



Trastorno por déficit de atención e hiperactividad (TDAH) en el aprendizaje de una segunda lengua

Attention Deficit Hyperactivity Disorder (ADHD) in second language learning

Transtorno de Déficit de Atenção e Hiperatividade (TDAH) na aprendizagem de um segundo idioma

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Resumen

El Trastorno por Déficit de Atención e Hiperactividad (TDAH) es un trastorno del desarrollo neurológico que suele comenzar en la infancia, pero que también puede persistir hasta la adolescencia y la edad adulta. Se caracteriza por un patrón de falta de atención, hiperactividad e impulsividad que interfiere con el funcionamiento y desarrollo diario. Por ello, investigaciones previas indican que, aunque es un concepto simple, un niño con TDAH no es capaz de controlarse a sí mismo, por lo que algunos de ellos muestran dificultades para completar las tareas y actividades de aprendizaje que se les asignan. El estudiante con este síndrome neurobiológico tiene dificultades para comprender y producir una segunda lengua. Además, la hiperactividad es el síntoma más común y llamativo en la mayoría de los niños, incluso si tienen un grado mayor o incluso menor (hipocinesia) del síndrome. En este estudio, se realizó un análisis integral para describir el ambiente de aprendizaje de los estudiantes con TDAH en el aula, basado en una revisión de la literatura. También se han analizado las siguientes categorías (interés por la lengua inglesa, actividades en el aula, disfrute del aprendizaje, capacidad más desarrollada y entorno). En consecuencia, los estudiantes con este síndrome neurobiológico muchas veces no pueden desarrollar habilidades cognitivas, porque no se les enseña con metodologías adecuadas, no cuentan con un buen ambiente académico de aprendizaje y en muchas ocasiones, sus niveles de aprendizaje cognitivo no son evaluados previamente. El aprendizaje del idioma inglés en niños de tercer grado con TDAH ha sido un verdadero desafío desde hace mucho tiempo, especialmente en instituciones ecuatorianas del cantón Latacunga, como la Unidad Educativa Juan Abel Echeverría y la Escuela de Educación Básica de Loja.

Palabras clave: hipocinesia; TDAH; aprendiendo; segundo lenguaje; comprensión; ambiente.

Abstract

Attention Deficit Hyperactivity Disorder (ADHD) is a neurodevelopmental disorder that usually begins in childhood, but can also persist into adolescence and adulthood. It is characterized by a pattern of inattention, hyperactivity, and impulsivity that interferes with daily functioning and development. Therefore, previous research indicates that, although it is a simple concept, a child with ADHD is not able to control himself, so some of them show difficulties in completing the tasks and learning activities assigned to them. The student with this neurobiological syndrome has difficulties in understanding and producing a second language. In addition, hyperactivity is the

most common and striking symptom in most children, even if they have a higher or even lower degree (hypokinesia) of the syndrome. In this study, a comprehensive analysis was conducted to describe the learning environment of students with ADHD in the classroom, based on a review of the literature. The following categories (interest in the English language, classroom activities, enjoyment of learning, most developed ability, and environment) have also been analyzed. Consequently, students with this neurobiological syndrome often cannot develop cognitive skills, because they are not taught with appropriate methodologies, they do not have a good academic learning environment and on several occasions, their cognitive learning levels are not previously assessed. English language learning in third-grade children with ADHD has been a real challenge for a long time, especially in Ecuadorian institutions in the Latacunga canton, such as the Juan Abel Echeverría Educational Unit and the Loja School of Basic Education.

Keywords: hypokinesia; ADHD; learning; second language; comprehension; environment.

Resumo

O Transtorno de Déficit de Atenção e Hiperatividade (TDAH) é um transtorno do neurodesenvolvimento que geralmente começa na infância, mas também pode persistir na adolescência e na idade adulta. É caracterizada por um padrão de desatenção, hiperatividade e impulsividade que interfere no funcionamento e no desenvolvimento diários. Portanto, pesquisas anteriores indicam que, embora seja um conceito simples, uma criança com TDAH não consegue se controlar, por isso algumas delas apresentam dificuldades em realizar as tarefas e atividades de aprendizagem que lhes são atribuídas. O aluno com essa síndrome neurológica apresenta dificuldades de compreensão e produção de uma segunda língua. Além disso, a hiperatividade é o sintoma mais comum e marcante na maioria das crianças, mesmo que apresentem um grau maior ou até menor (hipocinesia) da síndrome. Neste estudo, foi realizada uma análise abrangente para descrever o ambiente de aprendizagem de alunos com TDAH em sala de aula, com base em uma revisão da literatura. As seguintes categorias (interesse pela língua inglesa, atividades em sala de aula, prazer em aprender, habilidade mais desenvolvida e ambiente) também foram analisadas. Consequentemente, os alunos com esta síndrome neurológica muitas vezes não conseguem desenvolver competências cognitivas, porque não são ensinados com metodologias adequadas, não têm um bom ambiente de aprendizagem acadêmica e, em diversas ocasiões, os seus níveis de aprendizagem cognitiva não são previamente avaliados. A aprendizagem da língua inglesa em

crianças da terceira série com TDAH tem sido um verdadeiro desafio há muito tempo, especialmente em instituições equatorianas do cantão de Latacunga, como a Unidade Educacional Juan Abel Echeverría e a Escola de Educação Básica Loja.

Palavras-chave: hipocinesia; TDAH; aprendizado; segunda língua; compreensão; ambiente.

Introduction

In world-wide communication, mastery of the English language is well-recognized throughout Latin America. Nonetheless, particularly in an Ecuadorian context, many schools face difficulties in preparing students for the use of language. Aside from a large class size, infrastructure, didactic resources, curriculum mismatch among others, learners' disabilities, for instance, Autism, Down syndrome, and Attention-deficit/hyperactivity disorder (ADHD) have been the factors influencing the teaching and learning process. This is because, to some extent, teachers and school administrators are unaware of them and don't know how to deal with those types of learners. These neurodevelopmental disorders in conjunction with affective factors (e.g., motivation, attitude, anxiety), in fact, affect directly and indirectly the educational process. Paling (2020) defines ADHD as a neurodevelopmental and neurobehavioral disorder that can be presented in children, adolescents, and adults. In this sense, *attention deficit* refers to the lack of concentration to keep focus on the activity or task. *Hyperactivity*, meanwhile, focuses on the excessive movement that does not fit the environment, that is, something out of control. Thus, among various symptoms and characteristics for the inattentive and hyperactive deficit disorder, a person with ADHD may be considered (a) restrictively inattentive learner, (b) inattentive learner, or (c) hyperactive and impulsive learner (American Psychiatric Association, 2017). Both, the restrictively inattentive and the inattentive learner may show six or more inattentive characteristics (e.g., Difficulties to concentrate on tasks or activities, organizational problems, and frequent loss of necessary materials) but no more than two and three hyperactive-impulsive symptoms (e.g., talking or moving around excessively, interrupting others frequently) respectively. By contrast, the hyperactive and impulsive learner may have six or more hyperactive-impulsive symptoms (e.g., talk too much, tap their hands or feet, trouble playing or doing quiet activities) but less than five inattention characteristics (e.g., seem not to listen, have difficulty following instructions, are not able to pay much attention to details). Nonetheless, such symptoms and characteristics may be expressed at similar frequency and intensity (c.f., Tannock, 2013). Accordingly, in the last two decades, nearly

8.4% of children and 2.5% of adults in different contextual and learning environments have been diagnosed with ADHD (Kessler, R.C., et al. 2006; Danielson M.L., et al 2016). In this way, De Jongh and Wium (2021) state that students with ADHD have problems in learning concerning emergent literacy skills, including phonological awareness, which is necessary for the development of reading and writing skills. According to (Perold; Louw & Kleynhans, 2010), students with ADHD in the learning process should be supported and understood taking into account their needs and priorities. The authors also mention that teachers have an important role in this process such as supporting, and teaching according to the preferences and needs of each student. From the above, Shane and Doyle (2020) highlight that the difficulties that teachers very often experience with ADHD's students are related to the lack of ability to manage and support them. Thus, Ohan et al., (2008) claim that to provide instructional and learning activities, it is necessary to discover the influence of ADHD and how it affects the behavior and cognition of children with ADHD. On the other hand, Agustini, Yufiarti, and Wuryani (2020) mention that developing Android game-based learning media for children with ADHD may help in language acquisition. It is important to note that according to the Diagnostic Manual of Mental Disorders of the American Psychiatric Association (DSM-IV), 5% of children have ADHD, which affects boys more. Rosero (2017) mentions that the Ministry of Education registers 7,918 children with this disorder in public schools in Ecuador. Likewise, Tomalá (2022) reaffirms that there is the same number of children with this disorder in public schools, who receive classes with the rest of their classmates but with curricular adaptations, and students with special educational needs, not associated with disability, receive psychotherapy.

Literature review

This research study, considering the difficulties associated with ADHD, describes the behavior and performance of each student in his or her learning environment. Therefore, Idárraga and Rodríguez (2018) consider that students with (ADHD) in the English language learning process need motivation, sensory stimulation, and occupational workshops to improve academic performance. According to Ferrer (2020), the estimate of the global prevalence of (ADHD) is very heterogeneous within education or language learning, for this reason, this type of problem should be treated or identified early. In contrast, Torres (2018) mentions that students with attention deficit hyperactivity disorder always show that there is a low level of attentional efficiency and a low level

of concentration. As like result, they learn English with slow performance even with adaptations in the learning process. Similarly, De La Cruz et al., (2020) argue that language acquisition is a complex process and even more so for students with ADHD. Furthermore, Santana (2020) evaluating the variables of attention, inhibition, and cognitive flexibility, found that one of the challenges associated with this disorder is related to the diagnostic process, which is often not sufficiently accurate and presents errors.

According to Bhardwaj (2016), education should not only focus on a synthetic concept of learning but teachers have to focus on ensuring the transmission of their knowledge based on values that ensure a successful education with principles so that good caregivers can be formed. Maldonado, Joseph, Montoya, and Steven (2016) suggest developing methodological strategies to work with students with ADHD, as improvements in the school environment. Likewise, Cerrillo et al., (2018) mention that the student-teacher relationship and the learning environment play an important role in the learning of students with ADHD. In addition, Armstrong (2022) highlights that parental support for teachers is essential in the language learning process of students with ADHD. In the same line, Rivadeneira (2017) mentions that students with attention problems need extra reinforcement and homework to help them improve their English learning. She concludes that videos, posters, websites such as English Attack, group work, and workshops do positively influence English language learning in children with Attention Deficit Hyperactivity Disorder. In contrast, Cando et al., (2017) conclude that teachers' lack of knowledge of strategies for teaching students with ADHD is tricky in the English teaching-learning process.

On the other hand, Harun, Baharun & Othman (2018) mention that oral interaction facilitates language acquisition, making the negotiation process one aspect of the interaction that favors second language acquisition. Likewise, Kałdonek-Crnjaković, A. (2020) states that to adequately respond to this syndrome, teachers should take into account several approaches and adaptations in the classroom that ensure effective foreign language learning. Angulo (2021) adds that it is important to constantly monitor the learning process of students with ADHD. This monitoring process helps teachers address their progress, strengths, and reinforcement needs in order to adapt what is considered necessary in terms of activities, strategies, and evaluation.

In addition, thinking, feeling, and behaving well are some of the factors that education provides us with, thus contributing to the successful development of a person and society, as well as allowing us to develop human personality, individual thoughts, and also our social skills. Therefore, these

factors prepare people for different situations in life and create a status in society, where the person decides to settle. It is because having a quality education can give the individual self-confidence, positioning them to play an important role in the development of society (Al-Shuaibi, 2014).

Education is an important factor in the development of a society with values and principles, it provides human beings (students) with the necessary knowledge, as well as values and principles to live in a society with harmony and (in)equality of conditions. In addition to focusing on the transmission of knowledge, as previously stated, it is essential to focus on promoting values and principles in their students, forming their minds to be critical and analytical, and thus trying to build their own knowledge. It is estimated that between 20 and 40% of children with ADHD present a learning disorder, such as dyslexia, dysgraphia, and dyscalculia (SEPAP, 2014). Differential diagnosis is a challenge, the difficulty lies in identifying whether they are two different entities in the same patient with simultaneous onset or if ADHD caused the appearance of the learning disorder (Thomas E. Brown, 2010).

Studies in children with ADHD show that these patients present deficits in semantic, syntactic, and phonological organization, associated with loss of information, which leads to inadequate oral and written linguistic development (González-Castro et al., 2015; Gordillo V., 2014). What is clear is that learning disorders comorbid with ADHD lead to poor academic performance, so it is very important to identify them in order to act on them (SEPAP, 2014). It is also essential that teachers motivate their students to excel day by day and guide them to build their own concepts through appropriate methodologies for learning and thus create successful people who help the development of the country and have ethics and values as professionals. Based on the stated above, the present research explores the learning environment that students with ADHD have within their classroom. To achieve this goal, the following research question was addressed: What learning environments do students with ADHD and those without ADHD find most preferable? and how do ADHD disorders affect or influence students' academic performance?

Methodology

This research takes into account the qualitative and quantitative approach; therefore, surveys and interviews were applied to students from the "Loja" Basic Education School and the "Juan Abel Echeverría" Educational Unit. The mixed method approach used in this research is an extension of a quanti-qualitative research, and not their replacement, as the latter two research approaches will

continue to be useful and important (Johnson & Onwuegbuzie, 2004). The goal of using a mixed method is to build on the strengths and minimize the weaknesses of both quantitative and qualitative approaches (Johnson & Onwuegbuzie). Of course, the strengths and weaknesses of using different research approaches are not absolute as such, but relative to the context in which the phenomenon under study was addressed.

In this study, the participants were 32 students of General Basic Education (age range: 10 to 12 years old) from the Juan Abel Echeverría Educational Unit and the "Loja" School of Basic Education in the province of Cotopaxi, Ecuador. Twenty-one (21) children reported to have ADHD and the other 11 students with no ADHD were the object of study to compare and find out differences or common grounds within the classroom setting. The survey was applied and a psychological test was obtained by the Student Counseling Department (DECE), directly evaluating their oral expression skills in L2, curricular skills, cognitive area, and calculation. On the other hand, the behavior of each student, the difficulty to relate and onychophagia –*clinical name for fingernail biting* traits were discussed. The test was also used to identify the level of learning acquired by the students according to the level that each student is studying. (Annex 1-2-3). Therefore, an interview was structured and conducted for students with ADHD resulting in several situations presented within learning, such as the learning of English language, classroom atmosphere, and English teacher support.

Analysis and discussion of results

The following section describes the learning activities that students with ADHD and those without ADHD considered to be helpful when learning the English language, particularly in the development of the communicative ability. The collected data helped researchers know how students with ADHD and those without ADHD perceive the learning environment and difficulties that students with ADHD face in using the target language. Accordingly, data in table 1 (below) presents the most common learning activities that students by their self-perceptions considered appropriate to learn English.

Table 1. Would you like to learn English through:

items	Students with ADHD		Students without ADHD	
	<i>f</i>	%	<i>f</i>	%

Visual activities	11	52	3	27
Participatory activities	6	29	2	18
None	4	19	6	55
Total:	21	100	11	100

Source: Researchers.

According to the table 1 above, we can see the activities with which students prefer to learn the target language, English. It is determined that 52% of students with ADHD like to learn English through visual activities. In contrast, 55% of students without ADHD indicate that neither visual nor participatory activities are relevant to them. It is very important for language learning takes place to keep learners active, engaged, dynamic and enrolled in the process; this allows language learners to awaken their stimuli and self-confidence, and, as a result, they feel more motivated (Ohan, et al 2008). The students who get bored easily are those who have not managed to arouse their interest in dynamism, which is associated with energy, vigor, and the ability to adapt or evolve. And, as a consequence, language learners do not pay attention or make little effort in their school work; therefore, these students might not benefit from improved standards, curriculum, and instruction (Ali-Seven, 2020). On the contrary, students without ADHD showed different tendencies (visual 27%; participatory 18%) when learning English compared to students with ADHD's preferences. These differences shows that the activities, tasks and learning preferences for language learning are far to be considered homogenous by contrast they are completely heterogenous between students with or without certain learning disabilities.

Table 2. How classroom should be

items	Students with ADHD		Students without ADHD	
	<i>f</i>	%	<i>f</i>	%
Comfortable	6	29	4	36
Pleasant	7	33	2	18
Didactic	8	38	5	45
Total:	21	100	11	100

Source: Researchers.

Data in table 2 illustrates variation about how the ideal English classroom in creating an effective learning space should be. Thus, 38% of students with ADHD consider that the classroom should be didactic. That is, an effective English classroom should create a welcoming atmosphere where all students feel valued and respected, promote diversity in literature and perspectives to reflect the varied backgrounds and experiences of student, and employ methods that include interactive discussions and group activities (Ali-Seven, 2020). In the same vein, 45% of students without ADHD indicate that a dynamic/didactic classroom is essential for learning English since, according to Dörnyei (1990), it constitutes a motivational construct for foreign (and second) language learning. Nonetheless, it is important to establish an adequate classroom environment, in this case, a comfortable (with ADHD 29%; without ADHD 36%) and pleasant (with ADHD 33%; without ADHD 18%) space, so that the activities have a meaningful development that attracts the attention of the students. Determining a type of working environment in the classroom (comfortable, pleasant and didactic) can develop and enhance learning by making it fruitful (Dörnyei, 1990), addressing the needs of the learner in the classroom, and not forgetting that the types of learning play an important role.

Table 3. Level or degree of motivation when learning

items	Students with ADHD		Students without ADHD	
	<i>f</i>	%	<i>f</i>	%
Strongly agree	12	57	5	45
Agree	5	24	4	36
Disagree	4	19	2	18
Total:	21	100	11	100

Source: Researchers.

It can be seen from the data in Table 3 that more than half percent of students with ADHD (57%) reported to receive good treatments which motivate and keep them involved in the learning process. In the same vein, 45% of students without ADHD show similar tendencies and seems to agree with the treatment they received when learning the target language, English. Less than half percentage of the surveyed population indicate to accept the treatment (students with ADHD 24%, students without ADHD 36%) while others disagree with the treatment to learn the language (students with ADHD 19%, students without ADHD 18%). According to the results obtained from the survey, it

can be inferred that learning does not refer to what the student learns, but to how he/she prefers to learn (e.g., De la Cruz, 2020; Agustini et al., 2020; Angulo, 2021, Alvarado, 2011). Since learning is a mixture of cognitive, affective, and physiological factors, Dörnyei (1990) states that the teaching of English must be given in a propitious, adequate environment that motivates the students to feel comfortable so that they can understand and feel good and self-confident about what they are learning within different classroom environments.

Table 4. Being in the right environment inspires to ...

items	Students with ADHD		Students without ADHD	
	<i>f</i>	%	<i>f</i>	%
Learn the language	4	19	1	9
Share knowledge with my classmates	15	71	9	82
Participate in classes	2	10	1	9
Total:	21	100	11	100

Source: Researchers.

Table 4 presents an overview of learners' perspectives about what inspires them to keep up the good work within an effective learning environment. According to the survey, results from data above indicates that a great percentage of students with ADHD (78%) responded that the appropriate classroom settings help them sharing knowledge with their peers when learning the target language. Likewise, 82% of students without ADHD also reported that suitable learning environments inspire them understanding their perspectives and expectations about the learning process. In essence, positive correlations between a suitable "immediate learning environment" and students' willingness help "to take control of the learning process" (Dörnyei, 1990: 433-434), and reinforce the idea that creating a conducive and inclusive classroom benefits the entire student population. It emphasizes the importance of ongoing efforts to enhance educational practices and environments for the benefit of all students (c.f., Perald, 2010; Paling, 2020; Maldonado et al., 2016). Consequently, the learning environment and fellowship in the classroom play an important role, as Dörnyei (1990: 430) highlights, inspiring each student to develop and improve by fostering the development of their cognitive (think), conative (wants and desires), and affective (feelings and emotions) functions involved in any learning activity.

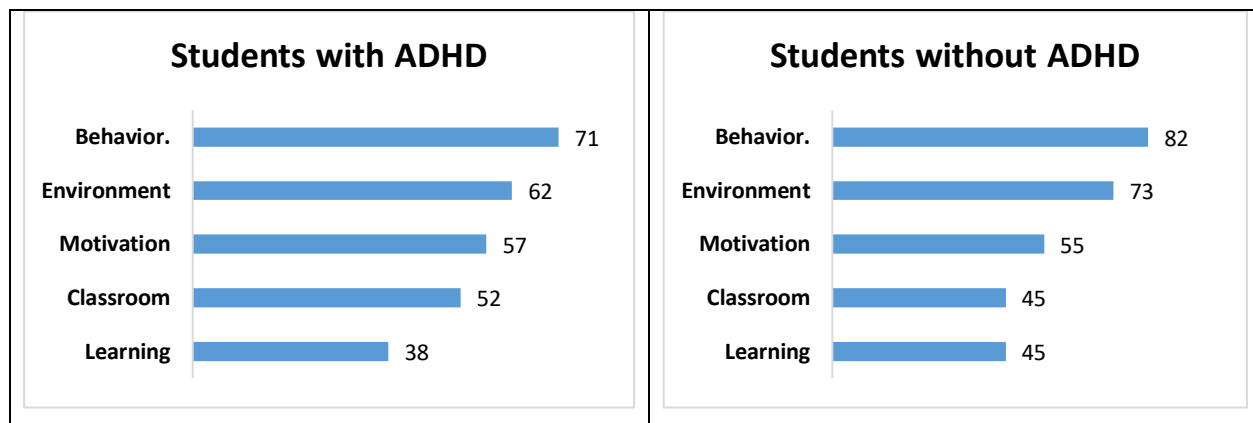
Table 5. Classroom behavior in ESL

items	Students with ADHD		Students without ADHD	
	<i>f</i>	%	<i>f</i>	%
Respectful	13	62	8	73
Friendly	6	29	2	18
Understandable	2	10	1	9
Total:	21	100	11	100

Source: Researchers.

As shown in Table 5 (above), 62% of students with ADHD indicated that classroom behavior should be respectful as well as friendly (29%). Similarly, 78% of students without ADHD agreed that the classroom should be polite and well-mannered, while 18% stated that it also should share friendly atmosphere. Therefore, optimal behavior in the classroom is paramount to ensure timely welfare in the learning process of the English language (c.f., Alvarado et al, 2011; Saavedra, 2016; Rivadeneira, 2017). Also, it helps the student to be active and “copes with the learning process, such as need for achievement (typical of the FLL context, in contrast to SLA context) and self-confidence” (Dörnyei, 1990: 435), by putting into practice all the knowledge acquired during class time.

On the other hand, data in Clustered Bar presents the percentage of the broader fields of education and psychological factors, namely (a) *learning*, (b) *classroom*, (c) *motivation*, (d) *environment*, and (e) *behavior*. These five factors illustrate the importance of each one of them within the classroom scenarios, in terms of learners’ expectations such as (a) learning preferences, (b) classroom scenarios, (c) student participation, (d) learning environments, and (e) student behavior in learning English as a second language.



Clustered Bar. Education and psychological factors

From the clustered bar above we can see that learning is perceived as somewhat less impactful for students with ADHD compared to those without ADHD. The classroom environment seems to have a higher perceived impact for students with ADHD in comparison with those of without ADHD. Motivation is seen as having a slightly higher impact for students with ADHD compared to those without ADHD. The environment is considered to have a higher impact for students without ADHD rather than those with ADHD. Behavior is seen as having a higher impact for students without ADHD compared to those with ADHD. These analyses and interpretations are based on the assumption that higher values indicate a higher perceived impact or importance in the five education and psychological factors. Nonetheless, it is important to note that these values are relative and depend on the context in which they were collected. The differences perceived in these different education and psychological factors might inform strategies and interventions for supporting students with and without ADHD. In practical terms, these values might suggest that, for students with ADHD, creating a supportive and positive learning environment, fostering motivation, and managing behavior are critical considerations. This information could guide educators and stakeholders in developing strategies and interventions tailored to the needs of students with ADHD. In summary, these factors intersect within the broader realms of educational psychology, cognitive psychology, and environmental psychology. Understanding how learning occurs, the dynamics of the classroom environment, motivational factors, and behavioral patterns contributes to effective educational practices and student development either students with ADHD or without ADHD.

Conclusions

In conclusion, the comprehensive analysis highlights the nuanced dynamics of educating students with ADHD, offering valuable insights into the perceived impacts of various factors. Recognizing ADHD as a common challenge affecting academic performance and classroom behavior, the analysis underscores the need for tailored strategies and interventions. Notably, learning is seen as somewhat challenging for students with ADHD, emphasizing the importance of multiple motivational strategies and a positive learning environment, in the sense that children can learn to manage their challenges with the right support. It can be deduced, then, that ADHD is a very common problem, affecting one in six children. It is important to recognize that ADHD can significantly affect academic performance and classroom behavior, knowing that there are a variety of treatments available to help children with ADHD, including medication and special education services.

As such, it is important to remember that ADHD is not a permanent condition and that children can come to manage their symptoms with the support of loved ones and professionals. Emphasizing the results obtained, it can be said that for an optimal teaching and learning process of the English language with students with ADHD it is necessary to use multiple strategies to keep them motivated in order to meet the classroom objectives. Therefore, creating an environment that inspires student to develop their cognitive, conative, and affective functions as Dörnyei (1990) points out, is crucial, especially for students with ADHD. Furthermore, it is essential to establish a space in which the student can feel comfortable and engaged as a safe place for learning, minimizing distractions and promoting better concentration within the classroom. In fact, according to the research results and the literature review (c.f., Dörnyei, 1990; Saavedra, 2016; Rivadeneira, 2017; Paling, 2020), it is essential to conduct a psychological assessment for students with ADHD to determine the degree of ADHD to ensure a meaningful teaching and learning process.

Finally, breaking complex concepts into manageable parts is an important element of learning for students with ADHD to organize and understand complex information. That is, instead of presenting the whole information, it should be broken down into manageable parts because this helps students concentrate better and retain the information given. The findings contribute to the ongoing conversation on optimizing the educational experience for students, fostering inclusivity, and promoting successful outcomes for all learners. In essence, the analysis offers a roadmap for

educators and stakeholders, emphasizing the importance of individualized approaches, supportive environments, and a holistic understanding of the unique needs of students with ADHD.

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