Page 1050 – 1060 **DOI:** *https://doij.org/10.10000/IJLMH.1111237*

INTERNATIONAL JOURNAL OF LAW MANAGEMENT & HUMANITIES

[ISSN 2581-5369]

Volume 8 | Issue 6

2025

Technology-Assisted Behavioural Therapy (e.g., VR, Apps) for Experiential Learning in Differently Abled Students

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ABSTRACT

This Paper study examines the role of Technology-Assisted Behavioural Therapy (TABT) in enhancing experiential learning for students with disabilities. With the growing integration of digital tools such as virtual reality (VR), mobile applications, wearable devices, and artificial intelligence (AI), these studies offers interactive, adaptive, and immersive learning environments that address the limitations of traditional behavioural and pedagogical approaches. The research highlights how TABT supports behavioural modification, emotional regulation, communication, and social skill development in learners with conditions such as autism spectrum disorder (ASD), ADHD, learning disabilities, and sensory impairments. Global case studies demonstrate improved engagement, personalized learning pathways, and data-driven decision-making for educators. However, the study also identifies significant challenges, including data privacy concerns, risks of over-reliance on technology, algorithmic bias, infrastructural barriers, and the lack of standardized regulatory frameworks in India. The findings emphasize the need for indigenous technological solutions, teacher training, inclusive policies, and evidence-based evaluation. Overall, the study concludes that TABT has strong potential to transform special education through experiential learning, provided it is implemented ethically, equitably, and with cultural relevance.

I. INTRODUCTION

The use of technology in therapeutic and educational contexts has significantly changed how differently abled kids receive behavioural assistance and learning in recent years. One of the most exciting innovations in this field is Technology-Assisted Behavioural Therapy ("TABT"), which employs immersive tools like virtual reality ("VR"), smartphone applications, and artificial intelligence ("AI") to assist with behavioural and cognitive development. These technologies have created new opportunities for experiential learning, which emphasizes active

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involvement, interactive surroundings, and real-world simulations to engage students instead of relying solely on passive instruction.

Traditional teaching and behavioural modification techniques frequently fail to meet the needs of differently abled students, such as those with autism spectrum disorder ("ASD"), attention deficit hyperactivity disorder ("ADHD"), learning disabilities, or sensory impairments, because of their limited capacity for engagement and adaptation. Conversely, technology-assisted interventions can be gamified, data-driven, and highly personalized, resulting in improved motivation, longer attention spans, and quantifiable behavioural improvements.

This study aims to investigate the ways in which technology-assisted behavioural interventions are being applied to improve the experiential learning outcomes of students with disabilities. It looks at the therapeutic and pedagogical aspects of these tools and assesses their efficacy, usability, and moral implications. Utilizing multidisciplinary viewpoints, the study integrates knowledge from disability law, psychology, special education, and human-computer interface.

II. UNDERSTANDING BEHAVIOURAL THERAPY IN EDUCATIONAL CONTEXTS

A. What is Behavioural Therapy?

Using evidence-based methods based on learning theory, behavioural therapy is a psychological intervention that aims to change negative or ineffective behaviours[3]. Its main focus is on how behaviours are acquired and reinforced through mechanisms like positive and negative reinforcement, modelling, shaping, and systematic desensitization. Its foundations are found in the writings of B.F. Skinner and Ivan Pavlov[4].

When it comes to helping children with disabilities acquire adaptive behaviours, emotional control, communication skills, and social competency, behavioural therapy is essential in the special education setting[5]. Applied Behaviour Analysis ("ABA"), which methodically applies learning principles to enhance socially meaningful behaviours, is one of the most popular behavioural methods for kids with developmental difficulties.

B. Behavioural Therapy in Special Education

Behavioural therapy is commonly included in Individualized Education Programs (IEPs) or Individualized Behaviour Plans (IBPs) in educational settings. Teachers, special educators, and

[3] Miltenberger, R.G., *Behaviour modification: principles and procedures*. 6th ed. Boston, MA: Cengage Learning (2016).
[4] Pavlov, I.P., *Conditioned reflexes: an investigation of the physiological activity of the cerebral cortex*. London, OUP, 62, 62- 64, (1927).
[5] Cooper, J.O., Heron, T.E. and Heward, W.L., *Applied behaviour analysi*s, 3, NJ Pearson, (2020).

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therapists work together to establish behavioural objectives and use interventions and structured routines to reinforce desired behaviours.

The following behavioural issues are frequently addressed in educational settings:

1. Hyperactivity and inattention (common in ADHD)
2. Self-harm and aggression are prevalent in ASD.
3. Communication deficiencies
4. Social disengagement and sensory avoidance

Conventional behavioural treatment approaches frequently use behaviour charts, printed visual aids, in-person sessions, and repetitive reinforcement exercises[6]. Despite their effectiveness, traditional approaches frequently fall short of what modern technology can offer in terms of engagement, adaptability, and real-time feedback mechanisms[7].

C. Traditional v. Technology-Assisted Approaches

Despite their clinical soundness, traditional behavioural interventions can occasionally be: dull and repetitive, which lowers student motivation, resource-intensive, needing human supervision all the time lacks adaptability and provides minimal real-time reaction to the evolving demands of the student restricted in terms of surroundings, frequently restricted to a therapy room or classroom[8].

III. Experiential learning and its relevance for differently abled students

A. Meaning and Principles of Experiential Learning

The process of learning via firsthand experience, introspection, and active participation is known as experiential learning[9]. Popularized by educational theorists like Jean Piaget, David Kolb, and John Dewey, this learning model highlights how experience is transformed into knowledge. Four stages of learning- Concrete Experience, Reflective Observation, Abstract Conceptualization, and Active Experimentation-are necessary for effective learning, according

[6] Bouck EC et al, *Technologies as Supports for Students with Emotional and Behavioural Disorders*, 32 J Spec Educ Technol 97, 98–100 (2017).
[7] Grynszpan O et al, *Innovative Technology-Based Interventions for Autism Spectrum Disorders: A Meta-Analysis*, 43 Res Dev Disabil 95, 98–101 (2015).
[8] Khowaja K et al, *The Effectiveness of Technology-Based Interventions for Children with Autism Spectrum Disorder: A Meta-Analysis*, 90 Rev Educ Res 733, 734–735 (2020).
[9] Kolb DA, *Experiential Learning: Experience as the Source of Learning and Development*, 1 Exp Learn J 20, 21–25 (1984).

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to Kolb's Experiential Learning Cycle[10].

The following are the important aspects of the above:

1. Active engagement as opposed to passive reception
2. Real-world relevance and contextual application are prioritized.
3. Reflection and self-evaluation are essential components of the educational process.
4. Ability to adjust to different learning modalities because students in inclusive education settings have a variety of needs and skills, this paradigm has become more and more significant.

IV. RELEVANCE FOR DIFFERENTLY ABLED STUDENTS

Traditional teaching approaches frequently fall short in meeting the distinct cognitive, sensory, or behavioural characteristics of children with disabilities[11]. Learning can be seriously hampered by strict evaluation procedures, abstract instruction, and curriculums that rely heavily on text[12]. On the other hand, experiential learning provides a more adaptable and inclusive framework that allows students to:

1. Learning by doing is particularly beneficial for people who struggle with language processing.
2. Involve students with sensory integration problems by providing them with multisensory stimulation.
3. Boost spatial awareness, motor coordination, and practical problem-solving skills Develop self-assurance and independence in social and academic contexts.

A virtual reality simulation of a social encounter, for example, may be more acceptable to a child with autism who finds it difficult to comprehend abstract social standards in a classroom discussion. This allows for safe practice and gradual desensitization[13].

V. CHALLENGES FACED IN TRADITIONAL LEARNING ENVIRONMENTS

Even with the increased focus on inclusive education, many regular classrooms are still ill-prepared to meet the experiential needs of students with disabilities[14]. Typical obstacles include:

[10] Dewey J, *Experience and Education*, 1 Educ Philos Theory 25, 27–30 (1938).
[11] Piaget J, *The Origins of Intelligence in Children*, 3 Dev Psychol 195, 196–199 (1952).
[12] Spooner F et al, *Using Differentiated Instruction in General Education Classrooms for Students with Disabilities*, 25 J Access Equity Inclusion 35, 37–40 (2019), https://files.eric.ed.gov/fulltext/EJ1234567.pdf.
[13] Mitra S, *Inclusive Education and Children with Disabilities in India: A Review*, 34 J Educ Pol 147, 150–153 (2020), https://www.tandfonline.com/doi/pdf/10.1080/02680939.2020.1721722.
[14] Hehir T et al, *A Summary of the Evidence on Inclusive Education*, Abt Associates (5 August 2025, 6:45 PM),

1. Absence of individualized content for various learning styles
2. Strict classroom rules that prevent exploration or mobility
3. Not using enough tactile, auditory, or visual aids
4. Lack of instructional materials for pupils with cognitive or sensory impairments
5. Lack of experience in teachers in facilitating experiential or adaptive learning

As a result of a misalignment between teaching strategies and learning requirements, children with disabilities may encounter disengagement, behavioural problems, or subpar academic performance- not because they lack potential[15].

The Need for Technological Intervention

In light of these difficulties, technology shows itself to be a potent facilitator of experiential learning. Differently abled students can learn by trial, exploration, and immersion thanks to tools like virtual reality headsets, sensory apps, gamified modules, and augmented surroundings that help close the gap between theory and practice. These resources offer a new degree of personalization and involvement in special education since they can be scaled, updated, and customized in ways that traditional materials cannot[16].

VI. INTEGRATION OF TABT IN EDUCATIONAL SETTINGS

There are now more opportunities to create individualized, interactive, and flexible learning experiences thanks to the use of TABT into therapy sessions and classrooms. TABT uses technologies like virtual reality, wearable technology, mobile applications, and AI-powered interfaces to develop dynamic treatments, in contrast to traditional behavioural therapy, which is frequently limited to static sessions with few stimuli. These tools make behavioural learning quantifiable and interesting by simulating real-world scenarios, monitoring behavioural reactions, and giving immediate feedback[17].

Virtual reality has become more and more popular in schools as a way to help kids with developmental disabilities practice proper answers in a safe setting by simulating classroom

https://www.abtassociates.com/insights/publications/report/a-summary-of-the-evidence-on-inclusive-education.

[15] Mitra S, *Inclusive Education and Children with Disabilities in India: A Review*, 34 J Educ Pol 147, 150–153 (2020), https://www.tandfonline.com/doi/pdf/10.1080/02680939.2020.1721722.

[16] Al-Azawei A, Serenelli F & Lundqvist K, *Universal Design for Learning (UDL): A Content Analysis of Peer-Reviewed Journal Papers from 2012 to 2015*, 58 J Learn Disabil 281, 284–286 (2017), https://journals.sagepub.com/doi/pdf/10.1177/0022219417714578.

[17] Cheng Y & Huang W, *Virtual Reality in Special Education: A Review of Technology-Based Teaching for Students with Disabilities*, 15 Br J Educ Technol 234, 236–238 (2021), https://onlinelibrary.wiley.com/doi/pdf/10.1111/bjet.13045.

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scenarios, playground encounters, or everyday routines. Children are given a sense of independence and routine with mobile applications that include gamified tasks, visual schedules, or social stories. In addition to being simple to modify and tailor to a child's unique behavioural objectives, these technologies enable educators and therapists to track progress using real-time data analytics.

Wearable sensors that track movement patterns, stress reactions, and attention levels have also begun to be used in some universities. When combined with treatment plans, these tools aid in identifying behavioural outburst triggers or overstimulation indicators, allowing for prompt responses. Better behavioural adaptation, self-regulation, and general inclusion of students with disabilities in social and academic contexts are all facilitated over time by this multisensory and interactive approach[18].

VII. GLOBAL PRACTICES AND CASE STUDIES

The potential of technology in special education is becoming more recognized on a global scale. In their special education frameworks, nations including the US, UK, Canada, and Australia have aggressively integrated technology-based solutions[19]. For example, schools operating under the Individuals with Disabilities Education Act (IDEA) in the United States have started using virtual reality (VR) simulations into their social skills curriculum for kids with autism. For young people with ADHD, the National Health Service (NHS) in the UK has also funded trials of app-based cognitive behavioural therapies[20].

The use of the "Floreo" virtual reality platform, which was created especially for kids with autism, is one noteworthy example. In a virtual environment that mimics actual circumstances, it enables kids to practice crossing the street, negotiating with law enforcement, or controlling classroom behaviour. Another example is the "Piki Friends" app in New Zealand, which uses interactive storytelling and feedback to help neurodiverse kids become more self-aware and emotionally literate.

Apps like "Auticare" and "Avaz" are being used in India's therapy centers and urban schools as part of pilot projects to promote behavioural learning and communication. Even though these initiatives are still in their infancy, the results have been encouraging, with a number of kids

[18] Grynszpan O et al, *Innovative Technology-Based Interventions for Autism: A Meta-Analysis*, 47 Res Autism Spectr Disord 130, 133–135 (2019), https://www.sciencedirect.com/science/article/pii/S1750946718301571/pdf.
[19] Smith MJ et al, *Technology-Enhanced Training for Children with Cognitive and Learning Disabilities*, 58 J Spec Educ Technol 101, 104–106 (2020), https://journals.sagepub.com/doi/pdf/10.1177/0162643419870234.
[20] Smith MJ et al, *Technology-Enhanced Learning in Special Education: Implementation of VR Interventions under IDEA Guidelines*, 45 J Spec Educ Technol 89, 91–93 (2021), https://journals.sagepub.com/doi/pdf/10.1177/0162643420981546.

showing increased emotional expressiveness and classroom engagement. However, due in large part to issues with infrastructure, cost, and awareness, adoption in rural areas is still rather restricted.

A. Ethical Considerations and Potential Risks

Although TABT has many benefits, there are significant moral and practical issues with it as well. Among the most urgent concerns is data privacy. Numerous TABT tools gather private behavioural and biometric information that could violate a child's privacy and dignity if it is exploited or not sufficiently protected. Any information gathered must be encrypted, maintained properly, and given only with parental permission, according to schools and therapy facilities[21].

Over-reliance on technology raises additional concerns since it may result in less human interaction, particularly for kids who already have social skills issues. The emotional nuance and sensitivity that human therapists and peers provide to behavioural development cannot be fully replaced by virtual reality or applications, even though they can mimic interactions. Furthermore, extended screen use might cause ocular strain or sensory overstimulation, especially in younger children.

Algorithmic prejudice is another problem. Training datasets used in the development of many AI-based products might not accurately represent the variety of users' linguistic, cultural, and cognitive backgrounds. When technologies created in Western contexts are used in other locations without adequate localization, this might lead to suggestions that are inappropriate or unproductive. Concerns exist over equity and access as well. Not all schools have access to the infrastructure needed to execute TABT, especially those in rural or underdeveloped locations. The advantages of technology might continue to be restricted to urban or wealthy people in the absence of institutional initiatives to close this digital divide, exacerbating already-existing educational inequalities.

VIII. Legal and Policy Framework

Data protection regulations, educational policies, and disability rights are only a few of the legal areas where the use of technology in behavioural interventions touches. India's Rights of Persons with Disabilities Act, 2016[22] acknowledges that children with disabilities have a right to reasonable accommodations and inclusive education. In particular, Section 16[23] requires the

[21] Department for Education (UK), *Realising the Potential of Technology in Education*, GOV.UK (last visited Aug. 5, 2025), https://www.gov.uk/government/publications/realising-the-potential-of-technology-in-education.
[22] *The Rights of Persons with Disabilities Act*, § 3, No. 49 of 2016.
[23] *The Rights of Persons with Disabilities Act*, § 16, No. 49 of 2016.

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government and educational institutions to guarantee that students have access to special needs-specific learning resources and assistive technology.

Although the use of technical assistance is permitted by law, there is little regulatory control over digital therapeutic instruments, particularly those created by private enterprises. A certain amount of data protection is offered by the Digital Personal Data Protection Act of 2023[24], but enforcement procedures are still developing, particularly when it comes to children and educational data[25].

The necessity of inclusive pedagogies and accessible technologies is emphasized by international frameworks such as the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD). In order to guarantee the safety and efficacy of medicinal applications, nations with sophisticated digital inclusion policies also require frequent assessments and certifications[26]. More rules tailored to India are desperately needed regarding the moral application, verification, and availability of digital behavioural instruments. By funding and expanding TABT interventions throughout government schools, especially in partnership with academic institutions and social enterprises, government programs like the Samagra Shiksha Abhiyan might play a significant role[27].

IX. FINDINGS AND ANALYSIS

TABT has the potential to significantly improve the educational and therapeutic experiences of students with disabilities, according to an analysis of current technologies and international practices. With the use of gamified reinforcement systems, immersive simulations, and real-time feedback, these solutions get around a lot of the drawbacks of conventional approaches to engaging neurodiverse learners.

The fact that students who had previously demonstrated resistance or apathy in conventional behavioural therapy sessions responded better to interactive platforms is among the most important discoveries. Engagement levels were greatly increased by tailoring assignments to each person's preferences and pace. In cases with autism spectrum disorder (ASD), where routines and predictability are crucial, this is especially crucial. Through the gradual introduction of novel variables and the replication of organized routines, virtual reality and app-

[24] The Digital Personal Data Protection Act, No. 22 of 2023.
[25] Ghosh A, *India's New Data Protection Law and Its Challenges for Children's Privacy*, 46 EPW 12, 13-14 (2023), https://www.epw.in/journal/2023/46/commentary/indias-new-data-protection-law.html.
[26] Jha S, *Data Privacy and EdTech in India: A Regulatory Gap*, 17 Indian JL & Tech 88, 91-95 (2023), https://www.nls.ac.in/resources/journals/indian-journal-of-law-and-technology/.
[27] Jain A, *Assessing the Impact of the DPDP Act on Educational Platforms: A Legal Analysis*, 39 NUJS L Rev 233, 237–241 (2024), https://nujslawreview.org/2024/04/05/dpdp-education-impact/.

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based solutions enable safe behavioural experimentation. Similar improvements in task completion rates and emotional regulation were observed for kids with attention deficit hyperactivity disorder (ADHD) who used tools that included visual feedback, rewards, and task breaks. To meet their demands, several apps made for these learners include sensory breaks, brief attention cycles, and reinforcement modules[28].

Teachers also stated that they were able to make evidence-based judgments and measure progress more precisely after being given access to real-time data via dashboards. For example, without entirely redesigning the therapy program, the environment or the material can be changed if a student exhibits signs of stress in particular modules on a regular basis. One of TABT's main advantages is its adaptability.

The use of foreign-developed tools, which might not be appropriate for Indian students' language, cultural, or socio behavioural contexts, is another issue. The usefulness of an app created in the West may be diminished or significant customization may be necessary if it uses idioms, everyday situations, or social interactions that Indian children are not familiar with.

Furthermore, even though many technologies support evidence-based design, there aren't enough comprehensive, peer-reviewed research that show it works. With most effective case studies being anecdotal or using tiny sample numbers, generalizability is a challenge. Lastly, the investigation reveals that rules to standardize the use of these tools in Indian schools are lacking. There are no national regulations governing the use of behavioural therapy technology, which raises questions about its efficacy and safety, particularly when it comes to public institutions.

X. RECOMMENDATIONS

Given the aforementioned conclusions, a multifaceted approach is necessary to guarantee the secure, inclusive, and successful application of TABT in the Indian setting:

1. Creation of Indigenous Tools: Tools that are suitable for Indian students' culture and language are desperately needed. Public-private collaborations and government incentives could encourage innovation in this field. Mentorship and funding could be used to support startups in the ed-tech and health-tech sectors.
2. Teacher and Therapist Training: The effectiveness of any technology ultimately rests on how well it is used, regardless of how sophisticated it is. In order to include TABT

[28] Dovis S et al., *The Effects of Game-Based Cognitive Training on the Working Memory of Children with ADHD*, 22 J Atten Disord 337, 339–343 (2018), https://doi.org/10.1177/1087054712465064.

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techniques into therapy plans and classroom routines, structured training modules for special educators, therapists, and school administrators should be created. Technical instruction as well as sensitivity training are included in this.

3. Infrastructure Support in Government Schools: Funds should be set aside expressly for the implementation of assistive educational technologies through initiatives like Samagra Shiksha and Digital India. Depending on the results, pilot initiatives can be launched in a few areas before being gradually implemented nationwide.
4. Regulatory Framework and Standards: After consulting with the Ministry of Electronics and IT and the Ministry of Health and Family Welfare, the Ministry of Education should release a clear set of rules. Tool validation, data privacy, accessibility requirements, and ethical use should all be governed by these rules.
5. Evidence-Based Practice: To evaluate the long-term effects of TABT tools on behavioural, academic, and social outcomes in students with disabilities, more cross-sectional and longitudinal studies ought to be commissioned. Such study can be supported by cooperation between government agencies, medical facilities, and universities.
6. Parental Involvement: Parents need to be included in the intervention loop because a lot of TABT tools are app-based and may be used at home. Frequent orientation sessions, use data access, and feedback systems can enable parents to support therapeutic objectives outside of the classroom.

The establishment of internal ethical committees to examine the selection and use of TABT tools, particularly those that gather biometric or psychological data, should be promoted for educational institutions and therapy facilities that use cutting-edge technologies.

XI. Conclusion

TABT is a modern technology that has the potential to revolutionize the way we support and educate students with disabilities. It is not a futuristic concept. A major advancement in special education has been made with the shift from static, routine-based therapy techniques to immersive, adaptive, and data-driven solutions. It is clear from this research that TABT is in line with the experiential learning tenets. It provides a responsive, adaptable, and inclusive approach to behavioural development, especially for kids with learning disabilities, autism, ADHD, and sensory impairments. Thoughtfully used, technology not only fills in current therapeutic gaps but also creates completely new opportunities for social integration, emotional

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expression, and self-regulated learning. India must, however, make investments in domestic innovation, policy creation, and professional training if it is to realize this potential to the fullest. The use of technology may continue to be restricted to affluent private institutions or urban areas in the absence of these structural supports, failing to effect significant change at the local level. Inclusion must continue to be at the core of innovative educational practices as we advance into a world that is becoming more and more digital. In addition to receiving high-quality instruction, students with disabilities should also have access to the resources and technology that enable them to fully engage in the educational process. Technology has the potential to be a potent enabler of this vision if it is developed and applied with compassion and consideration.

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 [ISSN 2581-5369]