ADHD as a Factor Influencing the Choice of Vocabulary Learning Techniques in a Foreign Language

Agnieszka BŁASZCZAK
University of Warsaw
E-mail: a.blaszczak@uw.edu.pl, 🆔

Abstract: This article deals with specific educational needs in the context of foreign language teaching, with particular emphasis on attention deficit hyperactivity disorder (ADHD). The case study covered the situation of a student of applied linguistics diagnosed with ADHD in adulthood and was intended to show her functioning at a university in terms of the use of vocabulary learning techniques applied to practical classes of the studied language.

Keywords: ADHD, Specific Educational Needs, foreign language acquisition, vocabulary learning techniques, lexical competence, mnemonics, Pomodoro technique

Introduction

Over the past decades, Specific Educational Needs (SpLDs) in the context of language teaching and learning have gained in popularity. There are many studies dealing with SpLDs, especially in relation to the autism spectrum or dyslexia (e.g. Kormos/ Smith 2012; Kormos 2017). However, there are still few studies focusing on the impact of attention deficit hyperactivity disorder (ADHD) on foreign language acquisition, especially at higher levels of proficiency. The area of interest of this article is to look at how a student diagnosed with ADHD functions in the field of linguistics and how ADHD affects the acquisition of lexical competence. The aim of the article is therefore to analyze the vocabulary learning techniques used by the student in terms of their effectiveness in the acquisition of selected lexical material.

1. Definition of ADHD

Attention Deficit Hyperactivity Disorder (ADHD) is a chronic debilitating condition defined as a neurodevelopmental disorder that affects both children and adults (Peiman/ Masoome/ Leili 2015: 176). Individuals with ADHD may experience difficulties with maintaining attention (attention deficit) and/or controlling activity (impulsivity and hyperactivity disorder). Therefore teachers may believe that they never seem to listen to their instructions, are unable to sit still, perform activities without prior thinking, or are daydreamers. However, they probably understand what is expected of them but face difficulties with following instructions because of their lack

of details noticing or the overwhelming feeling of boredom, especially experienced while doing highly demanding tasks. Individuals with such characteristics may be perceived as undisciplined or less talented but in fact, they show symptoms of ADHD (O'Regan 2005).

It is estimated that the occurrence of ADHD varies between 3 and 7% worldwide (Peacock 2001) with an average of 5% according to the recent studies (Kałdonek-Crnjaković 2018: 216). Moreover, it is believed that ADHD is a hereditary disorder (Barkley 2006), which is not gender-specific. However, studies reveal that ADHD is more often diagnosed in males than females (Barkley 1997; Grunter 2013). It may be due to the fact that boys, especially at a young age, behave in a more disruptive way than girls which results in more frequent visits by psychologists who may notice early symptoms of ADHD. But the difference is that individuals usually grow out of naughty behaviour whereas symptoms of ADHD are present over a long period of time, sometimes even lifelong, occurring in different situations and affecting the ability to function socially and professionally at work (Kingsley 2012).

1.1. Manifestations of ADHD according to DSM-V

The recent update of the Diagnostic and Statistical Manual of Mental Disorder (DSM-V) (American Psychiatric Association [APA] 2013) reveals a change within the classification of ADHD among other disorders, namely since DSM-V ADHD falls under the category of learning difficulties and not under the behavioural ones as it was in the previous version (Kałdonek-Crnjaković 2018: 216). Consequently, it may result in an earlier diagnosis of ADHD among children struggling with learning difficulties as well as open a new research field focusing on the way ADHD affects the learning process (Tannock 2013). It should also be noted that ADHD often coexists with other specific learning difficulties, such as dyslexia (Kormos/ Smith 2012), language impairment (Mueller/ Tomblin 2012), autism spectrum disorder (van Steijn/ Richards/ Oerlemans et al. 2012), etc. It is estimated that the co-occurrence of ADHD and other specific learning difficulties, especially dyslexia, amounts to 45% (DuPaul/ Gormley/ Laracy 2013).

According to the Diagnostic and Statistical Manual of Mental Disorder (DSM-V), there have been identified three subtypes of attention deficit hyperactivity disorder: ADHD – predominantly inattentive type, ADHD – predominately hyperactive-impulsive type, and ADHD – combined type (Paszkiewicz 2012; Turbiarz 2004).

The first type – predominantly inattentive one (with 6 or more inattentive symptoms but 3-5 hyperactive-impulsive symptoms) – is a subtype of ADHD observed more often in females than in males. It boils down to difficulties with concentration, which makes the person easily distracted, run away with thoughts, and give the impression of not listening to what is being said to them. Problems with concentration translate into less effective work of the person affected, many times below their capabilities. Individuals suffering from this subtype of ADHD do not cause behavioral problems, which makes the diagnosis of this subtype less frequent, and they do not receive the support and therapy they need. As a result, they are considered less capable.

The predominately hyperactive-impulsive type (with 6 or more hyperactive-impulsive symptoms but 5 or fewer inattention) is manifested by the above-average mobility of the person and a tendency to perform a number of activities at the same time. Individuals with this subtype of ADHD have a hard time sitting in one place, often disrupting lessons and being perceived as naughty.

The last one – combined type (manifesting all symptoms at equal intensity) – is considered to be the most common one, especially in children because it is characterized by all the symptoms of hyperactivity, which makes children experience difficulties with impulse control, which translates into restlessness and attention deficit disorder.

In diagnosing ADHD, it is crucial to recognize the right type of disorder that an individual is facing in order to be able to apply the appropriate therapeutic or pharmacological treatment. Given that ADHD often co-occurs with other disorders, it is extremely important to rule out medical, emotional, or environmental factors that could potentially cause similar symptoms when making a diagnosis. An accurate diagnosis is crucial because it determines the child's functioning at school and further existence in society. A teacher who is aware of the presence of ADHD in a student should not limit himself/herself to reducing the requirements. Therefore, a medical certificate in itself should not be an excuse for a student's laziness or bad behavior. Awareness of the presence of attention deficit hyperactivity disorder in a child should be the basis for taking the necessary steps by teachers, parents, and the child himself/herself in order to improve the comfort of functioning in school and private life.

2. Process of vocabulary learning in a foreign language

Learning a foreign language is a complex cognitive and metacognitive process dependent upon various factors. A foreign language learner should acquire skills within the knowledge of syntax, vocabulary, phonology, and orthography (Bachman/ Palmer 1996) along with strategic competence (Hulstijn 2011). The development of all these skills is closely related to working memory, the deficit of which is one of the main causes of specific learning difficulties appearing, among others, in the case of ADHD. The scale of the problem depends on the individual's cognitive profile thereby emphasizing the importance of differences in language acquisition (Ehrman/ Oxford 1995).

The subject of interest of this article is the ability to learn vocabulary, which requires discipline, regularity in repeating the material, high concentration of attention, and perseverance. In the case of people with ADHD, a creative approach to working on new lexical material may also be crucial. Therefore, it is necessary to ensure that learning vocabulary is not associated with tedious work, but at the same time, it must provide satisfactory results in the form of acquiring and remembering the selected lexical material.

When writing about vocabulary learning in the context of effective memorization, it is impossible to omit the mental lexicon. The mental lexicon can be defined as a multifaceted and dynamic network with numerous semantic and phonetic connections that are coupled with all sensory channels (Roche 2008). During the reception, words

pass through perceptual channels (auditory and visual) from short-term memory to long-term memory, whereas during language production, words are in turn extracted from long-term memory, pass through short-term memory, and then are articulated or written down. The mental lexicon contains phonological, morphological, semantic-conceptual, and syntactic information (Handke 1994). Legutko-Marszałek (2008) emphasizes that a user fluent in a given foreign language extracts the above information unconsciously.

Vocabulary mastery means the ability to use the subsystems of a given language as well as language skills. This means that a student knows a new word if they can recognize, understand, pronounce, write, and use it in context. However, not only these aspects make up lexical competence, which is an essential element of effective communication in a foreign language. Lexical competence is the vocabulary and knowledge about this vocabulary as well as the ability to use this knowledge in a specific communication situation. The learner should not only be able to relate words to each other, but also to justify the choice of specific words: "manipulate words, relate them to other words and to their own experiences, and then justify their choices" (Sökmen 1987: 242). Targońska (2011a) extended this definition by claiming that when a student lacks a word, he or she can apply compensatory strategies and use another one that fits the context.

Difficulties that foreign language learners encounter when acquiring vocabulary include: remembering new words and then recalling them from memory (Biedroń 2009). Targońska (2011b) points out that many times, even students undertaking linguistic studies have poorly developed lexical competence. The reason for this can be found in bad learning habits from previous education stages, such as learning isolated words.

The role of the teacher at all stages of education should be to present learners with possible ways of approaching learning and to help them choose the most effective strategy for their preferences and abilities. The more advanced a given student is in learning a foreign language, the more important it is to check aspects of vocabulary acquisition such as variety, accuracy, or appropriate use of the word to the situation. It is also extremely important to build on the knowledge that students already have and refer to their experiences when introducing new lexical material. The human brain absorbs new material faster when it can match new information with what it already possesses, so building on lexical knowledge that students have already mastered is a good approach when teaching vocabulary.

2.1. Memorization and vocabulary learning techniques

Mnemonics are techniques of learning and memorization, the aim of which is to activate, improve, and increase the effectiveness of the learning process. They play a key role in the acquisition of vocabulary in combination with the knowledge of the rules of its use in context, grammar (inflection), and pronunciation. As a result of the use of the selected mnemonics, learning vocabulary becomes easier and more effective by adjusting it to the needs and skills of a given student. There are many examples of

mnemonics, e.g. word lists, images with captions, creating a story with a given group of words, using acronyms, keywords, mind maps, and many others.

The most common of these mnemonics is word listing. New words are written from top to bottom, with the translation into the native language next to them. We try to remember the written words and their foreign equivalents. This is an effective technique, but we tend to remember best the words listed at the top and those at the end of the list, while the words written in the middle are not easily assimilated. This is known as the primacy effect (we remember information from the top of the list best) and the recency effect (we remember information from the bottom of the list best). Therefore, using this popular technique, one should change the order of words on our list or divide it into smaller parts, group them thematically, or underline those words that give us the greatest difficulty. An interesting solution is also the use of Internet applications that randomize the order of words from the lists entered, as well as offering the possibility of testing their knowledge in random order. Examples of such applications are *Memrise, Quizlet, Fiszkoteka*, or for testing knowledge by creating *Kahoot! tests yourself*. Digitization of the learning process is desirable in the era of computerization of the world and the widespread use of computer tools.

Other mnemonics are image-based learning. As we think in pictures, combining the learning of new vocabulary based on pictures makes it easier to remember even the most abstract words. A certain individual association of the image with a given word should be created, which will facilitate the assimilation of the word. For longer lists, learners can choose a storytelling technique, i.e. combining new words together to form a story. The more unusual and abstract the form of the story itself, the easier it will be remembered by us and will enable us to assimilate the vocabulary.

In the case of words with complicated orthography, an interesting solution is the acronym technique, where the learner proposes a phrase consisting of words beginning with the first letters of the words they want to remember. Another mnemonic technique that works well in these situations is keywords. It is a technique that usually uses the phonetic similarity of words from the foreign language to the words of the native language and boils down to creating a mental image that helps to remember the new word.

The next two techniques of memorizing vocabulary are connected with the creation of diagrams or trees connecting words into certain wholes. On the one hand, it is grouping, i.e. organizing lexical material into logical groups within the same thematic scope, e.g. the human body, character traits, farm animals, etc. A more developed technique of building associations can take the form of creating a mind map. It is a technique used by teachers during language classes to introduce new vocabulary, and a diagram or tree prepared in this way can also be used to consolidate a given lexical material. One keyword is written in the centre of the blackboard or piece of paper, around which further associations are built. Added associations may have the same grammatical form as the original word (i.e. nouns, adjectives, etc.), but they may also take the form of idiomatic expressions, collocations or idioms.

The choice of mnemonics should be conditioned not only by the preferences of the person learning a given lexical material but also by limitations resulting from specific learning difficulties, such as ADHD, dyslexia, etc., which significantly affect the acquisition of vocabulary.

2.2. Pomodoro technique as an example technique of vocabulary learning

The Pomodoro technique (from Italian: pomodoro "tomato"), developed by Francesco Cirillo in the 1980s, is a method of time management that is currently gaining popularity. It is a tool that is supposed to teach you to focus on tasks without distracting yourself. It consists in using the alarm clock to divide the work into 25-minute sessions, the so-called *pomodori* (the length of individual time sections can be adjusted to individual preferences), and the following break time. The name *pomodoro* comes from the kitchen timer that Cirillo used in his first experiments (cf. Fig. 1).

Fig. 1. The tomato-shaped kitchen clock, which gives its name to the technique developed by F. Cirillo

The method is based on the assumption that frequent breaks can increase work efficiency. The starting point is the development of a list of tasks to be performed, e.g. learning a prepared list of vocabulary divided into smaller segments enabling mastering a selected range in a given time section. After specifying the goal, one should set the timer (it can be a kitchen timer, or an alarm clock on the phone, but online applications based on the Pomodoro technique are also effective, e.g. *Focus Keeper, Tide, ClearFocus: Pomodoro Timer, PomoDone, Timork,* and others) to the preferred time section. This is usually a 25-minute unit, but one can make it longer or shorter as preferred. In the case of a student with ADHD, shorter time sections, i.e. 15 minutes, can work better, allowing one to work in full concentration. Before starting the timer, it is exceptionally important to turn off all devices that could interfere with work and distract attention (messages, calls, and notifications on the phone, e-mail box, etc.). If sharing a room with other people, it is advisable to ask not to be disturbed during an ongoing section. The vast majority of concentration problems are due to the incorrect response to distractions. When we hear a familiar sound on the phone, we are distracted from our work, and in the case of a neuroatypical person, refocusing translates into extra effort and wasting time. After the *pomodoro* is finished, the alarm clock rings, which means a break in work and a 5-10 minute

break (the length of the break also adjusts to individual preferences). It is recommended that the break is associated with a form of physical activity, e.g. preparing something to drink, or eat, or throwing away the garbage to give vent to the energy accumulated during work. After the break time has elapsed, the alarm rings again and one can move on to the next work session. After four such sessions, one should take a longer rest break.

The Pomodoro technique owes its effectiveness to a clear work pattern (we focus on one task) and full concentration (it is "only" a 15-20 minute section, after which one can rest for a while). Thanks to a clear scheme and a doable list of tasks, working with this technique brings visible results, which also increases the level of satisfaction with the tasks performed. In the case of prolonged use of this technique, we also learn to react more calmly to any notifications and distractions from the environment. At first, it may seem difficult not to check the phone or currently popular social media, but after some time, one can get used to it while seeing measurable results. In the case of people with neurodevelopmental disorders, its effectiveness is also high, because it allows you to look at your own productivity and the ways or factors that most often distract, and ultimately it leads to the acquisition of the ability to manage one's own time, especially in situations of accumulation of tasks, such as during an exam session on studies.

3.   Introduction to the case study: ADHD and vocabulary learning

ADHD accompanies people throughout their lives, during which they have to face its symptoms. What changes over the years is the severity of the symptoms because some difficulties subside, but new ones may appear in their place. Undoubtedly, neuroatypical people affected by ADHD need specialist support and help, without which it is difficult for them to function. Therefore, parents (at a younger age) and teachers (throughout the education time) play a key role here, supporting a person from an early age who has special educational needs, but who, at the same time, in accordance with the assumption of inclusive education, attends classes in mainstream schools, and after Matura exams chooses mainstream universities.

Every year, universities enrol candidates suffering from various types of neurodevelopmental disorders (including autism spectrum, Asperger's syndrome, ADHD, anxiety disorders, depression, dyslexia, and many others). During their education, they face various difficulties resulting from, among others, insufficient satisfaction of their specific educational needs. It should be remembered that study programs are not differentiated according to the limitations of a given disorder, which means that students follow the same core curriculum as others not affected by any disorders.

3.1. Research objectives

The aim of this article is to present the results of the study on the functioning of a first-year student of applied linguistics at the University of Warsaw, who was diagnosed with ADHD (combined type: inattentive & hyperactive-impulsive) only in adulthood

(1,5 years prior to participating in the study), and to look at how she manages to acquire lexical competence over the study period.

Linguistic studies require, among others, learning of various lexical materials, which is associated with regular and quite monotonous assimilation of word lists of the studied language. The assumption of this case study is not to formulate any generalizations due to the statistically insufficient selection of the sample, but to draw attention to the situation of students affected by neurodevelopmental disorders, ADHD in particular, and to show how they can cope with learning the examined competence at linguistic studies.

3.2. Research methodology

There are many possibilities and techniques for learning vocabulary (see: *2.1. Memorization and vocabulary learning techniques*), and all of them have one common goal, i.e. the acquisition of lexical competence. Regardless of the choice of technique that fits the learning style of a given person, the acquisition of new vocabulary requires high concentration on the task. At this point, a research question should be formulated: What technique will be most effective for a person with ADHD who suffers from attention deficit disorder, who has a racing mind, and who is characterized by a multitude of attractive ideas scrolling through the mind at any time, which makes it difficult to carry out the assigned tasks.

The research scheme included an interview in several sessions with a student of applied linguistics diagnosed with ADHD, and made it possible to capture the individual and contextual dimension of the student's functioning among other students not affected by this neurodevelopmental disorder. The starting point was a real didactic material taken from one of the practical German language courses at university. The vocabulary was new to the student and required assimilation before the test. It encompassed the terminology related to religion and cults. Students read a text during the lesson, highlighted and explained new vocabulary, and afterward were asked to memorize it, as the results of the vocabulary acquisition would be checked in the form of a test two weeks later. Therefore within two sessions of individual interviews, we discussed the possibilities of choosing mnemonics in terms of the student's preferences, the time needed to prepare learning materials, and their effectiveness in long-term memorization. The student, due to previous positive experiences and short preparation time compared to other mnemonics, chose to create a vocabulary list from the selected lexical material.

The student prepared vocabulary lists with great commitment. The way the words are presented deserves special attention. Masculine nouns are printed in blue, feminine in pink, and neuter in green[1]. Adjectives, collocations and other expressions were marked by the student in black. As we can see in the pictures (Fig. 2 and Fig. 3), the order of the words in the list is random, there is no alphabetical or grammatical order of the words. An interesting element comes down to some arrows with references

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[1] German nouns possess a grammatical gender. The three genders are masculine, feminine, and neuter.

connecting related expressions in pairs (derived forms, e.g. a verb and a noun or adjective derived from it), as well as additional student notes created after the materials have been printed. The printout of the word list was made on pastel green paper, which unfortunately is not sufficiently visible in the attached pictures, and which is also important for the student when working with the didactic material (positive experiences).
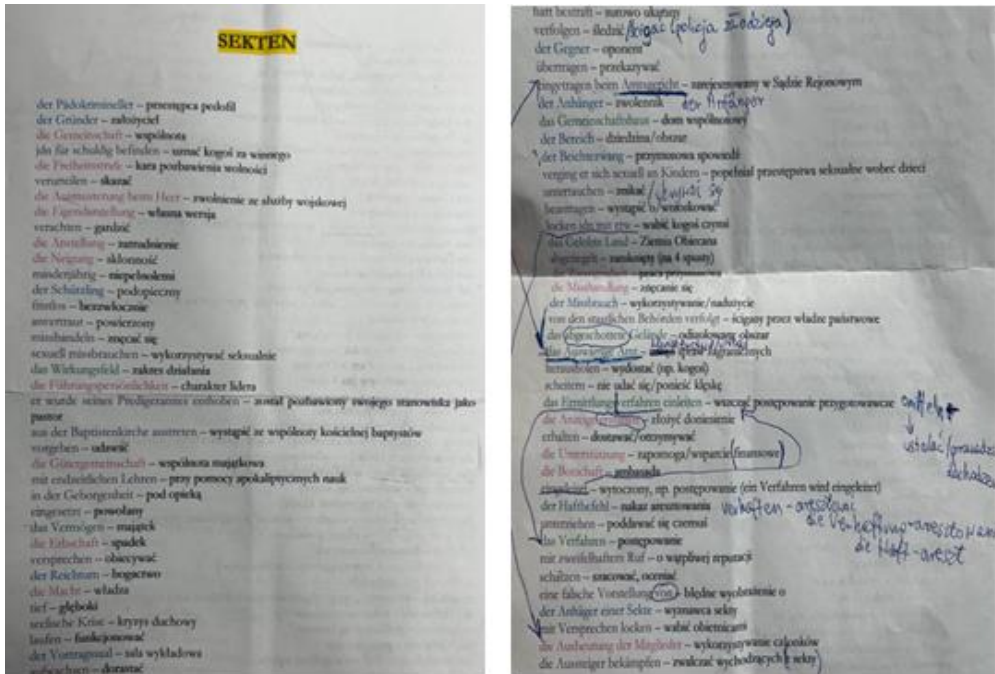

Fig. 2 and Fig. 3. Didactic materials prepared by a student from a selected semantic field – religion and cults.

3.3. Research results

The prepared lexical material was the basis for the student to acquire the given vocabulary for the upcoming test, but the question remained unanswered: how a person with attention deficit disorder combined with hyperactivity would sit still in order to memorize the list and learn vocabulary effectively, regardless of the high attractiveness of the prepared material. The Pomodoro technique, chosen and practiced by the student for some time, turned out to be the key here.

During the semester, the student faced the challenge of combining a number of responsibilities simultaneously, such as completing assigned homework, participating in projects, studying for tests, as well as many extracurricular activities (including family and professional obligations). For this reason, the student learned to effectively divide the time by creating lists of tasks to be done, arranged according to deadlines and priorities. Effective time management enables, in the case of the co-occurrence of attention deficit disorder, to complete tasks within the set deadlines and also helps to

counteract the so-called procrastination, i.e. postponing the implementation of certain tasks.

As a result, the student, while learning the terminology specified in the study, divided the prepared list into smaller parts. In line with the principles of the Pomodoro technique, the student took regular breaks, necessary due to the brain neurobiology. She perceived breaks as rewarding herself for effective work and full concentration during individual *pomodori* sessions. By repeating the vocabulary lists, enriched in colors in accordance with the description presented in the research methodology, she managed to effectively learn the planned scope, which resulted in passing the test.

The last interview took place after receiving information about passing the test in order to formulate conclusions. The student found the vocabulary acquisition technique she chose to be the most effective and will undoubtedly continue to use it while studying applied linguistics. However, it should be remembered that the characteristics of attention deficit hyperactivity disorder vary greatly, i.e. vocabulary acquisition techniques that are effective for one person with ADHD may not be as effective for other ADHD students because they may have a different presentation of the neurodevelopmental disorder itself, which will manifest itself, for example, in increased need for movement, excessive impulsivity or memory difficulties. Nevertheless, the research conducted in the form of a case study is an interesting didactic perspective worth considering in the case of people suffering from ADHD and striving to learn a foreign language, especially lexical competence.

Conclusions

This case study is only a part of the whole, but it shows an interesting research perspective, the aim of which is to help people with ADHD learn the language effectively by selecting a technique that suits their limitations resulting from attention deficit disorder and hyperactivity disorder. Hence, a combined technique of using mnemonics in the form of creating a word list, enriched with predetermined colours of the font and paper, together with the Pomodoro technique helping to manage the time of learning effectively proved successful, as the students passed the test.

It should be emphasized that lexical competence, which includes learning vocabulary in a foreign language, is an important part of communicative competence, which is why it is extremely important in the process of teaching and learning foreign languages. The level of mastering lexical competence has a direct impact on coping with a specific communication situation, because it determines the fluency, adequacy and effectiveness of speech. Only thanks to the ability to use words in accordance with their meaning, with the correct pronunciation, with the correct spelling (in the case of written communication), and also in the correct context, we can talk about communication success. Achieving a high level of lexical competence in a foreign language is a long-term and complex process, requiring a lot of work, as the lexical system is the most open language system. Numerous techniques are used to expand the lexis, and modern didactic practice certainly puts great emphasis on improving the lexical skills of pupils and students.

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