:** Students are given strategies about sensory features so that they have an alternative in the case of an emotional upsurge. For instance, they use tools for sensory-related self-help instead of melting down.
3. **Increased Inclusion:** A sensory-friendly place is a real opportunity for autistic and otherwise sensory-sensitive kids to have the same options as their mates.
4. **Reduced Behavioral Challenges:** Many autistic students remain misunderstood because most of their behavioral issues arise from sensory challenges that are not easy to identify. Addressing these issues entails building a flexible and supportive environment that will most likely make the class a peaceful entity.

Challenges in Implementing Sensory-Friendly Classrooms

1. **Resource Limitations:** Retrofitting classrooms and buying appropriate tools can be very expensive, and it may not be affordable for some schools to provide any of the necessary sensory-friendly features.
2. **Lack of Awareness and Training:** Several teachers and administrators might not appreciate or implement the essence of helpful sensory provisions correctly.
3. **Balancing Diverse Needs:** Stumbling into the scenario that there are different sensory preferences in the class pushes the teacher towards the idea that the problems that were worried about can be solved through such common ones as a quiet space for one and movement

for the second one. The other one may be intelligent by nature, so they must use sound at least moderately.

Future Directions

The aforementioned strides in technology have changed the face of some educational topics. The catchwords of this change might be:

- **Smart Classroom Technology:** AI-powered technologies that adjust lighting, sound, and temperature in real-time based on student requirements.
- **Wearable Sensors:** Gadgets that track essential physiological data, such as heart rate or skin temperature, in cases of stress, for example, will alert the class teacher if a student requires sensory assistance.
- **Sensory-friendly classrooms** leap forward in the same direction, aiming to make the educational environment open and inclusive. Even by eliminating environmental barriers, the comfort and confronting of autistic students are already improved, which in turn will prevent them from being left behind in the empathy and diversity curve.

Limitations of Current Approaches

Research has shown that specialized prevention and treatment methods have been effectively used to provide more meaningful educational experiences to autistic kids. However, these efforts still have several drawbacks. Such issues include:

Resource Constraints

The lack of resources is the main thing that prevents the application of an effective educational strategy for autistic students. The problems that many schools and other academic institutions encounter are ordered in the following table:

- **Financial Problems:** Quality educational programs and materials, as well as skilled instructors, need a certain level of funding that may not be achievable in certain areas, such as poor neighborhoods (Fletcher et al., 2022).
- **Lack of Personnel:** Autism is a highly demanding disorder. There are not enough qualified, experienced staff members to teach and help these children (Du Preez, 2024).

- **Scarcity of Assistive Technology:** Despite technology's potential to revolutionize autism education, many schools lack the capacity or necessary knowledge to integrate the added tools (Du Preez, 2024).

Inconsistent Implementation

Autistic students are being taught in class using a plethora of different tactics, which can bring about marginal improvements to their situation. There are different opportunities for innovation characteristic of the types of learning possibilities that students in those educational systems have:

- **Special Skills:** Teachers and staff must share a common understanding of consistent (correct the non-word) and evidence-based practices, leading to the proper implementation of interventions (Dockrell et al., 2017).
- **Lack of Standardization:** Although frameworks such as IEPs and 504 Plans provide a structure, their effectiveness ultimately lies in how they are tailored and the level of successful execution by the educational team, (Yell et al., 2021, Brinkman, 2023).
- **Fragmented Services:** Coordination between schools, families, and external therapists is often insufficient, leading to gaps in support (Nuske et al., 2019).

Focus on Deficits

Many current approaches emphasize addressing perceived deficits in autistic children rather than building on their strengths and unique abilities. This deficit-focused mindset can:

- Undermine self-esteem and confidence in autistic learners.
- Overlook the value of neurodiversity and the potential contributions of autistic individuals.
- Limit opportunities for fostering creativity, innovation, and independent problem-solving skills.

Limited Generalization of Skills

Skills learned in structured classroom settings or therapy sessions often fail to transfer to real-world contexts, a phenomenon known as limited generalization (Schmidt and Glaser, 2021). For instance:

- Social skills training might succeed in simulated scenarios but may not translate to unstructured environments like playgrounds or family gatherings.
- Behavioral interventions may not account for the complexities and unpredictability of everyday life.

Inadequate Family Support and Training

Families play a crucial role in reinforcing skills and supporting autistic children at home, (Galpin et al., 2018). However:

- Many parents and caregivers do not receive adequate training or resources to implement educational strategies outside school.
- The lack of guidance can lead to inconsistent support, making it harder for children to maintain progress.

Insufficient Cultural Sensitivity

Current approaches often fail to account for cultural and socioeconomic differences that influence how autism is perceived and addressed (Singh and Bunyak, 2019):

- Stigma and lack of awareness in specific communities can discourage families from seeking or advocating for support.
- Educational practices and interventions may not be adaptable to the cultural values or languages of diverse populations.

Overemphasis on Standardized Testing

Educational systems that prioritize standardized testing can disadvantage autistic students, who may struggle with traditional assessment formats due to sensory sensitivities, anxiety, or communication challenges (O'Hagan, 2020). This focus often leads to:

- Narrow definitions of success that overlook the unique talents and achievements of autistic learners.
- Pressure on students and educators to meet rigid benchmarks at the expense of personalized, meaningful learning experiences.

Ethical and Privacy Concerns

The growing use of technology in autism education raises critical ethical questions:

- **Data Privacy:** Collecting and storing sensitive information about autistic students can pose risks if not handled securely.
- **Over-reliance on Technology:** While technology can enhance learning, it is not a substitute for human interaction and emotional connection, which remain essential for holistic development.

Transition Challenges

As autistic students move through different educational stages or transition to adulthood, many face significant challenges (Anderson et al., 2018):

- **Inadequate preparation for life beyond school,** including higher education or employment.
- **Limited focus on developing practical, independent living skills.**
- **Lack of continuity in support services during transitions.**

Moving Forward

Addressing these limitations requires a multifaceted approach that includes:

- **Increased Funding:** Governments and organizations need to prioritize investments in autism education to provide schools with the resources they need.
- **Comprehensive Training:** Educators and staff must receive ongoing professional development to implement evidence-based practices effectively.
- **Strength-Based Approaches:** Shifting the focus to building on strengths and fostering autonomy can empower autistic students and promote positive self-identity.
- **Technology Integration:** Expanding access to adaptive technologies while addressing ethical concerns can enhance personalization and engagement.
- **Family Involvement:** Providing resources and training for families ensures consistent support across home and school environments.
- **Cultural Competency:** Tailoring interventions to diverse cultural and socioeconomic contexts can improve accessibility and relevance.

By overcoming these limitations, educational systems can better meet the needs of autistic students, fostering an inclusive environment where every learner can succeed.

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