

Learning strategies evaluation in students with attention deficit hyperactivity disorder

SIMONE APARECIDA CAPELLINI, ADRIANA MARQUES DE OLIVEIRA

Riassunto: *Questo studio ha come obiettivo quello di verificare l'uso di strategie di apprendimento negli alunni di scuola primaria con diagnosi multidisciplinare di Disturbo di Attenzione ed Iperattività (ADHD). L'articolo presenta il campione, gli strumenti utilizzati per la valutazione cognitiva e metacognitiva e i risultati significativi per la comprensione dei processi di insegnamento-apprendimento in classe.*

Abstract: *This study aim to verify the use of learning strategies in students of the elementary level presenting interdisciplinary diagnosis of attention deficit hyperactivity disorder (ADHD). Nine students, male gender, attending 3rd to 9th grade level of the elementary level, average age 10 years and 7 months, presenting interdisciplinary diagnosis of attention deficit hyperactivity disorder (ADHD). The students were submitted to the application of the Evaluation of Learning Strategies from elementary level – EAVAP-EF – scale, which aimed to evaluate the strategies reported and used by students in situation of study and learning, as follows: cognitive strategies, metacognitive strategies and absence of dysfunctional metacognitive strategies. The general result at EAVAP-EF scale, showed that students with ADHD reached the percentile 25%, considered as low performance in the use of the learning strategies. For the variable absence of dysfunctional metacognitive strategies, the students presented percentile 30%, percentile 25% for cognitive strategies and 55% for metacognitive strategies. The results showed that ADHD students do not use effectively the learning cognitive and metacognitive strategies and present the use of dysfunctional metacognitive strategies. These alterations match with the framework of ADHD because the entry of information, either visual or auditory, showed alterations, derived from inattention, which affected the learning in classroom situation.*

Key-words: *learning, learning strategies, attention deficit hyperactivity disorder.*

Introduction

The attention deficit hyperactivity disorder (ADHD) it's a neuropsychiatric disorder most common in childhood, one of the chronic disorder

ders among school-age children, presenting characteristics like: inattention, hyperactivity-impulsivity and alterations in executive function, that includes processes responsible for: planning, organizing, focusing, guiding and integrating the cognitive functions, among them, the midst alertness, sustained and selective attention, that could vary in high or lower degree, frequently associated to everyday life activities, academic life and social relationships (American Academy of Pediatrics, 2000; American Psychiatric Association [APA], 2000; Barkley, Fischer, Smallish, Fletcher, 2002; Faraone, 2003; Capovilla A., Cozza, Capovilla F., Macedo, 2005; Kessler *et al.*, 2005; Pastura, Mattos, Araújo, 2005; Graeff, Vaz, 2006; Matos *et al.*, 2006; Capovilla, Assef, Cozza, 2007; Saboya, Saraiva, Palmini, Lima, Coutinho, 2007).

The students with ADHD present failures in their academic history, that is, determined by alterations in information entry (Banaschewski *et al.*, 2006; Capellini, Ferreira, Salgado, Ciasca, 2007; Van der Leij, Morfidi, 2006), which affects directly the ability of capturing stimulus, which in medium and long term, affects particularly, the contents acquisition (Relvas, 2007).

The teaching-learning process involves an active role of the student, being important, the development of the capacity to establish their own goals, to plan and to monitor their efforts looking for a good academic performance (Souza, 2010). However, for the student to get involved in his/her own learning, it becomes necessary to teach the appropriate learning strategies, to enable an expressive improve in their academic performance (Boruchovitch, 1993; 1996). The learning strategies are techniques that students use to acquire, store and to use the information, in which different resources are required to learn a new content, or to developed some skills, which can be generalized for learning others tasks and contents, or restricted to a specific task (Dembo, 2000; Souza, 2010).

Oliveira, Boruchovitch and Santos (2010), refer Valdés (2003) and Almeida (2002), in the statement that, to be strategically is much more than using technique and methods to learn, because the student stands in and active and mediate way at the learning process, whereas, the significative learning should occur by methods that promote the initiative and the responsibility from the student in his/her own learning.

The learning strategies are responsible for cognitive process as a whole, assisting the student to organize, store and to elaborate the information. One strategy of learning involves different resources used by students to

learn a new content, or to develop certain skills, that could be comprehensive and generalize to the learning of various tasks and contents or restrict to a specific content (Oliveira, Boruchovitch, Santos, 2010; Souza, 2010).

The learning strategies could be divided into cognitive and metacognitive, however, they must occur in an integrated way in order to occur a complete learning (Costa, Boruchovitch, 200; Oliveira, Boruchovitch, Santos, 2010). The learning strategies refer to behavior and thoughts that provide the information to be efficiently stored, related to the fact that people should comprehend the parts, in order to understand the whole, being directly related to the execution of tasks. The metacognitive strategies are strategies that the student uses to plan, monitor, regulate and evaluate the cognitive strategies, which imply organization, regulation and the evaluation of the use of cognitive strategies (Dembo, 1994; Dembo, 1994; Souza, 2010; Oliveira, Boruchovitch, Santos, 2010). The metacognitive strategies are more complex, because they present the function of administration the process and involves self knowledge from the student, the knowledge of the academic tasks and which strategies should be used in each moment (Dembo, 1994; Oliveira, Boruchovitch, Santos, 2010).

The Evaluation of Learning Strategies from Elementary Level Scale (EAVAP-EF) was proposed by the authors Oliveira, Boruchovitch and Santos (2010) to be used at the psychoeducational diagnoses of the learning disabilities, identified in children from elementary school, as well to be used in other areas that need an alternative test from people at the same level of schooling that shows difficulties to study and learn.

Based on the aforementioned, this paper aimed to verify the use of learning strategies in students from elementary school, with an interdisciplinary diagnosis of attention deficit hyperactivity disorder – ADHD.

Material and Method

Nine students, male gender, attending 3rd to 9th grade level from elementary school, average age 10 years and 7 months old, with attention deficit hyperactivity disorder (ADHD) participates in this study.

The diagnosis of ADHD was accomplished by an interdisciplinary team of the Investigation of Learning Disabilities Laboratory – LIDA/FFC/UNESP/Marília – São Paulo – Brazil, including speech language thera-

pist, pedagogical, neuropsychological and occupational therapy evaluations following the criteria proposed by DSM-IV (American Psychiatric Association [APA], 2000). The socioeconomic classification status was based on statistical analysis of socioeconomic development index (IDESIA, 2003), ensuring this way the homogeneity of the sample in terms of socioeconomic status.

In this study, the students were submitted to the application of Evaluation of Learning Strategies from Elementary Level Scale (EAVAP-EF, Oliveira, Boruchovitch, Santos, 2010). The EAVAP-EF Scale aimed to evaluate, through a set of questions, the learning strategies reported and used by elementary school students in study and learning situation. More specifically, to identify their cognitive and metacognitive strategies, as well the absence or not of dysfunctional metacognitive strategies.

The EAVAP-EF Scale is an easy manipulation device to be applied by the applicator and also easy for the evaluated. There are 31 questions related to the activities of learning and study, arranged in a likert scale of tree points, with tree alternatives: always, sometimes and never, that enable to investigate if the student uses some type of strategy at the learning moment and identify it, in which it is possible to define a strategically behavior profile directed to learning, used by the students. There are tree evaluated strategies:

1. Absence of dysfunctional metacognitive strategies: items that revealed the low frequency of dysfunctional strategies used at the study moment.

2. Cognitive learning strategies: include items that require strategies considered simple to achieve learning, as follows: essay that involves tasks like: trials comprising tasks to copy the whole lesson, underline, to ask and answer, repeat, elaboration, which involves tasks to paraphrase, summarize and to create analogies and organization, with tasks like selecting ideas and make guides or maps.

3. Metacognitive learning strategies: include items that require higher strategically behavior, because it involves understanding the learning process, itself, as follows: monitoring, that involves understanding tasks and regulation, which includes tasks as reread, revise and adjust the strategy – ask for help.

The higher the total points scored by the student, higher the tendency that he is a strategic student. The punctuation, general and from subscales,

are interpreted following the data of percentile and average of points scored by the student. The evaluator can opt for interpreting the results by the percentile values obtained for the normative sample or percentiles discriminated, due to the age of the student.

For the application, it was necessary the sheet answer paper from EAVAP-EF, pencil and eraser. The correction was accomplished using the correction guide, available at the manual from EAVAP-EF, attributing a score from 0 to 2 for each answer given answer of the student.

The students were evaluated after 30 minutes of the administration of the medicine (methylphenidate), because, in the absence of the medication it was not possible to carry on the evaluation proposed in this study. The evaluation scale was applied in one day, approximately 30 minutes, for each individual. The evaluator read the instructions of each question, and only read the next if the student had answered the previous question

The data was tabulated in an Excel spreadsheet and transferred to Stata, version 10.10, for the statistical analysis. The descriptive analysis was accomplished (average, standard deviation, minimum and maximum value, median, percentile 25 and 75).

Results and discussion

The results comparison of this study will be accomplished based at the normative sample presented by Oliveira, Boruchovitch and Santos (2010), at the application manual from EAVAP-EF.

Table 1, presents the description and results obtained by the characters of this study at the evaluation of learning strategies from elementary level – EAVAP-EF – Scale, considering the age, or each student.

Participant	Y.G.C.L	L.R.S.A.Z	G.C.M.S	A.J.S.M	G.Y.E	J.V.S.R	R.L.N.Z	V.M.C	G.B.D
Age	10:8	8:11	14:3	9:2	8:3	13:10	10:11	10:1	10:4
Grade Level	6 th	3 rd	9 th	4 th	3 rd	6 th	5 th	4 th	4 th
Absence of metacognitives dysfunctional strategies	Total Score	13	16	17	20	8	20	12	18
	Percentile Age range	5%	60%	30%	55%	5%	55%	10%	35%
Cognitive Strategies	Total Score	7	6	19	6	11	3	5	3
	Percentile Age range	25%	20%	95%	15%	60%	10%	10%	10%
Metacognitive Strategies	Total Score	10	11	8	7	10	13	13	9
	Percentile Age range	45%	65%	35%	25%	45%	95%	95%	50%
TOTAL	Total Score	18	33	44	33	29	36	30	30
	Percentile Age range	5%	45%	75%	25%	25%	40%	15%	15%

Table 1. Description and results obtained by the characters of the ADHD students at the Evaluation of Learning Strategies from Elementary Level Scale (EAVAP-EF).

Table 2 presents the average distribution, standard deviation, minimum and maximum value, median and percentile of the performance scored at the evaluation of learning strategies from elementary level – EAVAP-EF – Scale and Table 3 presents the general punctuation analysis scored and from each subscale at the EAVAP-EF scale.

Variable	Mean	Standard Deviation	Minimun	Maximun	Percentile 25	Median	Percentile 75
Absence of metacognitives dysfunctional strategies	14	6,23	1	20	12	16	18
Cognitive Strategies	7	5,01	3	19	5	6	7
Metacognitive Strategies	10	2,27	7	13	8	10	11
TOTAL	31	7,18	18	44	29	30	33

Table 2. Distribution of mean, standard deviation, minimum and maximum value, median and percentile of the performance scored at the Evaluation of Learning Strategies from Elementary Level Scale (EAVAP-EF).

Variable	Mean – Total Score	General Percentile
Absence of metacognitives dysfunctional strategies	14	30%
Cognitive Strategies	7	25%
Metacognitive Strategies	10	55%
TOTAL	31	25%

Table 3. General punctuation analysis scored and from each subscale at the Evaluation of Learning Strategies from Elementary Level Scale (EAVAP-EF).

At the general punctuation at EAVAP-EF, it was possible to verify that the result correspond to percentile 25%, considered as low desirable performance at the use of the learning strategies, considering that this percentage indicates that 70% of the normative population showed a higher performance than the ADHD students. These results indicated that the

students of this study do not resort enough learning strategies at the moment of study.

For the variable absence of metacognitive dysfunctional strategies, in which the percentile presented by the students was 30%, they showed that they resort to learning strategies with lower frequency at the study moment, showing a high rate at the use of dysfunctional metacognitive strategies.

For cognitive strategies, it is noticed at the subscale, percentile 25% indicating that 70% of the normative sample showed a higher performance than the ADHD students, that is, that these students presented cognitive strategies that included items that required strategies considered as simple, for achieving learning, like essays (writing down fully/to copy the material, underline, to ask and answer, repeat and memorize), elaboration (summarize, create analogies), organization (selection ideas, guides/maps) and integration of the information. The cognitive strategies are not employed with frequency by the ADHD students, because, for these individuals, the information entry, presented alterations, which affected the capacity of acquiring up a stimulus, which impairs the contents acquisition (Banaschewski *et al.*, 2006; Capellini, Ferreira, Salgado, Ciasca, 2007; Van der Leij, Morfidi, 2006; Relvas, 2007).

Regarding the metacognitive strategies, it can be observed a percentile 55%, which shows that the ADHD students present difficulty to plan, to monitor and to regulate (reread, revise and ask for help) their own learning. Summarizing, to build diagrams, reread a text, revise what was wrong in the exercise, these tasks are not very much used by these students, due to their own framework presented by the ADHD, as described at the lecture, inattention, hyperactivity-impulsivity and alterations at planning and integration, as well as difficulties with sustained and selective attention, which directly impair their academic life (American Academy of Pediatrics, 2000; American Psychiatric Association [APA], 2000; Barkley, Fischer, Smallish, Fletcher, 2002; Faraone, 2003; Capovilla A., Cozza, Capovilla F., Macedo, 2005; Kessler *et al.*, 2005; Pastura, Mattos, Araújo, 2005; Graeff, Vaz, 2006; Matos *et al.*, 2006; Capovilla A., Assef, Cozza, 2007; Saboya, Saraiva, Palmira, Lima, Coutinho, 2007).

Based on this finding, it becomes obvious and urgent, the necessity of guiding the students with ADHD concerning to the different ways of learning. But, the establishment and the maintenance of the motivation, maintenance of sustained and selective attention and the control of the anxiety are necessary for the efficient use of learning strategies (Boruchovitch, 2001).

This way, the ADHD student can be benefited if he has the opportunity to use the learning strategies early, so, throughout his/her lifelong academic life the repertoire of strategies would be more complex and flexible (Costa, 2000; Costa, Borochovitich, 2004).

Some strategies are used spontaneously by the students without the need of any direct instruction, however, others, even if they are taught, are hardly used (Souza, 2010). As it can be observed in this study, for the ADHD students, the teaching of the strategies could not be limited to only in a specific moment, it becomes necessary a long term professional help, so the student can recall its use. According to Souza (2010), «the most strategic students effectively reach a higher performance at the learning process», what benefits the ADHD students, because the learning strategies are valuable resources that the student can have at the study moment, aiming to optimize the recuperation and immediate utilization of the information, diversifying the way of study and reducing the difficulty that the content to be learned could present, which allows better conditions to learning and academic performance (Costa, Borochovitich, 2004; Oliveira, Santos, 2009).

To know the learning strategies used by the students it is not only important to indicate the level of self regulation from the students, but it is of fundamental importance to the elaboration of intervention with the learning difficulties (Borochovitich, 1999; Souza, 2010), because at the learning difficulties secondary to ADHD, to know how the student uses this learning strategies could help at the academic development, increasing their teaching-learning tasks performance.

Conclusion

The results presented show that ADHD students did not use effectively the learning strategies, like underlining the important parts of the text, summarizing and diagrams, monitoring their own comprehension during reading, inclusive asking for help at the difficult moments and doubts, among others, i.e., the ADHD students did not use in a effective way the cognitive and metacognitive strategies and showed high frequency at the use of dysfunctional metacognitive strategies.

These alterations are in accordance with ADHD, because, the information entry, visual or auditory, is altered, as consequence of inattention,

which impairs learning for these students, so, it is important to help the elaboration of intervention programs that orient the student with ADHD to acquire his/her own means of learning and how to build his/her own knowledge, motivating them, that way, to learn. In this context, the role of the professional, speech therapist, psychologist and specially the teacher in classroom, should be as facilitator agent, in the presentation of the learning strategies to these students, but also encourage them to use and teach how to use these strategies, providing an active participation of the ADHD students for their teaching-learning process as well, in order to improve their academic performance.

Author's Presentation: Simone Aparecida Capellini. Speech and Language therapist. Professor of the Department of Speech, Language and Hearing Therapy and the Graduate Program in Education and Speech, Language and Hearing Therapy – School of Sciences and Philosophy – São Paulo State University “Júlio de Mesquita Filho”- FFC/UNESP/Marília – São Paulo – Brazil.

Adriana Marques de Oliveira. Speech Language Therapist of the Investigation of Learning Disabilities Laboratory (LIDA) of the Speech, Language and Hearing Therapy Department, School of Sciences and Philosophy – São Paulo State University “Júlio de Mesquita Filho”- FFC/UNESP/Marília – São Paulo – Brazil. Master's degree and Doctoral student in Education – School of Sciences and Philosophy – São Paulo State University “Júlio de Mesquita Filho”- FFC/UNESP/Marília – São Paulo – Brazil (FFC/UNESP).

References

- ALMEIDA, L.S. (2002), “Facilitar a aprendizagem: ajudar os alunos a aprender e a pensar”, *Psicologia Escolar e Educacional*, 6 (2), 155-165.
- AMERICAN PSYCHIATRIC ASSOCIATION [APA] (2000), *Diagnostic and statistical manual of mental disorders: DSM-IV-TR*, 4th ed., Washington, DC, American Psychiatric Association.
- BANASCHEWSKI, T., RUPPERT, S., TANNOCK, R., ALBRECHT, B., BECKER, A., UEBEL, H. ET AL. (2006), “Colour perception in ADHD”, *Journal of Child Psychology and Psychiatry*, 47(6), 568-572.
- BARKLEY, R.A., FISCHER, M., SMALLISH, L., FLETCHER, K. (2002), “The persistence of attention-deficit/hyperactivity disorder into young adulthood as a function of reporting source and definition of disorder”, *Journal of Abnormal Psychology*, 111(2), 279-289.
- BORUCHOVITCH, E. (1993), “A psicologia e a metacognição: novas perspectivas para o fracasso escolar brasileiro”, *Tecnologia Educacional*, 22, 22-28.

- (1996), “Algumas estratégias de compreensão em leitura de alunos do ensino fundamental”, *Psicologia Escolar e Educacional*, 5(1), 19-25.
- (1999), “Estratégias de aprendizagem e desempenho escolar: considerações para a prática educacional”, *Psicologia: Reflexão e Crítica*, 12(2), 361-376.
- (2001), “Algumas estratégias de compreensão em leitura de alunos do ensino fundamental”, *Psicologia Escolar e Educacional*, 5(1), 19-25.
- CAPELLINI, S.A., FERREIRA, T.L., SALGADO, C.A., CIASCA, S.M. (2007), “Desempenho de escolares bons leitores, com dislexia e com transtorno do déficit de atenção e hiperatividade em nomeação automática rápida”, *Revista da Sociedade Brasileira de Fonoaudiologia*, 12(2), 114-119.
- CAPOVILLA, A.G.S., ASSEF, E.C.S., COZZA, H.F.P. (2007), “Avaliação neuropsicológica das funções executivas e relação com desatenção e hiperatividade”, *Avaliação Psicológica*, 6(1), 51-60.
- CAPOVILLA, A.G.S., COZZA, H.F.Z., CAPOVILLA, F.C., MACEDO, E.C. (2005), “Funções executivas em crianças e correlação com desatenção e hiperatividade”, *Temas sobre Desenvolvimento*, 14(82), 4-14.
- COSTA, E.R. (2000), “As estratégias de aprendizagem e a ansiedade de alunos do ensino fundamental: Implicações para a prática educacional”, *Dissertação de Mestrado em Educação não-publicada, Curso de Pós-Graduação em Psicologia Educacional*, Universidade Estadual de Campinas. Campinas, SP.
- COSTA, E.R., BORUCHOVITCH, E. (2004), “Compreendendo relações entre estratégias de aprendizagem e a ansiedade de alunos do ensino fundamental de Campinas”, *Psicologia: Reflexão e Crítica*, 17(1), 15-24.
- DEMBO, M.H. (2000), *Motivation and learning strategies for college success: a self-management approach*, Mahwah, New Jersey, Lawrence Erlbaum Associates Publishers.
- (1994), *Applying educational psychology*, 5th ed., New York, Longman Publishing Group.
- FARAONE, S.V. (2003), “Report from the 4th international meeting of the attention deficit hyperactivity disorder molecular genetics network”, *American Journal of Medical Genetics*, 121(1), 55-59.
- GRAEFF, R.L., VAZ, C.E. (2006), “Personalidade de Crianças com Transtorno de Déficit de Atenção e Hiperatividade (TDAH) por Meio do Rorschach”, *Psicologia: Teoria e Pesquisa*, 22(3), 269-276.
- KESSLER, R.C., ADLER, L.A., BARKLEY, R., BIEDERMAN, J., CONNERS, C.K., FARAONE, S.V. ET AL. (2005), “Patterns and predictors of attention-deficit/hyperactivity disorder persistence into adulthood: results from the National Comorbidity Survey Replication”, *Journal of the Society of Biological Psychiatry*, 57 (11), 1442-1451.
- MATTOS, P., PALMINI, A., SALGADO, C.A., SEGENREICH, D., GREVET, E., OLIVEIRA, I.R. ET AL. (2006), “Painel brasileiro de especialistas sobre diagnóstico do transtorno de déficit de atenção/hiperatividade (TDAH) em adultos”, *Revista de Psiquiatria do Rio Grande do Sul*, 28(1), 50-60.
- OLIVEIRA, K.L., BORUCHOVITCH, E. (2009), “Estratégias de aprendizagem e

- desempenho acadêmico: evidências de validade”, *Psicologia: Teoria e Pesquisa*, 25(4), 531-536.
- OLIVEIRA, K.L., BORUCHOVITCH, E., SANTOS, A.A.A. (2010), “Escala de avaliação das estratégias de aprendizagem para o ensino fundamental: EAVAP-EF”, São Paulo, Casa do Psicólogo.
- PASTURA, G.M.C., MATTOS, P., ARAÚJO, A.P.Q.C. (2005), “Desempenho escolar e transtorno do déficit de atenção e hiperatividade”, *Revista de Psiquiatria Clínica*, 32(6), 324-329.
- RELVAS, M.P. (2007), *Neurociência e transtornos de aprendizagem*, Rio de Janeiro.
- SABOYA, E., SARAIVA, D., PALMINI, A., LIMA, P., COUTINHO, G. (2007), “Disfunção executiva como uma medida de funcionalidade em adultos com TDAH”, *Jornal Brasileiro de Psiquiatria*, 56(Supl 1), 30-33.
- SOUZA, L.F.N.I. (2010), “Estratégias de aprendizagem e fatores motivacionais relacionados”, *Educar em Revista*, 36, 95-107.
- VALDÉS, M.T.M. (2003), “Estrategias de aprendizaje: bases para la intervención psicopedagógica”, *Revista de Psicopedagogía*, 20 (62), 136-142.
- VAN DER LEIJ, A., MORFIDI, E. (2006), “Core deficits and variable differences in Dutch poor readers learning English”, *Journal of Learning Disabilities*, 39(1), 74-90.