



Blended Learning Approach with ADHD on Students

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Abstract: This article explores the blended learning approach and its impact on students with Attention Deficit Hyperactivity Disorder (ADHD). By integrating traditional classroom methods with online learning components, this model aims to provide a flexible and engaging educational experience tailored to the unique needs of students with ADHD. The article highlights the benefits of blended learning, including personalized instruction, increased engagement, improved social skills, and enhanced critical thinking. Strategies for effective implementation are discussed, alongside potential challenges. The findings suggest that blended learning can significantly support the academic and social development of students with ADHD, ultimately fostering their success in educational settings.

Keywords: Blended Learning, ADHD, Educational Strategies, Student Engagement, Critical Thinking

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INTRODUCTION

Attention Deficit Hyperactivity Disorder (ADHD) affects millions of students worldwide, impacting their ability to focus, engage, and succeed in traditional educational settings. As educators seek effective strategies to support these students, blended learning has emerged as a promising approach. This educational model combines face-to-face instruction with online learning, offering flexibility and tailored experiences that can significantly benefit students with ADHD.

UNDERSTANDING ADHD IN THE CLASSROOM

ADHD is characterized by symptoms of inattention, hyperactivity, and impulsivity, which can lead to challenges in traditional classroom environments. Students with ADHD may struggle with maintaining focus, following instructions, and completing assignments, resulting in lower academic performance and social difficulties. Recognizing these challenges, educators are exploring innovative teaching methods to create more inclusive and supportive learning environments.

Blended learning integrates traditional classroom methods with online educational resources, allowing for a more personalized learning experience. This approach often includes a mix of in-person instruction, online lectures, interactive activities, and assessments. The flexibility inherent in blended learning can accommodate diverse learning styles and paces, making it particularly beneficial for students with ADHD.

1. **Personalized Learning Experience:** Blended learning allows students to progress at their own pace. Students with ADHD can take their time to understand complex concepts through online resources before engaging in classroom discussions.

2. **Increased Engagement:** The interactive elements of online learning, such as multimedia presentations, gamified assessments, and virtual collaboration tools, can capture the attention of students with ADHD, keeping them engaged and motivated.
3. **Flexible Learning Environment:** Students with ADHD often thrive in environments that reduce distractions. Blended learning can provide a quieter online space for learning, enabling them to concentrate better on tasks.
4. **Improved Social Skills:** While in-person interaction is essential, blended learning can facilitate social skills development through collaborative online projects. These platforms encourage communication and teamwork, helping students practice social interactions in a controlled environment.
5. **Enhanced Critical Thinking:** Online resources often promote critical thinking through problem-solving tasks and discussions. Engaging in these activities can help students with ADHD develop their analytical skills, which are crucial for academic success.

IMPLEMENTATION STRATEGIES

To effectively implement a blended learning approach for students with ADHD, educators should consider the following strategies:

- **Structured Online Content:** Ensure that online materials are well-organized and easy to navigate. Clear instructions and expectations can help students stay focused and on track.
- **Incorporate Variety:** Use a mix of multimedia formats, such as videos, interactive quizzes, and discussion boards, to maintain student interest and cater to different learning styles.
- **Frequent Feedback:** Provide regular feedback on students' progress. Timely responses can reinforce learning and help students with ADHD stay motivated.
- **Set Clear Goals:** Establish specific, achievable goals for online and in-class activities. This clarity can help students focus their efforts and measure their success.
- **Foster a Supportive Community:** Create a classroom culture that encourages collaboration and peer support. Building strong relationships among students can enhance social skills and reduce feelings of isolation.

CHALLENGES AND CONSIDERATIONS

While blended learning offers numerous benefits, it is not without challenges. Some students may struggle with self-regulation in an online environment, leading to procrastination or incomplete assignments. Additionally, access to technology and reliable internet can be a barrier for some students. Educators must remain vigilant and provide the necessary support and resources to address these challenges.

ADHD

ADHD is a developmental neurobehavioral disorder that is persistent, inherited, and may manifest in

infancy, childhood, or maturity. According to study, between one-third and half of children with ADHD have symptoms that persist into adulthood, according to the American Academy of Paediatrics (2007). ADHD is one of the 18 disorders included by the DSM IV-TR's common Axis-I. ADHD symptoms are referred to as hyperkinetic syndrome disorder in ICD-10. Both the DSM IV-(TR) and the ICD-10 believe that the typical symptoms of ADHD, which include difficulties focussing and paying attention, issues controlling behaviour, and hyperactivity or overactivity, start in early infancy. The following behaviours make it simple to diagnose a child with ADHD:

- Disorganization.
- Distractibility.
- Hyperactivity.
- Impaired response & excessive restlessness.
- Impulsive behaviour.
- Inattention.
- Mood swings.
- Poor coordination.
- Social clumsiness.
- Specific learning disabilities such as dyslexia, language problems, difficulties with handwriting /written work (Fuster, 1997).

In environments other than classrooms, children with ADHD act in a manner that is significantly different from ordinary childhood behaviour. They are social and enthusiastic. ADHD symptoms include poor self-esteem, irrational anger, peer rejection, limited tolerance for frustration, and violent outbursts. As a consequence, children's life may suffer at home, at school, in relationships, at work, and in the community. There are reports of ADHD from all across the world; however, statistical variations may arise from various cultural interpretations of behaviour. The Netherlands has the lowest prevalence of ADHD, at 2%, while India has the highest rate, at 30%. Up to 10% of Americans suffer from the disorder. There is an ADHD prevalence in every country, ethnic group, and socioeconomic class. The prevalence figures below are the outcome of research carried out across many nations: Brazil is at 5-6%, Canada is at 5-14%, China is at 6-9%, Germany is at 4%, India is at 5-29%, Japan is at 7-8%, New Zealand is at 2-7%, and the UK is at 3-5%. A 2005 survey indicated that 5.1% of children and 8.9% of teens in the US had ADHD. Research indicates that 2% to 4% of adults may also be affected, and 5% of children between the ages of 9 and 17 are affected at any one time.

Approximately one in 25–25% of children and young people have ADHD. Conservative estimates place the prevalence of ADHD in school-age individuals at 3% and 5%. Furthermore There are around three times as many affected males as girls. There were five males for every female among youngsters with

ADHD. Several studies carried both in the West and India have shown that men are more prone than women to have the illness. Stephen et al. (2003) concluded that ADHD is a behavioural problem affecting one to twenty children in the United States and other countries after examining all 50 MEDLIN research on the subject. Additionally, they agreed that ADHD is not exclusive to the United States and that its incidence in many other nations is equivalent to that of the US. The present statistics in India, which are based on patients from clinics or hospitals with skewed referrals or screening questionnaires, vary greatly from 1 to 20%. India is home to the largest number of children in the world, 190 million, between the ages of 6 and 14, according to statistics from the Economic Survey of India (2004). According to Siddique et al. (2010), children in Delhi who were between the ages of 12 and 14 had the highest incidence of ADHD (14.2%).

BLENDED LEARNING

- Like many other breakthroughs in educational practices, blended learning has multiple meanings and uses. Blended learning refers to the integration of various learning resources with both in-person and online instruction. The innovative and technological innovations of online learning are combined with the interaction and engagement of traditional classroom teaching to create blended learning, a flexible approach to education. Thorn (2003) claims that blended learning solves the issue of tailoring learning and development to each person's needs by fusing the best elements of traditional education with state-of-the-art technological breakthroughs. Blended learning is defined as combining online content delivery with the best aspects of live instruction and classroom interaction to personalise learning, allow for thoughtful reflection, and differentiate instruction from student to student across a diverse group of learners. The North American Council for Online Learning [NACOL], an international association for K–12 online learning, has supplied this description. Carter (quoted in Battye & Carter, 2009) defines blended learning as a deliberate and purposeful approach to teaching and learning that skilfully blends different pedagogies and modalities such that virtual and in-person learning complement one other.
- Beyond the combination of online and in-person training, the exact definition of blended learning may not be important in the end. Kim (2007) separated education into three primary groups: formal vs informal, scheduled versus self-paced, and in-person versus online classes. There are several possible combinations that may be created with these three dimensions. He defines blended learning as mixing two or more of the several accessible learning modalities. To this concept, he has added an important qualification. Online learning is required for one of the learning modes, while in-person, classroom-based learning is required for the other. This is to guarantee that traditional and online teaching approaches are still used in blended learning. While blended learning reflects a more deliberate and conscious approach to designing optimal instruction or learning environments following the strategy of blending components, the blended nature of traditional instructional contexts is primarily the result of habit (tradition), convenience, or happenstance. It's a common misconception that blended learning consists only of integrating online elements to traditional classroom training. But the most common result of this is the "course-and-a-half," a dysfunctional phenomenon (Educause, 2010). Schools may be particularly susceptible to this trap if the extra online components are solely focused on the newest technology, since this might provide the impression of true innovation that is deceptive.

ATTENTION DEFICIT HYPERACTIVE DISORDER (ADHD)

The neurodevelopmental illness known as Attention Deficit Hyperactivity illness (ADHD) is characterised by a child's inability to focus on a specific task and their impetuous and hyperactive behaviour. In order to understand the nature of ADHD, let's take a look at its history and onset.

History and Onset of Attention Deficit Hyperactive Disorder (ADHD)

Der Philosophische Arzt was published in 1775 by the renowned German physician Melchior Adam Weikard. Identical-looking behaviours were described in Weikard's book. Many see this work as the pioneering account of attention deficit hyperactivity disorder (ADHD) in the medical literature (Barkley, 2006).

The first person to describe Attention Deficit Hyperactivity Disorder (ADHD) was Dr. Heinrich Hoffman in 1845. His works on psychiatry and medicine detailed the signs of attention deficit hyperactivity disorder. He discovered that his three-year-old kid does not have access to any age-appropriate reading material. In an effort to provide his kid with age-appropriate reading material, he set out to compose a collection of poetry accompanied by images that explored the unique qualities of children.

The founder of British paediatrics, Sir George Fredric Still, released a collection of lectures given at England's Royal College of Physicians in 1902. In his lectures, he made the case that impulsivity and serious behavioural issues in children are the result of a hereditary disorder rather than bad parenting. These symptoms are now diagnostic of Attention Deficit Hyperactivity Disorder (ADHD) in youngsters. A large number of medical professionals have noticed that the kids are struggling with self-regulation and attention. Children exhibit aggressive and violent behaviour in relation to it (CDC, 2010).

Individuals in the medical profession started keeping records around 1902. Their symptoms of impulsivity, hyperactivity, and inattention are evident throughout the documentation process. The illness has been referred to as "attention-deficit disorder with or without hyperactivity" and "dysfunctional hyperkinetic childhood reaction learning behavioural disabilities" since then.

While a person's hyperactive conduct isn't always a cause for concern, Smith (2012) claims that it is often related with them. Attention Deficit/Hyperactivity Disorder is called "Hyperkinetic Reaction of Childhood" in the DSM-II (1968). The idea of Attention-Deficit Disorder (ADD) with or without hyperactivity was first presented in the Diagnostic and Statistical Manual of Mental Disorders III (1980). In addition, Attention-Deficit Hyperactivity Disorder (ADHD) was the refined and revised term in 1987. For example, DSM III R followed the same nomenclature as DSM III.

Published in 1994, the Diagnostic and Statistical Manual of Mental Disorders (DSM) IV TR primarily serves to correct factual mistakes and include revisions that will be reflected in subsequent editions. The Attention Deficit Hyperactivity Disorder (ADHD) component remained mostly unmodified in DSM IV TR. Version 5 of the handbook is the most recent one. Subtypes of Attention Deficit/Hyperactivity Disorder (ADHD) from DSM IV TR are updated in DSM V based on how the disorder manifests in the patient. The hyperactivity section is absent from the handbook, despite the fact that one-third of ADHD patients have inattentive symptoms, suggesting that they do not exhibit excessive behaviour (Moon, 2004).

Concept of Attention Deficit Hyperactive Disorder (ADHD)

A normal attention span of a child is measured at a ratio of 3 to 5 times the age (For example, if a child is 4 years old, then the child is able to concentrate on a certain task for at least 12 minutes). If the attention span of a child is much shorter than this, it may be a result of an attention disorder. Due to this disorder, children are facing difficulty in sustaining attention to a particular object for a prolonged time, unable to sit in a place when it is necessary etc. Such type of disorder is categorized as Attention Deficit Hyperactive Disorder (ADHD). In this disorder, an individual has either problem in attention, hyperactive or impulsiveness or both.

According to Diagnostic and Statistical Manual of Mental Disorders (2004), Attention Deficit Hyperactive Disorder (ADHD) is a condition or brain disorder in which a child or adolescent who are facing significant difficulties with inattention, impulsivity and overactive behaviors and interferes with functioning or development. Attention Deficit Hyperactive Disorder (ADHD) is a developmental disorder that starts from early childhood and frequently persists into adulthood.

Attention Deficit Hyperactive Syndrome is defined as a consistently high level of activity that is manifested in situations when it is clearly in appropriate and is coupled with an inability to inhibit activity or command (Helms & Jeffrey, 1981; Carson, 1988; Dworetzky, 1977; Kaplan, 1998; Gilovinch, 1990; Fauman, 1996).

In the view of Davidson et al., 1978; Scully, 1989, Attention Deficit Hyperactive Syndrome is defined subjectively as an increase in motor activity to a level interferes with the child's functioning either at school or at home.

According to DSM V, Attention Deficit Hyperactive Disorder (ADHD) is a neuro developmental disorder affecting both children and adults. Individuals with ADHD may also have difficulties with maintaining attention, executive function (or the brain's ability to begin an activity, organize itself and manage tasks) and working memory.

In the previous edition, DSM-IV TR, the three types of ADHD were referred to as “subtypes”. Attention Deficit Hyperactive Disorder (ADHD) can be classified into three subtypes according to DSM IV. They are listed below as

Predominantly Inattentive subtype

Predominantly Hyperactive- Impulsive subtype

Combined Inattentive and Hyperactive-Impulsive subtype

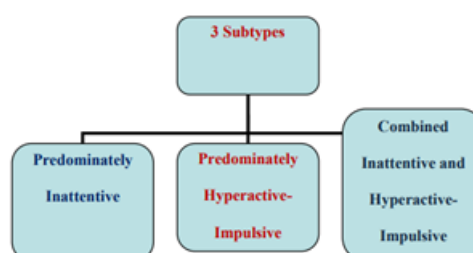


Figure 1: According to DSM_IV Attention Deficit Hyperactive Disorder (ADHD) Subtypes

This is different in DSM V; "presentations" are the new name for subtypes. People might have different "presentations" throughout their lives due to the fact that symptoms can vary over time. How the condition manifests itself in a person's life at various stages is best captured by this shift. Disorders of Attention Deficit Hyperactivity (ADHD) may be categorised into three types in DSM V:

- Inattentive presentation
- Hyperactive- Impulsive presentation
- Combined Inattentive and Hyperactive-Impulsive presentation



Figure 2: According to DSM_V Attention Deficit Hyperactive Disorder (ADHD) Presentations

CAUSES FOR ATTENTION DEFICIT HYPERACTIVE DISORDER (ADHD)

Disease of Attention Deficit/Hyperactivity Problems with focus, attention, self-control, and self-esteem are symptoms of Attention Deficit Hyperactivity illness (ADHD), a brain illness affecting children and teenagers. Students with Attention Deficit Hyperactivity Disorder (ADHD) may find it more difficult to focus and complete assignments, even if the disorder itself is not a learning handicap (Samuels, 2005).

Attention Deficit Hyperactivity Disorder (ADHD) is mostly inherited, meaning it is the result of several genes interacting with one other. According to Smitha Bandari (2015), the likelihood of a kid getting diagnosed with Attention Deficit Hyperactivity Disorder (ADHD) is above 50% when there is a parent with ADHD in the family.

Attention Deficit Hyperactivity Disorder (ADHD) may have several causes, including environmental conditions, accidents sustained during or after pregnancy, and genetics. Variability in the manifestation of problems is inherent in any diagnosis of Attention Deficit Hyperactivity Disorder (ADHD) in an identical twin (Schwartz, 2008).

Children diagnosed with Attention Deficit Hyperactivity Disorder (ADHD) often have low levels of

dopamine, a neurotransmitter in the brain. Neurotransmitters are a class of molecules that regulate many brain functions and are encoded by genes. The imbalance of neurotransmitters is a result of the indifference chemical level in Attention Deficit Hyperactivity Disorder (ADHD). Imaging studies using magnetic resonance imaging (MRI) have shown that there are dysfunctions in the regions of the brain responsible for controlling and monitoring certain motor skills and executive functions. People who suffer from Attention Deficit Hyperactivity Disorder (ADHD) may have reduced activity in certain regions of the brain (Neel Duggai, 2016).

CHARACTERISTICS OF CHILDREN WITH ATTENTION DEFICIT HYPERACTIVE DISORDER (ADHD)

Among the many traits shared by kids with an ADHD diagnosis are behaviours that fall into the following three broad categories: hyperactivity, impulsivity, and distractibility (Barkley, 1998).

Issues with focus and attention span, impatience, and procrastination are hallmarks of the inattentive subtype of ADD/ADHD. Excessive motor movements, impulsive decisions, and behaviour are hallmarks of the Hyperactive-Impulsive subtype of Attention Deficit Hyperactivity Disorder (ADHD).

Disruptive, rebellious, and unable to focus behaviours are common among people with this disease. They may also have difficulties interacting with others, including parents, classmates, and instructors. Problems paying attention, disobeying directions, being bored with seemingly unrelated activities, losing track of time, and disorganisation are all symptoms of Attention Deficit Hyperactivity Disorder (ADHD) in children. Symptoms of a hyperactive or impulsive child may include restlessness, difficulty sitting still for extended periods of time, disruptive behaviour, excessive talking, and so on. Defiant, too demanding, less able to play, and having trouble working independently are symptoms of Attention Deficit Hyperactivity Disorder (ADHD) in children.

Separating the behaviours of children with Attention Deficit Hyperactivity Disorder (ADHD) from those of typically developing youngsters may be challenging. We often fail to identify the kid with Attention Deficit Hyperactivity Disorder (ADHD) since both youngsters display the same behaviours. Differentiating ADHD from typically developing youngsters requires detection and evaluation of Attention Deficit Hyperactivity Disorder (ADHD).

EDUCATIONAL INTERVENTION FOR STUDENTS WITH ATTENTION DEFICIT HYPERACTIVE DISORDER

Interventions in the classroom for children with Attention Deficit Hyperactivity Disorder are just as important as medical treatments. The methods of teaching must encourage focus and assist in the mitigation of negative behaviours. Students with Attention Deficit Hyperactivity Disorder (ADHD) may benefit from a variety of educational approaches. Under the headings below, it is explained.

EDUCATIONAL RIGHTS FOR CHILDREN WITH ATTENTION DEFICIT DISORDER (ADD) / ATTENTION DEFICIT HYPERACTIVE DISORDER (ADHD)

Part B of the Individuals with Disabilities Education Act (IDEA) may provide specific assistance to children who have Attention Deficit Hyperactive Disorder (ADHD) or Attention Deficit Disorder (ADD). A kid would be eligible for the specialised treatments if it is found that their ADHD or ADD is a chronic or acute health concern that negatively impacts their academic performance. Each qualified child with disabilities receives a Free Appropriate Public Education (FAPE) via an Individualised Education Program (IEP), also known as an Individualised Education Plan.

A youngster must fall into one of thirteen distinct handicap categories in order to be eligible for IDEA. Frequently, the Other Health Impairment (OHI) category will be appropriate for children who have Attention Deficit Hyperactivity Disorder (ADHD). Another possible diagnosis might be severe emotional disturbance or specific learning disability.

Dropout rates, the frequency of failing grades, and academic results are all much worse for students with Attention Deficit Hyperactivity Disorder (ADHD) as compared to those without the disorder (Fischer et al., 1993). Educational intervention refers to any kind of assistance provided to a student in order to facilitate their learning, comprehension, information acquisition, etc. Students with Attention Deficit Hyperactivity Disorder (ADHD) often benefit from educational interventions designed to help them focus and succeed in the classroom.

Behaviourally orientated school therapies are among the most successful (Wilson et al., 2001), and school-based intervention programs for ADHD and other disruptive behaviours are beneficial in lowering symptoms (Catalano et.al, 1998).

A student's social and academic performance in school is strongly correlated with their ability to listen, pay attention, follow instructions, and demonstrate social competence (Cartledge & Milburn, 1978; Eisenberg et al., 1997; Masten & Coat worth, 1998). Students who suffer from Attention Deficit Hyperactivity Disorder (ADHD) often find it challenging to focus for extended periods of time and are prone to becoming sidetracked. As a result, they struggle with several academic responsibilities, including completing assignments and interacting correctly with both instructors and classmates. Students with Attention Deficit Hyperactivity Disorder (ADHD) may experience a decline in self-esteem due to a lack of accomplishments and recurrent conflicts.

NEED FOR ANIMATED LEARNING PACKAGE OF MATHEMATICAL CONCEPTS FOR CHILDREN WITH ATTENTION DEFICIT HYPERACTIVE DISORDER (ADHD)

Toys, computer programs, videogames, or programmable bricks are examples of external artefacts that are known to stimulate children's creativity and learning. Interactions with individuals and the environment around are crucial for effective learning. When children watch animated films (like Dora the Explorer or The Adventurer), it allows them to engage with the characters and stories.

Children can retain more information in school and have more fun doing it if engaging instructional and amusing animations are created. We all know that every student has unique requirements, therefore it's reasonable to assume that teachers will need to adapt their methods of instruction accordingly. It is the

responsibility of any teacher, but notably maths instructors, to help each student learn more by paying close attention in class. Many mathematics educators in inclusive settings still rely on time-honoured practices when instructing their students. Samacheer Kalvi Thittam, the Common School Curriculum, is followed by both public and private schools in Tamilnadu.

Mathematical instruction is being adapted to accommodate students with and without impairments via the use of engaging instructional tools. Mathematical topics may be better understood by students when they have the opportunity to learn by doing in a mathematics laboratory. Mathematical topics may be better understood by students if they use a variety of technology teaching techniques and equipment in the maths lab.

As a result of technological advancements, math educators are preparing for the future by using smart boards to display course materials. However, mathematics instructors in many schools lack sufficient knowledge about mathematics labs, smart boards, etc.

A lot of kids, disabled and not, are having trouble with maths. Students are struggling with a variety of mathematical tasks, including conceptualisation, memorisation, and application of mathematical techniques. Students with Attention Deficit Hyperactivity Disorder (ADHD) need an alternative method of studying mathematics due to the subject's heavy reliance on formulas, explanations, and related issues. Due to cl instruction, student management issues, etc., many maths instructors struggle to provide concise explanations of the material. For pupils to fully grasp mathematical concepts, it is essential that teachers provide detailed explanations of equations and topics. If students aren't paying attention while the instructor is explaining a formula or piece of knowledge, the teacher will have to work harder to ensure that the pupils comprehend.

Establishing routines and routinely applying rules in the classroom may help create an encouraging atmosphere for students to study. Students with Attention Deficit Hyperactivity Disorder (ADHD) need a peaceful, organised, supportive classroom setting in order to focus and avoid anxiety (Charles, 2005). Anxiety disorders have been shown to coexist with ADD in as much as 25% of students (American Academy of Paediatrics, 2006).

Students with Attention Deficit Hyperactivity Disorder (ADHD) may benefit from an animated approach to mathematics instruction, according to the available materials. Research on an Animated Learning Package of Mathematical Concepts for Students with Attention Deficit Hyperactivity Disorder (ADHD) is urgently needed and will bring this topic into the spotlight.

CONCLUSION

The blended learning approach holds significant promise for supporting students with ADHD. By combining the best of both in-person and online education, this model can create a more engaging, flexible, and inclusive learning environment. As educators continue to explore and implement blended learning strategies, they can foster the academic success and social development of students with ADHD, equipping them with the skills they need for a bright future.

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