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Private Studio and Classroom Instructional Strategies

for Students with ADHD

Abstract

There is significant statistical evidence that music teachers will be presented with the opportunity to instruct students with Attention-Deficit/Hyperactivity Disorder (ADHD) at some point in their career. This investigation examines specific deficits commonly observed in these students and provides current theories relevant to the educator's teaching strategies within the private studio and classroom settings. It also includes scientific research on learning techniques that promote positive brain development. These elements will aid the instructor in creating a musical environment in which the student with ADHD may cognitively thrive and resolve on a continued investment in the music learning process.

Introduction

A survey of American parents in the years 2016–2019 reported that approximately one out of 10 children ages 3–17 had been diagnosed with ADHD (Centers for Disease Control and Prevention 2023). This disorder is evaluated under three presentations: "inattentive," "hyperactive-impulsive" and "combined" (Verywell Health 2023). The symptoms of this disorder can cause significant impairment in learning settings, such as in one's ability to retain information, follow directions and exhibit self-control. As the statistics show a high likelihood of music instructors coming across these unique learners, it is sensible for teachers to undergo preparatory training regarding their education (de l'Etoile 2005, 37). Instead of utilizing methods that are practical for neurotypical students, teachers should adapt their techniques to serve the needs of students with disabilities (Swanson 2007, 218).

The focus of this research is to explore current theories that may be employed when addressing the deficits commonly observed in students with ADHD. Furthermore, it makes application of these theories through offering teaching strategies suitable for the private studio and classroom. These methods include maintaining adequate stimulus of the student's brain to encourage the absorption of information, developing positive behaviors utilizing cognitive behavioral therapy and addressing sensory distractions. Involving parents in their child's lessons and keeping open communication with parents and students are two critical elements of educational success. Finally, the pedagogical techniques offered are supported with scientific research on learning techniques that promote positive brain development. Not every individual with ADHD will require the same educational adjustments, but with patience and willingness to explore various options, the teacher may work toward educational goals effectively.

Background

ADHD has historically been identified by other diagnoses: It was initially labeled as hyperkinetic reaction of childhood in 1968; this description was later updated to "ADD" in 1980. While ADHD took the place of "ADD without hyperactivity" in 1987, some individuals continue to use ADD for the inattentive presentation of ADHD (Verywell Health 2023).

ADHD is currently diagnosed based on three presentations: inattentive, hyperactive/impulsive and combined presentations (Moore 2009, 57). The inattentive presentation results in challenges related to executive function. The hyperactive/impulsive presentation is characterized by difficulties related to self-control. Those who are diagnosed with the combined presentation have exhibited a threshold of six symptoms from both types if under 16 years of age and five if over 17 (Sparrow and Erhardt 2014, 56–57). A diagnosis of ADHD requires that symptoms were initially noted before the individual reaches age 12, per the DSM-5 [*Diagnostic and Statistical Manual of Mental Disorders*, Fifth Edition] (Sparrow and Erhardt 2014, 59).

ADHD impacts many students in educational settings. For neurotypical students, learning stimulates positive brain neuroplasticity. By contrast, students with learning challenges do not experience the same process as effectively. Students with ADHD may specifically note difficulty in retaining and recalling long-term memory data. The nature of this memory impairment may inhibit the application of standard learning techniques, including "grouping similar items, recognizing symbols, following sequences, and linking sounds with visual images" (de l'Etoile 2005, 38). Not all symptoms of ADHD may be negative, as there also may be areas where it creates learning benefits. Some students with ADHD are gifted with the ability to hyper-focus and are naturally skilled in memorization through muscle memory. Others may possess multitasking abilities and the capacity to master pieces quickly when experiencing the "pressure of a deadline" (Raviotta and Raviotta 2018, 42).

Various common musical learning deficiencies have been observed in students with ADHD. One of these difficulties includes the inability to sense pulse; connected to this are problems in correctly executing rhythm. Students may also lack body awareness, resulting in issues with improper posture and poor control of motor coordination. Lastly, students with ADHD may experience challenges in establishing positive practice routines, or with organization (Raviotta and Raviotta 2018, 42). These factors will inhibit the development of the student without intentional remediation.

Because of the obstacles endured in educational environments, there are several possible emotional tendencies of children with learning disabilities. These include feeling crushed by missed goals and the tendency to become readily disheartened. Further, they may display a lack of patience for difficulties and make sickness an excuse for not completing work (de l'Etoile 2005, 38).

Consideration of Optimal Stimulation Theory in Maximizing Learning Impact

Sydney S. Zentall was the first to explain the presence of hyperactivity in children with ADHD through the lens of what she termed "optimal stimulation" theory. She stated that children with ADHD exhibit "active and distractible behavior" in low stimulus environments, such as completing school assignments (Greenop and Kann 2007, 332–333). Other times these behaviors may be present are during activities that are "repetitive, slow-paced, and too familiar" (de l'Etoile 2005, 40). Zentall suggested that activities that increase stimulation assist students in completing assignments (Greenop and Kann 2007, 333). In considering this theory, Lesley McAllister, NCTM, proposes that structuring lessons around an assortment of activities fulfills the need for adequate stimulation. She specifically mentions the incorporation of computer software for sensory stimulation as it often promotes student focus (McAllister 2012, 20). Her idea regarding technology corresponds to a 2018 study from North Iran that suggests the use of a pedagogical agent assists math learners. This component increased attention toward desired educational principles by employing "social cues" from a realistic cartoon character. It was demonstrated that students with ADHD who utilized this method

of learning showed greater understanding and engagement (Mohammadhasani 2018, 2304–2305). While this limited research was conducted in reference to math, it could potentially be adapted for a variety of musical topics including rhythm, theory, history and ear training as well as form and analysis. Further study in relation to music education would be beneficial, as it could be incorporated into music studio lab activities.

Shannon de l'Etoile (2005, 40) also emphasizes that the sensory aspects of a lesson help children with ADHD recognize areas of significance, while providing a higher level of stimulation necessary for learning. This may be accomplished through various means. For instance, the instructor may use colored or bold font to point the student toward important details. Additionally, aural indications may assist in signaling new activities, such as performing a particular note pattern or instrument. Lastly, student focus may be boosted by altering the order of the lesson or through reinterpreting the rhythms or tonality of the accompaniment (Swanson 2007, 220).

Utilization of Multisensory Teaching Methods

The implementation of "multisensory and multimodal" lesson experiences has been observed to be an effective means of increasing stimulation and improving student performance (Raviotta and Raviotta 2018, 43). Furthermore, a study out of the University of Münster demonstrated that multisensory learning experiences in music improve neuroplasticity. Additional research would illuminate the most effective combination of the senses during instruction. While it is noteworthy that extended multisensory musical training furnished more benefit to neuroplasticity, "short-term training" also provided an advantage (Paraskevopoulos et al. 2014, 2224, 2236).

In considering multisensory methodology, instructors should apply techniques that incorporate "visual, auditory, read-write, and kinesthetic" forms of learning (Raviotta and Raviotta 2018, 43). This may take various forms in the private music studio and classroom. For instance, the teacher may explain a rhythmic idea while notating it on a musical white board, or the student may be encouraged to clap a rhythm while reciting the counts out loud. Tablet or phone apps provide strong multisensory opportunities for reinforcing musical skills in note reading, music theory and aural skills (Raviotta and Raviotta 2018, 43). Sample apps that develop these areas include *Tenuto*, *Rhythm Trainer* and *Earpeggio*.

Cognitive Behavioral Modification as a Means of Developing Positive Behaviors

Researchers have sought to discover effective psychotherapeutic avenues for addressing the counterproductive behaviors connected with ADHD. Cognitive behavioral modification (CBM) is an evidenced-based method for promoting positive behavioral development in children with this disorder (Susan E. Sprich et al. 2016, 1218). CBM is the result of a combination of learning theories that include operant learning/behavior modification, social learning theory and cognitive theory/cognitive training. Techniques from each of these theories may be considered for application within the private studio setting. For example, the implementation of "consistent consequences to shape behaviors" is categorized under operant learning (de l'Etoile 2005, 38). To apply this, private instructors must clearly notify students regarding consequences for neglecting teacher standards, a purpose for which distributing studio policies is especially conducive. It should be emphasized that such policies are only beneficial if dependably followed by both parties, as consistency is key to making a positive impact on student behavior. Intermittent consequences for missing expectations promote the continuation of poor habits, which is detrimental to the student. When a student struggles to follow through, the teacher may motivate them through a behavioral contract attached to consequences decided by the student and their parents (Swanson 2007, 219–220).

Not all operant learning methods are intended to curb negative behaviors. Teachers may also apply techniques that provide positive behavioral reinforcement. One important goal is to teach students to be engaged in their education while providing rewards if reinforcement is necessary (de l'Etoile 2005,

38). Part of this process should include fostering self-awareness. One effective means for promoting this is through regular feedback from the instructor on the quality of student work and behavior during lessons. Providing frequent coaching inspires the student to improve. The instructor may also establish a rubric indicating the method of assessment utilized in measuring student progress during the lesson (Swanson 2007, 219–220). Moreover, Kathleen Melago (2014, 40) states that students may develop the skill of personal evaluation through observing their own performance videos. I have found using a mirror while practicing helpful for this purpose as well.

An additional way to inspire positive development is through establishing a "token economy," where tokens that function as payment toward an award or "privilege" are provided for positive behavioral choices (de l'Etoile 2005, 41). Within this system, the student may be offered a list of choices as to what the tokens may purchase. The goal of this approach is for the student to perform correct behaviors habitually. The use of a token economy is related to methods that promote personal assessment. This awareness may be further encouraged through having students complete self-evaluation forms regarding conduct. The student and teacher collaborate to develop the forms and decide on the areas of focus for behavioral development, limiting its scope to a maximum of five goals. For instance, areas of assessment for the piano student might include how well they remained seated at the required times throughout the lesson or whether they avoided talking out of turn. The student then commits to the completion of the behavior evaluation form at a predetermined time, such as at the end of the lesson. The achievement of positive behaviors is commended, as in the token economy. Another strategy for employing self-assessment forms requires both the student and teacher to evaluate, providing a reward when the observations of the student and teacher largely coincide. It is important to wean the student from reinforcement as behavioral goals become habits. This may be achieved through raising the standard for assessment, which also serves to promote greater perceptiveness (de l'Etoile 2005, 41–42).

Teaching Techniques Derived from CBM Learning Models

CBM learning models also provide insight regarding the presentation of learning material. Students with ADHD thrive when teachers provide thoroughly planned activities and procedures during lessons (de l'Etoile 2005, 40). It is particularly beneficial to schedule interspersed activities that involve movement. This is supported by a survey of music therapists from 2003 that states music and movement is the most often practiced method for treating ADHD children (Jackson 2003, 307). Teachers may integrate short segments of the lesson where students are allowed to get their wiggles out (de l'Etoile 2005, 40). A method of limiting the range of this activity involves encouraging students to concentrate their movement within an isolated area of the body. The teacher may also periodically have the student use a stress ball to burn energy, such as when discussing a music theory lesson, or in between pieces. One student with ADHD I work with prefers a pop bubble fidget toy ball for this purpose. Moreover, unless prevented by the instrument of study, children may be permitted to alternate between sitting and standing during their lesson (McAllister 2012, 21). These planned breaks encourage children to stay on task through increasing stimulation. The overall application of a well-managed schedule reduces areas of the lesson where student attention may be diverted from goals (de l'Etoile 2005, 40).

There are multiple avenues for incorporating social learning in the private studio setting. Student character may be refined through observing goal behaviors as demonstrated by their teachers. As an illustration, if one of the student's behavioral objectives is to maintain a positive disposition during the lesson, it is important the teacher maintains an encouraging attitude while teaching. Social learning is also practical for presenting material, particularly through elucidating its significance in a way that is understandable. A student is more likely to participate in suggested learning activities

when they perceive the logic behind the educational process (de l'Etoile 2005, 38). This is applicable to situations such as when a student is reticent to clap while counting a rhythm. An explanation of how this activity improves the visual processing of notes may encourage a student's efforts.

Instructors may provide cognitive training through promoting effective methods for knowledge mastery. This may be applied to areas including practice habits, music theory understanding, preparing to play and general tasks related to executive function. While all students need to be taught how to practice, this aspect of musical learning needs to be particularly emphasized to learners with ADHD. One necessary practice technique that requires coaching concerns the division of a piece into manageable areas of study (Swanson 2007, 219). This is an effective alternative to tackling an entire work at once and helps avoid the loss of accuracy that results from attempting to digest too much information simultaneously. Additionally, there are underlying concepts that must be memorized to engage in musical activities, such as note reading and procedures in setting up for a music lesson. Many teachers employ mnemonic devices for learning the notes on the staff, but this may also be applied to recalling the order of the steps taken in readying one's instrument, music and mind for learning (de l'Etoile 2005, 39).

Teachers also need to be actively involved in directing students to where their attention is most needed. This process develops the capability of systematizing "thought processes" and "learning materials." The student may be encouraged to maintain orderly lesson materials through the utilization of an organizer. The lesson itself may be well-structured through the creation of a planned schedule for the day that points the student to an agenda of goals. This also helps the teacher limit their focus to a predetermined selection of repertoire and technique development. One overarching principle to follow during the lesson is to prioritize the most challenging items before the student's focus has been exhausted (Gale Academic OneFile 2006, 8). Finally, student achievement is more likely when students with ADHD are offered short-term objectives (Swanson 2007, 219). I have found assigning brief pieces that expedite the development of musical techniques is particularly motivating to these students; it is less overwhelming and provides more immediate gratification for completing repertoire.

Shaping an Ideal Learning Environment for ADHD Learners

The teacher can maximize the effectiveness of their instruction by creating an ideal learning environment for ADHD learners. One significant way this may be achieved is through minimizing distracting elements in the teaching environment, thereby promoting focus. This includes the consideration of any background sounds such as clocks and phones, outdoor scenes outside windows and the decor in the room where lessons take place. If the instructor is teaching at a home studio, smells from sources such as food must also be considered as possible distractions (Melago 2014, 39). It is also important to maintain a positive teaching atmosphere that students enjoy experiencing. One way to do this is through showing interest in the student by inquiring about their wellbeing before the start of the lesson. Additionally, the teacher may involve the student in making choices, such as repertoire selection or dynamics within a piece. The student may also be encouraged by the teacher's willingness to coach them through frustrating material, as well as through verbal rewards for exertion that additionally promote the student's willingness to welcome input (McAllister 2012, 19). As supported by the aforementioned study from the University of Münster, the ideal learning environment for students with ADHD incorporates multisensory solutions to remediate musical deficiencies. This is exemplified by addressing the lack of a sense of pulse with tactile and visual solutions. Tactile remedies include having a parent tap the metronome pulse on the student's back, or having the student wear a vibrating metronome. As far as visual methods are concerned, a pendulum-style metronome that provides a visible pulse is helpful, as well as having the teacher conduct while a metronome is contemporaneously

heard. Alternately, rhythm challenges may be addressed through verbal and visual methods. Benjamin and Sara Raviotta (2018, 44) write of speaking preselected words that clarify rhythms within music. They also attach pictures to identify rhythms, such as the use of "cappuccino" to symbolize four sixteenth notes and "pineapple" to designate a triplet (Houghton Horns, n.d.). Integrating multisensory teaching philosophies into lessons that target both the sense of pulse and note reading may also be of assistance. Orff, or "Orff Schulwerk," is one method that engages in multisensory musical learning, as it combines "music, movement, speech, and drama" (America Orff-Schulwerk Association, n.d.). In this system, musical notation is learned within the context of already familiar musical knowledge. Students begin their musical experiences by learning rhythm in an improvisational context utilizing percussive instruments and recorders (Cary 2012, 188). An alternative method with a slightly different focus is Kodály. The emphasis in this method is the use of solfège within the movable do system to promote "musical literacy," with its various syllables demonstrated by designated hand shapes (Organization of American Kodály Educators, n.d.). The Kodály method also endorses folk music as a bridge to the classical genre.

Nurturing Accurate Note Reading and Processing with Multisensory Teaching Methods

There are a variety of multisensory teaching methods that may be used for cultivating note reading fluency and processing in students with ADHD. One may utilize technology by encouraging the student to experiment with musical notation in music engraving software and having them listen to their work to check for accuracy. To facilitate precise visual processing, repertoire may be reproduced on colored paper and blown up in size. An additional option to consider is placing "colored plastic overlays" over the student's sheet music (Raviotta and Raviotta 2018, 44). The latter method is generally observed to produce prompt enhancement in note reading for the students who find it beneficial. Each student will discern different colors to be useful, so experimentation with various options during the lesson may be necessary. Overlays are of even greater advantage when used simultaneously with other learning tools. The teacher may foster the student's observational skills by having them speak the letter of a specific note on a page or directing them to observe and mark repeated patterns in their music.

Maximizing the Absorption of New Material

The teaching of certain musical concepts may be enhanced or impeded by instructional methods. For instance, teachers may find that students are able to absorb new rhythms more readily when they are introduced separately from other unfamiliar concepts. This helps avoid overwhelming the student with new information. On the other hand, progress in reading music may be inhibited when the teacher sings the notes while the student performs. The instructor needs to consider that a student with ADHD may prefer to rely on imitation and memorization rather than push themselves toward note reading fluency (Raviotta and Raviotta 2018, 45).

Remediating Posture and Promoting Control of Motor Coordination

There are a variety of techniques an instructor may employ in improving student posture and control of motor coordination. As in the overall learning process, students with ADHD benefit from approaching these goals through implementing a series of smaller steps correctly. These movements must be repeated until they are internalized (Raviotta and Raviotta 2018, 45–46). An example of this in string pedagogy is the "Statue of Liberty" exercise, which develops the proper placement of the violin or viola on one's shoulder through a succession of movements (*The Strad* 2018). In developing good posture, it is important to use methods that assist students in making physical adjustments as they grow. For instance, the teacher may provide images of the student's current posture and goal pictures for comparison. This helps students perceive their posture within the context of their changing body shape. An additional method of increasing body awareness is the

use of Dalcroze eurhythmics to encourage the "coordination of gross motor movements" (Raviotta and Raviotta 2018, 46). This methodology was developed by Émile Jaques-Dalcroze for the purpose of teaching music through the means of art. Its goal is to cultivate sensitivity to elements of musical pieces "through bodily movement" (Bogdanowicz 2016, 134). Interestingly, a study by Ewa Bogdanowicz also suggests eurythmics may remediate behavioral challenges through its multisensory activities, but further investigation is required to adequately determine its efficacy (Bogdanowicz 2016, 143–144).

Elements Behind Educational Achievement in Music

One of the keys to educational success in music is the development of positive practice routines and organizational skills. Several factors contribute to this, one of the most important being the engagement of parents in the learning process during home practice. To encourage parental involvement in the musical studies of their children, Diane Briscoe points to the wealth of documentation available regarding the impact of this relationship on student progress. Several variables impacted the level of influence, such as the longevity of the assistance parents were inclined to provide, as well as their personal commitment to music appreciation (Briscoe 2016, 41–42). The instructor can support parents in this undertaking by requesting they attend their child's private lessons, whether temporarily or long-term. During the lesson, the teacher may offer suggestions on home practice so the parents may guide their child. Having parental accountability encourages the child to observe the instructions of the teacher, maximizing the effectiveness of practice sessions. A specific area where parents may assist is in the efficient management of practice time (Melago 2014, 39).

Tools for Home Practice

Various materials have been developed to promote fruitful home practice. James O. Froseth created the *Home Helper* series to help direct the musical role that parents have in supporting their child's musical endeavors. *Home Helper* was created to benefit beginner lessons on band instruments, providing both sound examples and pictures of proper technique to emulate. It also includes a checklist for the student to utilize in verifying the completion of assignments and allows space for the teacher and parents to communicate with one another (Froseth 2005). Unfortunately, there is no precisely corresponding resource for piano or orchestral instruments. One may piece together similar elements for the piano by utilizing a few alternate materials. A practice log called *Practicing Is for the Birds* by Susan Pascale assists teachers, students and parents in structuring home practice sessions. This may be combined with the *Piano Adventures* series, which offers online videos to demonstrate the material within the primer level (Piano Adventures, n.d.). A similar arrangement may be done for string orchestral instruments by employing *Practicing is for the Birds* along with a resource such as the *Measures of Success* series for string orchestra. *Measures of Success* provides picture examples of exercises (such as the aforementioned "Statue of Liberty") and offers online links to video demonstrations as well as MP3 accompaniments with and without the student's part (The FJH Music Company, n.d.). An American folk music alternative to *Measures of Success* is the *O'Connor Method*, which provides string instruction from the beginning of lessons with written descriptions of subjects such as placement of the instrument, proper bow tension and desirable tone, though it has limited exercises and picture demonstrations of holding the instrument; it also provides accompaniment tracks both with and without the soloist but does not offer instructional videos. One unique feature that sets it apart from other methods is its encouragement of imagination through improvisational exercises (O'Connor 2009). While there is a lesser emphasis on the multisensory learning of technique, the potential for unique creative output introduced by improvisation may be especially stimulating for students who crave variety. The repertoire chosen for this method connects with the Kodály idea of introducing art music through the folk genre, and in this way, bridges the gap between folk and

classical music appreciation for the parent and child. One should be cautious with the use of recordings from any instrumental method to ensure they are not utilized to learn songs by ear, impeding note reading.

Addressing Negative Behaviors Related to ADHD

Teachers need to manage negative behaviors of students with ADHD with discernment. Some of these behaviors are unintentional, such as talking out of turn during the private lesson, squirming in one's seat or making noises with objects (Swanson 2007, 219). When choosing how to handle these behaviors, it must be understood if the behavior is the method by which the student promotes mental stimulation. The instructor can make sure the student is absorbing the information presented during the lesson through asking evaluative questions or observing their ability to follow directions. Behaviors that enable learning may be ignored or directed into another educational activity. Concerning redirection, Carl Swanson provides the example of engaging a student who taps a pencil in holding an item that will assist in the music lesson. This could be something that the student may use to demonstrate rhythm, such as an egg shaker or cloth that is employed during music and movement exercises. In the end, the aim is to encourage the student's ability to focus, whether it is through the means they choose or an alternative method inspired by the teacher (Swanson 2007, 219).

Maintaining Communication with Parents of Students

Just as it is important for parents to be involved in their child's lessons, communication between the teachers and parents is paramount. When considering a student for their music studio, the teacher may decide to include questions regarding learning disabilities during the interview process. This signals to parents that such information is valuable in the private lesson setting, though parents may choose to avoid sharing information regarding ADHD (Melago 2014, 39). When this information has not been provided but is later suspected, the teacher must proceed sensitively. The private instructor may furnish an updated studio policy at the beginning of the school year with a request for current personal information, including an inquiry regarding accommodations needed for underlying conditions. Alternately, teachers may share observations and teaching methods attempted with parents, while refraining from diagnosing the student. When parents are willing to communicate regularly and openly, this provides the opportunity for teachers to gain insight regarding signals of frustration exhibited by the student or ideal methods for alleviating discouragement (Melago 2014, 40). The teacher may apply this understanding toward productive interactions with the student. When teachers are permitted the knowledge of a student's ADHD diagnosis, it allows them to make appropriate accommodations that encourage the student's focus in private lessons. For instance, the teacher may offer abbreviated lesson appointments for students with ADHD, perhaps even providing two shorter segments each week. For students who utilize medication to focus, it is important to make sure that the time slot the instructor offers does not surpass the length of their medication's effectiveness. As far as lesson structure, Melago suggests that some students flourish on consistent structure while others may become disinterested within this format (Melago 2014, 40). Regardless, it is crucial to keep the lesson moving to maintain the engagement of the student. The use of multisensory learning experiences ought to be maximized, while removing any potential sensory distractions. The beginning of the lesson is a suitable time for the instructor to encourage stretching and breathing, preparing the student for learning. Additionally, it is beneficial to summarize the topics addressed during the lesson as the session ends, incorporating questions that encourage student recall (Melago 2014, 41–42).

Maintaining the Proper Outlook

Providing musical education to students with ADHD requires both a positive and service-oriented mentality. In fostering this attitude, it is of primary importance not to meditate on frustrating teaching experiences, but rather remain cognizant of a student's favorable qualities. Personal positivity

is encouraged when one's focus is directed toward areas of progress made during each lesson. Furthermore, teaching students with ADHD has a broader impact than the transmission of musical knowledge. The learning tactics taught to students with ADHD may be transferred to other fields of study, providing them with advantages beyond music appreciation (Melago 2014, 43). Research supports the benefits of musical study, particularly demonstrating that music lessons have the potential to enhance brain processing in students. A study by Advantage Business Media noted that children participating in nine months of classes utilizing Orff-reminiscent instruments demonstrated an "increase in FA [fractional anisotropy] and axon fiber length in different areas of the brain" (Hidalgo-Tobon et al. 2016). The researchers suspected information gleaned from the study could lead to novel treatments for ADHD. Similarly, a 2011 study out of Dartmouth College reflected that the "visual, phonological, and executive memory" of musicians surpassed that of those who did not play an instrument. These results confirm the study of music is connected to an enhanced working memory. It also suggested the possibility that music lessons may increase one's attention span (George and Coch 2011, 1083, 1092). While this would benefit all students, it would particularly be noteworthy for students with ADHD who struggle with retaining information. Finally, pertinent research through the University of Toronto and Unity Health Toronto indicated that frequently listening to music that holds significance prompts the brain of the cognitively impaired to modify itself in a favorable manner (Johnstone 2021). This study warrants further research on the musical and cognitive outcomes of utilizing repertoire enjoyed by students with ADHD. It does suggest that a teacher's encouragement in the regular listening of well-loved tunes has the potential to enhance the brain plasticity of students with ADHD. With ample evidence that music lessons are a multi-faceted means of remedying the challenges of ADHD, the music teacher is positioned to have a lifelong impact in promoting the wellbeing of students.

The prevalence of ADHD learners in music classrooms and studios warrants specialized training in effective teaching methods for instructors. Elements of cognitive behavioral modification and optimal-stimulation theory may be considered in developing personalized educational techniques. Additionally, research supports creating a multisensory learning experience for music students with ADHD as it augments neuroplasticity. Teaching methods are not the only key to effectiveness; providing a holistic musical education requires the partnership between parents and teachers to be most successful. While the journey may be challenging, it is worthwhile in seeking to improve learning challenges, particularly in the areas of focus and memory.

Strategies and Resources Reference List

- Fulfill the need for adequate stimulation
  - Structure lessons around an assortment of activities
  - Incorporate computer software for sensory stimulation
  - Use sensory-based signals to point out significant information to students
    - Use colored or bold font to highlight important details
    - Provide aural signals for new lesson activities
  - Alter the order of the lesson
  - Reinterpret the rhythms or tonality of the accompaniment
- Utilize multisensory teaching methods
  - Encourage students to clap while reciting counts
  - Employ musical learning apps for areas such as rhythm, ear training, and note reading, e.g., Tenuto, Rhythm Trainer and Earpeggio
- Apply cognitive behavioral therapy (CBT) techniques to shape behaviors
  - Provide reliable consequences to mold behaviors
  - Utilize a behavioral contract attached to consequences decided by the student and their parents
  - Engage in regular feedback regarding student work
  - Teach personal evaluation through observing personal performance videos or a mirror
  - Offer positive reinforcement through a "token economy"

- Have the student fill out self-assessment forms and commend the demonstration of positive behaviors
- Utilize teaching techniques derived from CBM learning models
  - Create a planned schedule that includes interspersed activities involving movement
  - Model goal behaviors to students
  - Explain the purpose of activities in which students are reticent to participate
  - Teach students how to break down material into manageable areas of study
  - Discuss the management of practice time
  - Utilize mnemonic devices for note reading and to recall the steps for music lesson set up
  - Encourage students to maintain orderly lesson materials in an organizer
  - Offer short-term objectives such as brief pieces
- Shape an ideal learning environment
  - Minimize distracting elements in the teaching environment
  - Maintain a positive teaching atmosphere
    - Inquire after the student's wellbeing
    - Involve students in making musical choices
    - Coach students through frustrating material
    - Provide verbal rewards for exertion
  - Incorporate multisensory solutions to remediate deficiencies in pulse awareness
    - Have a parent tap the pulse on the student's back
    - Utilize a vibrating or pendulum style metronome
    - Conduct the student while a metronome is synchronously heard
    - Speak preselected words that identify specific rhythms
    - Integrate teaching philosophies that target one's sense of pulse and note reading
      - Orff Schulwerk
      - Kodály Method
- Nurture accurate note reading and processing with music printed on color paper, blown up or covered in plastic overlays
- Introduce new rhythms separately from other unfamiliar concepts
- Avoid singing the notes while the student performs if they are developing their music reading abilities
- Enhance motor control and body awareness through self-evaluation, breaking down movements into series of smaller steps, and participation in music and movement activities
  - Provide images of the student's current posture and their goal posture for comparison
  - Employ Dalcroze eurhythmics
- Support educational achievement through advocating for parental involvement in practice time management and guidance
- Encourage students to employ home practice tools
  - *Home Helper* by James O. Froseth
  - *Practicing Is for the Birds* by Susan Pascale
  - *Piano Adventures* by FJH Music Company
  - *Measures of Success* by FJH Music Company
  - *O'Connor Method* by Mark O'Connor
- Redirect negative student behaviors and confirm students are absorbing information
  - Engage students with evaluative questions
  - Direct students toward a specific music education tool
    - Egg shaker to demonstrate rhythm
    - Cloth employed during music and movement exercises
- Maintain communication with parents of students
  - Include questions regarding learning disabilities during the interview process

- Provide updated studio policy each year that includes an inquiry regarding accommodation requests
- Share observations with parents without diagnosing the student

- Provide accommodations for students with ADHD
  - Offer abbreviated lesson appointments, such as an option for two shorter segments each week
  - Select a time slot that does not surpass the effectiveness of ADHD medication
  - Keep the lesson moving to maintain engagement of student
  - Summarize the lesson at its close, incorporating questions to encourage student recall

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