

Attention in physical education classes: Differences between different individual modalities

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ABSTRACT

Introduction: Sport activities demand a focused and polarized attention, as necessary condition to learning process. Described as an essential condition to the learning process, attention is considered a powerful mediating variable, because we can notice its influence on the teaching-learning process, as well as its influence on the teacher's behaviour, the student's behaviour and the learning results. According to this fact, the focused attention arises as a fundamental condition to the learning process, since the greater the power to keep the focus on a certain object or task, the better the chance of success. Objective: We intend to know the aspects to which the students pay attention during the different moments of the Physical Education class, in individual sportive activities. Methodology: The sample consisted of 156 students from the 3rd Cycle of Basic Education, of both genders (84 female and 72 male). We applied the questionnaire ATEST-EF (Petrica 2003), in which the students signalized what they were thinking of at certain moments of the Physical Education classes, more precisely of Athletics and Gymnastics classes. The results indicate that there are no significant differences, because after the application of the test of "Chi-Square" to associate the variable "Attention" and the variable "Signal" for the individual activities, we can verify the value of ($p = .373$). From the analysis performed, we can infer that in relation to students' attention profile study in individual sports,

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athletics and gymnastics, there are no statistically significant differences. **Key words:** Physical education; Moments in class; Student's thought; Individual sport activities; Attention.

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INTRODUCTION

Santos, Petrica, Maia & Batista (2016), emphasize the importance of the analysis of the act of teaching and mainly on the field of the student's thinking, in particular the factors that hold their attention in class. The attention of students, considered by the research as a powerful mediator variable, is notorious for its influence on the teaching-learning process, as well as highlights the mutual influence between teacher and student behaviour's and learning outcomes (Santos, 2009). Learning any motor skill requires the selection of information that may be contained in the environment and / or provided by the teacher or technician. For this information to be retained, for further interpretation and possible storage in long-term memory, the attention process is fundamental. From this assumption, focused attention emerges as a fundamental condition for learning, because the greater the power to maintain focus on a given object or task, the greater the chances of success. We will direct our attention to the fact that athletes in general, and young people who are developing their learning of a specific sport, are strongly influenced by their attentional styles. This work is about the need and interest to study the relationship between the levels of attention of students and their influence on school success and to identify if there are differences between the different moments of the class when teaching of individual sports, namely the Gymnastics and Athletics. Through this study, we will try to answer the increasingly frequent doubts of parents about the positive or negative effects that regular sports practice will eventually have on the learning pace and on the motivations of adolescents in school praxis. This study aims to detect the existence (or absence) of "significant" factors that distinguish attention in the discipline of Physical Education and its relationship with the different sports taught in Physical Education.

Attention

The research on teaching was centred until almost a few years ago, almost exclusively, on the analysis of the behaviour of the teacher, ignoring the preponderant role that the student had in his learning process. Currently, some studies have emphasized the active role of students in this process (Sicilia, Moreno & Rojas, 2008; Wang, 2015).

The student's attention has been considered one of the variables of the cognitive processes that most influences the respective learning. According to Wittrock (1986) the attention is related to a great or less learning capacity of the students. Attention has been one of the variables or constructs most studied in the field of human neurosciences (James, 1890; Posner & Petersen, 1990). In a general level, attention could be given to the ability to direct cognitive resources that allow the body to be prepare for action, based on the operationalization of the demands needed at a given moment. It would cover all human behaviour's, from the most conscious, such as writing an article, studying, painting a door paying attention to its details, preparing a meal, etc; to the most unconscious, such as eating the meal (what he eats first, how he organizes his meal on the plate, etc.), (Fehmi & Fritz, 1980). Although attention is an already well-researched subject in the field of pedagogy and psychology, it seems to us very important to approach its concept as well as the influence it has on learning. In the studies carried out among us, we highlight some such as Pereira (1995) and Pereira, Carreiro da Costa and Alves Diniz (2000), which were based on the categorization systems created by Locke & Jensen (1974) and the student's Action in Physical Education, and answer the following question: "Will the student's thought processes influence their behaviour in Physical Education classes?" The most relevant conclusions of this study were as follows: when students were questioned about their thoughts, their attention was mostly centred on the tasks of the class (63.3%); the students revealed higher levels of attention in the practical situations of the class than in the situations of instruction by the teacher. Petrica, Pacheco and Velez, (2000) who also studied the attention in the Physical Education classes, trying to know the attention of the students of the 5th and 6th grades, and if there were differences in the levels of attention between

them, and concluded that the students presented levels of attention quite acceptable, both the tasks proposals and those carried out; there are no significant differences in the students, in any period of the class, regarding the level of attention.

It is also worth noting that Santos (2009) studied the profiles of attention in the different moments of the physical education class, comparing these profiles among students with different school incomes, and concluded that in Physical Education classes, the students are substantially concerned about what they are doing, about what they are going to do, or about what they have done, though much less are they also paying attention to the information provided by the teacher or his colleagues, Sometimes thinking about what your teacher and your colleagues are doing, representing affective thinking, thinking outside the task, and thinking about other things, represents a much smaller part of your attention. It has been of great interest that the study of attention and even specifically what is considered an attentional profile can contribute to the learning, training and consolidation of performances in varied sports modalities in educational context (Petrica 2003; Petrica, 2010). The differences of interest, attitude and aptitude among students of the same class in relation to the different specialties of Physical Education are well known. Teachers quickly become aware of these differences, which appear to be related to students' skill levels and attention. The relation between thought and action is of crucial importance, insofar as the teaching - learning process is characterized as an eminently human activity. The theory holds that cognition is the key for action, and therefore the student is seen as an active individual in the process of building knowledge itself (Lee & Solmon, 1992; Nejati & Nejati, 2012). Several studies (Santos, Petrica, Serrano & Mesquita, 2014; Santos, Petrica & Maia, 2015; Santos, Petrica, Maia & Batista, 2016) about student thinking have been carried out, under the cognitive processes and student behaviour in learning situations, and not only how students interpret the pedagogical stimuli transmitted by the teacher. Some factors, such as the personal characteristics of students, their perceptions about school, content to learn, and many others, are variables through which students perceive the events that occur in the classroom.

This perspective is reinforced by Witrock (1996, p.56), "Perceptions, expectations, attention, motivations, attributions, memory, understandings, beliefs, attitudes, learning strategies and metacognitive processes have been some of the privileged topics within the scope of studies on the student's thinking processes".

Carreiro da Costa (2000) presents some topics through which we can investigate how the student's thinking can be analysed: a) students' personal perceptions of Physical Education: What is Physical Education, what students want to achieve, self-criticism of achievement of the exercise, satisfaction during class, and the influence of these variables on student participation in class; b) perceptions about the behaviour of the teacher: What is a good teacher for the students, what is the behaviour of the teacher during the classes; c) cognitive processes of students during the teaching-learning process: What students think during class, level of cognitive involvement during learning, information understood and retained during classes. In addition to the different types of attention applied to the different sports, we have studied this phenomenon in children in their passage to the age of puberty, between 10 and 15 years, particularly in the process of teaching and learning during the physical education classes (Santos, Petrica, Serrano & Mesquita, 2014, Santos, Petrica & Maia, 2015; Santos, Petrica, Maia & Batista, 2016). Sánchez-López, Silva-Pereyra and Fernandez (2016) also argue that focused attention is essential for sports with open competences, such as team sports. Also, Januário, Rosado and Mesquita (2011) verified that the levels of retention of the transmitted information were lower in relation to higher levels of motivation of the athletes. The same authors found that higher levels of attention implied higher levels of information retention. More recently, Januário (2014) states that attention should be paid during the instruction process to teachers and coaches as one of the main aspects, which

should seek the implementation of strategies that enhance the attention of students and athletes to the information transmitted, seeking to reduce activities and distractive situations.

The processes mentioned above establish an intimate and complex inter-relationship about what will influence student behaviour, achievement and learning. According to this, we consider that it is our best interest to complement the field of investigation of students' attention in Physical Education classes, so that we can: know what students are thinking about in Physical Education; understand if there is a thinking pattern in the Physical Education classes; to know theoretical and practical indicators about what students think in different individual sports; and to design eventual recommendations for a better articulation between the attention and the approach of the individual sports in the Physical Education class.

MATERIALS AND METHODOLOGY

Objective

We intend to know what students think about individual sports, that is, what aspects they pay attention, so that this knowledge can be used to help and contribute for this descriptive study of the teaching process.

Instruments

To collect data, we used the ATEST-EF questionnaire (Petrica, 2010) with which we intend to know what the students were thinking about during Physical Education classes.

Participants

Our participants were all the students that attend the 3rd cycle of Basic Education, but, it does not seem pertinent to develop a study that represents the population, and because we intend to carry out a prospective research, we thought we could do it through a case study. A total of 156 students of both genders (84 females and 72 males), aged between 12 and 16 years old, were selected from all the students of the 3rd cycle of Basic Education, from a school in Sertã, Portugal, with an average of 14.9 years to which a questionnaire was applied in which students would have to indicate what they were thinking about certain moments of the Physical Education class and it was applied during the practice of individual sports, in Athletics and Gymnastics.

Procedures

In order to study attention, we applied the procedures already adopted by several authors (Locke & Jensen, 1974; Lee, Landin & Carter, 1992, Petrica, 2003; Santos, 2009) for the objectives that we intend to achieve with our research, in which teaching have been analysed from a cognitive perspective, which allowed to enrich the knowledge and open a new field of research, in relation to the processes mediators of the thought, and provided elements on the knowledge of the students, emphasizing their contextualized character and the interactive role of their experiences.

As our objective was to know what were students think during classes, soon we needed to understand what aspects students were paying attentive, we decided to use a questionnaire, in addition to transmitting us information about the students' thinking, was at the same time easy to fulfil, objective, simple and containing all possibilities of response. We wanted the attention of the students to be recorded in questionnaires distributed and explained to the students at the beginning of the class, and to a sound signal, previously known, register their option to a range of possible answers to the question. What were you thinking at the moment you heard the signal?

In this level of education, facts such as psychological nature were decisive because these students already had a great capacity for verbalization and written expression of their thoughts and attitudes, since it seems interesting to analyse students who reveal a capacity for discernment and expression of thought processes properly.

Statistical Procedures

After applying the instrument, we to statistical procedures, using descriptive and inferential statistics through the application of Chi-Square. Statistical significance was considered for values of $p \leq 0.05$, for a probability of error of 5% (usual in studies of this nature). We used the SPSS 21.0 program (Statistical Package for Social Sciences).

RESULTS

From the response frequencies obtained for each of the items, by combining the interrogation moments, we elaborated Table 1, which shows the frequencies by item, the percentage of occurrence for each of the items and the cumulative percentage for the variables to which these items belong.

Table 1. Frequency of students' answers in the ATEST-EF application

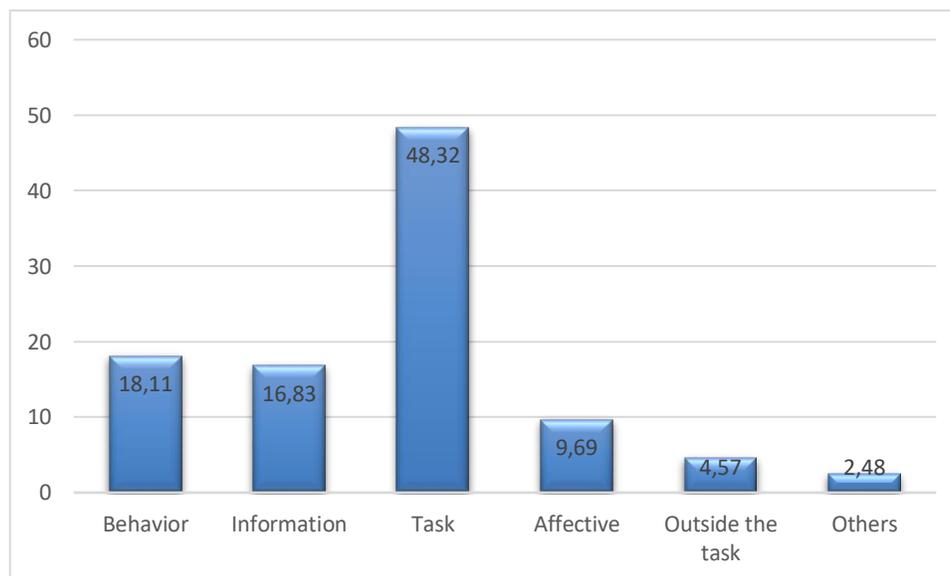
Variable	Sub-variable	What were you thinking at the moment you heard the signal?	Individuals		
			N	%	%
Attention behaviour	to Teacher	What was the teacher doing	133	10.7	
	Colleagues	What was the colleague doing	93	7.5	18.2
Attention information	to Listening	What the teacher saying	139	11.1	
	Relate	What was the colleague saying	71	5.7	16.8
Attention to the task	For realization	What am I going to do	185	14.8	
	In realization	What am I doing	295	23.6	48.3
	Realized	What have I done	123	9.9	
Affective attention	Colleagues	In my colleague	51	4.1	
	Teachers	In my teacher	47	3.8	
	Friends	In my friends	17	1.4	9.8
	Family	In my family	6	.5	
Attention outside the task	In class	What have my colleague done to me	20	1.6	
		What am I going to do to my colleague	13	1.0	
	Outside the class	What am I going to do on my break	17	1.4	4.6
		In a computer /mobile phone game	7	.6	
Attention on other thinks	Others	Another thing	31	2.5	2.5

From the analysis in table 1, students in Physical Education class say they are thinking (attentive), in descending order: what they are doing (23.6%), followed by what I am going to do (14.8%) , in what the teacher was saying (11.1%), what the teacher was doing (10.7%), what I did (9.9%), what I was doing with my colleague (7, 5%), my colleague said (5.7%), my colleague (4.1%), my teacher (3.8%), what my colleague did to me (1.6%), (1%) In a computer / mobile phone game (0.6%) and in my family (0.5%), in what I am going to do to my colleague (1%).

This indicates that the higher frequency of answers refers to the attention to the task they are doing, followed by the attention to the task to be done, attention to the teacher's information, attention to the teacher's behaviour, the task performed, the information of colleagues, to the affective attention of the classmates and teacher, and the lower frequency of answers corresponds to aspects outside the class, whether they are affective or related to aspects that are not related to the class.

The combination of the percentage values of the items for each subcategory, in the respective ones, by an accumulated percentage calculation, allowed to know the relative percentage of each one of the main categories defined for this instrument, which makes possible, like the procedures adopted for the profile of the behaviour of the teacher (Pierón, 1969, Petrica 2003, 2010, Rosado et al, 1997), the elaboration of a graphical representation, by means of a vertical bar chart, on the percentage values of its main categories, which we call the student's attention profile (Graphic 1).

We will present the results obtained, starting with a more descriptive exploration, seeking to find profiles of attention, which characterize the students of our study, with a comparative analysis, depending on the individual sport.

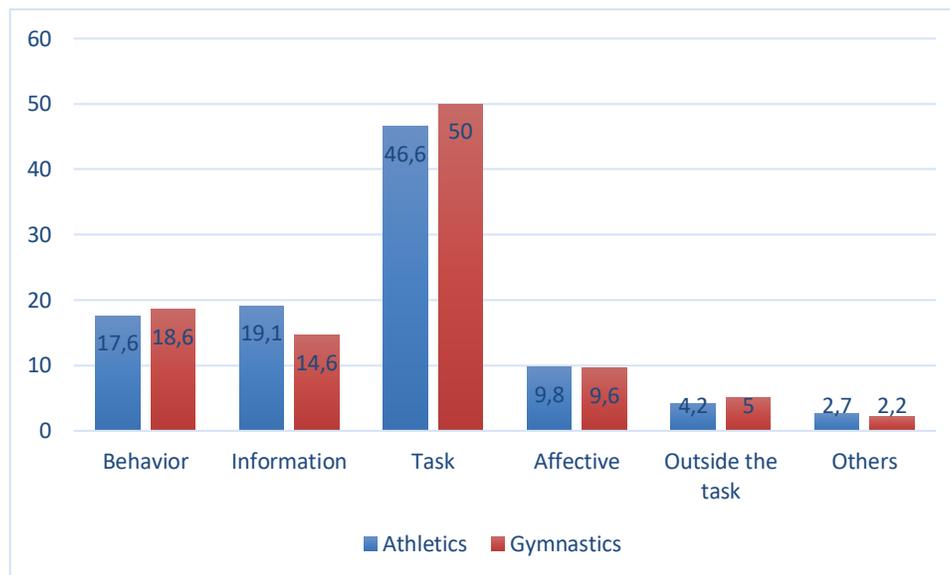


Graphic 1. General profile of the Attention of the students in the individual sports

The graphic observation allows us to verify that the category that represents the largest percentage dimension is the one that refers to the task (49.7%), followed by the attention to information (20.8%), which represents a (20.2), a little lower than the previous one, and already with considerably lower values follows the affective attention (5.3%), attention outside the task (2.4%) and attention in others (1.7%). It is also necessary to analyse the data, shown in figure 2, obtained in each of the individual sports, Athletics and Gymnastics.

Analysing graphic 2, we find that the categories that present the greatest variation during the Physical Education classes are attention to the task, followed by attention to behaviour, attention outside the task and attention in others. As far as attention to information is concerned, it does not vary much during the lessons. According to this, we verified that although we believed of the existence of differences in the attention of the students with different sports, in Physical Education classes, after applying the statistical tests, we verified

the absence of statistically significant differences. There are significant differences in the thought processes (attention) of the students in the Physical Education class in the teaching of individual sports.



Graphic 2. Comparison between parts of the class in individual sports

DISCUSSION

These results are relatively consistent and support the theory of mediating processes, confirming the importance of considering students' personal perceptions as psychological traits, anticipating their behaviour in teaching-learning situations and, by extension, academic performance. The reflection on these variables can help the teacher to adapt the strategies and behaviour's, aiming to neutralize the factors that induce attitudes and feelings harmful to teaching-learning and, mainly, to positivize those that favour student learning, either by raising awareness about their own abilities and limitations, either by adapting the teaching strategies and interventions to the personal characteristics diagnosed in the students. From the results of the application of the questionnaire and the analysis, we think we could define types of students in relation to what they say they pay attention in classes of Physical Education.

These data allowed us to elaborate a profile of attention in Physical Education classes, in the individual sports, from which we could verify that the category that represents the greatest values is the attention to the task, which represents a large part of the total attention of the students, the following is the attention to the behaviour which is followed very closely by the attention to information, immediately follows the affective attention, and finally and already with considerably smaller values arises the attention outside the task and attention to other things.

However, these results are relatively consistent with the study of Petrica (2003) and Santos (2009) and support the theory of mediating processes, confirming the importance of considering the student's personal perceptions as psychological traits, in anticipation of their behaviour in situations teaching-learning and, by extension, academic performance.

The reflection on these variables can help the teacher to adapt the strategies and behaviour's, aiming to neutralize the factors that induce attitudes and feelings harmful to teaching-learning and, mainly, to positivize

those that favour student learning, either by raising awareness on their own abilities and limitations, either by adapting the teaching strategies and interventions to the personal characteristics diagnosed in the students. The evaluation of the results obtained for each of the groups under analysis did not show any major differences, and although we were convinced of the existence of differences in relation to attention in the Physical Education class, in individual sports, after applying the statistical tests regarding attention, we verified the absence of statistically significant differences ($p = 0.373$).

CONCLUSIONS

According to what we have established as main objectives, of knowing what the students think, in Physical Education classes, these results allowed us to conclude that, in Physical Education classes, in individual sports, students are substantially concerned about what they are doing, what they are going to do, or what they have done, though much less, they are also paying attention to the information provided by the teacher or his colleagues and are sometimes your teacher and your colleagues are doing, representing affective thinking, thinking out of task and thinking in other things, a much smaller part of your attention. It was not possible to confirm this perspective of analysis, since it was not possible to confirm this perspective of the students, in order to know if students in different sport are paying attention to different aspects of Physical Education class, and that attention levels do not vary according to the individual sport practiced. However, these data allowed us to elaborate a profile of students' attention in Physical Education classes, in individual sports from which we could verify that the category that represents the greatest values is the attention to the task, which represents a great part of the total attention of the students, the following is the attention to the behaviour which is followed very closely by the attention to the information, comes immediately after the affective attention, finally and already with values considerably smaller attention comes the attention out of the task and attention to other things. In this study, we did not find statistically significant differences but we found interesting results that could be addressed in future studies. We believe that schools and teachers will play an even more important role if they value these and other similar data and include them in their teaching practices, meeting the expectations of the students. We also believe that Physical Education teachers are the agents who are best placed to introduce changes and stimulate a process of change leading to an increase in sports practice, a reduction in physical inactivity and, consequently, significant improvements in general health and performance conditions of adolescents.

REFERENCES

- Carreiro da Costa F. (2000) "A atenção dos alunos em aulas de Educação Física", Boletim da Sociedade Portuguesa de Educação Física, 2000, nº 19-20, p.84.
- Clark, C. M., & Peterson, P. (1986). Teachers' thought processes. In M. Wittrock (Ed.), Handbook of research on teaching (3^a ed., pp. 255-296). New York: Macmillan Publishing Company.
- Correia, C. (1985). Perfil dos comportamentos do professor de educação física em classes com taxas de empenhamento motor fracas (Dissertação de mestrado não publicada). Universidade Técnica de Lisboa, Portugal.
- Fehmi, L.G. & Fritz, G. (1980). Open Focus: The Attentional Foundation of Health and Well-Being, Somatics, Spring 1980, 24-30.
- James, W. (1890). The principles of psychology (H. Holt, New York, NY).
- Januário, N., Rosado, A., & Mesquita, I. (2011). Determinants of Feedback Retention in Football players [Abstract]. Book of Abstracts of the 7th World Congress on Science & Football. Nagoya, Japan, 172.
- Januário, N (2014) - Determinantes da retenção da informação no ensino de tarefas desportivas. Tese de Doutoramento. Universidade de Lisboa. Faculdade de Motricidade Humana.

- Lee, A., Landin, D., & Carter, J. (1992). Student thoughts during tennis instruction. *Journal of Teaching in Physical Education*, 11(3), 256-257. <https://doi.org/10.1123/jtpe.11.3.256>
- Lee, A. M., & Solmon, M. A. (1992). Cognitive conceptions of teaching and learning motor skills. *Quest*, Champaign, 44, 57-71. <https://doi.org/10.1080/00336297.1992.10484041>
- Nejati, M. & Nejati, V. (2012). Frontal Lobe Function in Chess Players. *Acta Medica Iranica*, 50 (5): 311-314.
- Pereira, P. (1995). O pensamento e a acção do aluno em educação física (Dissertação de mestrado não publicada). Universidade Técnica de Lisboa, Portugal.
- Petrica, J., Pacheco, B., & Velez, J. (2000). A atenção nas aulas de educação física: Diferenças entre o nível de atenção dos alunos do 5º e 6º ano nas aulas de educação física. *Revista do Departamento de Educação Física e Artística*, 2, 37-47.
- Petrica, J. (2003). A formação de professores de Educação Física: Análise da dimensão visível e invisível do ensino em função de modelos distintos de preparação para a prática. Dissertação de Doutoramento, Não publicada, UTAD, Vila Real, 2003.
- Petrica, J. (2010). ATEST-EF: Una herramienta para estudiar la atención de los alumnos en la clase de educación física. In *Actas do III Congreso Internacional de Ciencias del Deporte y Educación Física* (pp. 675-694). Alcoy (Alicante): Editora Alto Rendimiento.
- Piéron, M. (1969). *Dicionário de psicologia*. Porto Alegre: Editora Globo.
- Posner, M.I. & Petersen, S.E. (1990) The attention system of the human brain. *Annual Review of Neuroscience* 13: 25-42. <https://doi.org/10.1146/annurev.ne.13.030190.000325>
- Sánchez-López, J., Silva-Pereyra, J. & Fernandez, T. (2016). Sustained attention in skilled and novice martial arts athletes: a study of event-related potentials and current sources. *PeerJ*. 2016; 4: e1614. Published online 2016 Jan 26. <https://doi.org/10.7717/peerj.1614>
- Santos, J. (2009). A atenção e o rendimento escolar em Educação Física. Dissertação de Mestrado, não publicada, Universidade do Minho, Braga, Portugal. <http://hdl.handle.net/10400.11/4229>
- Santos, J., & Petrica, J. (2013). The relationship between school performance and the attention of students in physical education. *Atención Primaria*, 45, 119-120.
- Santos, J.M., Petrica, J., Serrano, J. & Mesquita, H. (2014) – O perfil de atenção dos alunos nas aulas de educação física: diferenças entre os distintos momentos da aula na leccionação de modalidades desportivas diferenciadas. *Revista Internacional de Deportes Colectivos*, Nº 19, p. 105-118.
- Santos, J., Petrica, J. & Maia, L. (2015). O perfil de atenção dos alunos nas aulas de educação física: diferenças entre os distintos momentos da aula na leccionação de modalidades desportivas individuais. *E-balonmano.com: Revista de Ciencias del Deporte*, 11(1): 103-104.
- Santos, J, Petrica, J., Maia, L. & Batista, M. (2016) The profile attention of students in physical education classes: differences between the different sports. *Atención Primaria. Parallel Sessions: Oral Communications*, 3rd World Congress of Health Research Viseu – Portugal, 29-30 September 2016; 48(Espec Cong 1):25-120. p. 79.
- Sicilia, A., Moreno, J.A. & Rojas, A.J. (2008). Motivational profiles and flow in physical education lessons. *Perceptual and Motor Skills*, 106, 473-494. <https://doi.org/10.2466/pms.106.2.473-494>
- Wang, W. (2015). Factors Affecting Learners' Attention to Teacher Talk in Nine ESL Classrooms. *The Electronic Journal for English as a Second Language*. May 19 (1): 1-20.
- Wittrock, M. (1986). Student's thought processes. In M. Wittrock (Ed.), *Handbook of research on teaching* (3rded). New York: Macmillan Publishing Company.

