



Formative assessment in Physical Education and its relation to the level of attention of primary school children

Pedro José Carrillo-López^a, Rubén Maneiro-Dios^b,
José Enrique Moral-García^c

^a Government of the Canary Islands, Department of Education, Fuerteventura, Spain

^b Pontifical University of Salamanca, Salamanca, Spain

^c University of Sevilla, Sevilla, Spain

Introduction. The aim of this study was to analyse the relationship between primary school students' perception of the Physical Education teacher's formative assessment practices in terms of their level of attention. *Methods.* In this descriptive cross-sectional study that included 172 students, attention was assessed through the Perception of Similarities and Differences test and the teacher's formative assessment practices through the teacher performance questionnaire associated with formative assessment practices whose scores were validated. *Results.* With regard to gender, Student's *t*-test showed no significant differences except for the number of errors in favour of males ($p < .05$). In relation to the level of attention, we detected statistically significant differences in metacognitive ($p < .05$) and retrospective ($p < .05$) formative assessment in favour of those with a lower level of attention. However, the linear regression test showed a negative association between attention and metacognitive formative assessment ($R^2 = .28$). *Conclusion.* It can be concluded that a lower level of attention seems to be associated with a higher perception of primary school students of metacognitive assessment practice associated with internal information processing and with retroactive assessment practice, which is related to the anticipation of learning difficulties. Being aware of the importance of formative assessment in the teaching-learning process, it would be advisable to involve the whole educational community in order to arouse interest among teachers, as it provides essential knowledge in their professional work, contributing to the improvement of academic development as well as to the comprehensive training of all schoolchildren.

Keywords: attention, formative assessment, schoolchildren, Physical Education, education

* Correspondence: Pedro José Carrillo-López, pcarlop@canariaseducacion.es

Introduction

Evaluation has historically been understood as an ideal instrument of selection and control (Guzmán-Simón et al., 2020). Initially, it was used to try to implement forms of individual control and its extension to forms of social control. In the beginning, it appeared as an activity and technique called the exam, which aimed to assess the knowledge possessed by students after a given teaching (López-Lozano et al., 2018; Rosales, 2014).

Later, in the 20th century, educational assessment was born and developed under the protection of Experimental Psychology. It is conceived as a systematic activity integrated within the educational process with the purpose to optimise it. It aims to provide maximum information to improve this process, readjusting objectives, critically reviewing plans, programmes, methods and resources, and providing maximum help and guidance to students (Talanquer, 2015). Therefore, educational assessments should be accompanied by a school purpose that emphasises the development of human capabilities rather than sorting and selecting (Hortigüela-Alcalá et al., 2016). Making good assessments based on quality feedback, can enhance the teaching/learning process, resulting not only in an increase in grades but also in lasting learning for students (Azpilicueta Amorín, 2020).

Depending on the content to be assessed, different types of assessment can be used (depending on the technique, reference, fields of application or the subject being assessed). The main purpose of assessment from a holistic viewpoint is to improve students' learning and make them participants in their own assessment process through different techniques developed throughout the literature review. For this reason, there is no ideal type of evaluation, but rather, depending on the moment and the agent, one type or another should be used (Soria et al., 2022).

However, among the existing different types of assessment, formative assessment has been identified as the most suitable to be carried out within the teaching and learning processes with the purpose of opening up processes of reflection on them and overcoming and/or avoiding them; learning to be competent in life. To this end, assessment instruments that are coherent with the system itself and integrated into the teaching and learning processes should be used (Herranz & López, 2017). The main characteristics of these formative assessment proposals are (1) that they are at the service of those being trained and of educational practice; (2) that they are democratic, as they require the participation of all subjects who are affected by the educational event; (3) that they train, motivate and guide the learning process; and (4) that they are transparent and guarantee knowledge of the criteria used (Córdoba Jiménez et al., 2018).

Recently, Physical Education (PE) teachers have been identified as using formative assessment systems given the motor nature of the area (Carrillo-

López & Hortigüela-Alcalá, 2022). I.e., in a certain sense, the use of summative assessment aimed at the motor area brings with it a certain incoherence, since one of the hallmarks of a formative assessment model is self-regulation during the development of the teaching and learning process (Carrillo-López, 2022). Moreover, in the motor area, it is more coherent to observe how each student usually behaves than to try to find out what they are capable of doing in a motor test at the end of the process (López-Pastor et al., 2020).

In this sense, PE teachers consider that the fundamental advantage of formative assessment is that students become aware and improve their learning process (Molina Soria et al., 2020). Specifically, in a case study, Córdoba Jiménez et al. (2018) indicate how teachers move from a summative and qualitative assessment model, the result of their experience as students and their initial training, to a model based on formative assessment and reflective practice. This model of assessment, at the service of student learning and its consequences in society, is presented as a new challenge consistent with 21st century education. Once the challenge of offering education for all at the end of the 20th century has been overcome, strategies must be implemented to offer quality education for all, and more specifically to ensure that Spanish pupils are on a par with the European average in the face of a future that looks very competitive.

Likewise, the results of the study provided by González et al. (2021) indicate that there is a transfer between the assessment experiences lived during the initial training of PE teachers and the application of these assessment systems in their first years of work. However, on other occasions, the implementation of these assessment systems is the result of the experience acquired in the in-service training carried out by teachers.

Based on these characteristics, it is clear that formative assessment is at least a two-way affair: the sender and the receiver. However, it is prescriptive to point out that when it is learning that is being assessed, the feedback to the learner from the analysis of the results does not always guarantee the modification of their learning process as it requires the cognitive processes that regulate this information processing (Kluger & DeNisi, 1996; Kulhavi, 1977; Janković-Nikolić, 2020).

One of the main cognitive functions that has aroused great interest among scientists, educators and sports coaches has been the analysis of attention, as it is directly related to mechanisms such as perception, memory, executive functioning and processes such as learning (Rosa-Guillamón et al., 2019). Attention has been defined as the ability to generate, direct and maintain an adequate state of activation for correct information processing (Rueda et al., 2015). It has been described that there is a large number of students diagnosed with Attention Deficit Hyperactivity Disorder or many “absent-minded” students in classrooms (Gamo, 2017). In this line of argument, it is worth asking: *what type of formative assessment do students perceive according to their attentional*

capacity, and will those who are more attentive perceive greater formative assessment from the teacher?

Based on these precedents, the main objective of this study was to analyse the relationship between the student's perceptions of the formative assessment practices of Physical Education teachers according to their level of attention. This main objective was broken down into four secondary objectives:

- I. To assess the students' perceptions of the formative assessment practices of Physical Education teachers and their level of attention, taking into account gender (*male vs. female*).
- II. To analyse the relationship between the students' perceptions of the formative assessment practices of the Physical Education teacher and the different types of attention (*Inhibitory control, Attentional efficiency, and Global Attention Index*).
- III. To determine the relationship between the students' perceptions of the formative assessment practices of the Physical Education teacher according to their level of attention (*higher vs. lower*).
- IV. To establish the predictive value of the formative assessment practices of the Physical Education teacher on the level of students' attention.

Methods

Participants

A total of 172 schoolchildren (93 boys and 79 girls) belonging to the Autonomous Community of the Canary Islands (South of Tenerife), aged 10-13 years ($M \pm SD = 11.40 \pm 1.68$ years) participated in this empirical descriptive and cross-sectional *ex post facto* study. Sampling was non-probabilistic, chosen non-randomly and by convenience. A public school was selected in the district of Arona. This centre had a medium socioeconomic level. In previous meetings with the school representative, she was informed of the study protocol, and informed consent was requested from the parents or legal guardians so that the schoolchildren could participate. Inclusion criteria were 10–12 years of age and regular school attendance (90% of classes during the months of the current academic year). Exclusion criteria included not meeting any of the aforementioned inclusion criteria, incorrect or incomplete completion of any of the tests, having a medical contraindication that prevented normal activity practice, or being in the process of dietary or food restriction.

Variables and instruments

Criterion variable

The questionnaire: teaching performance associated with formative assessment practices (Cerón Urzua et al., 2020) was used to assess the student's perception of the teacher's formative assessment practices. This instrument is composed of 21 items grouped into six sub-scales. Each sub-scale refers to formative assessment associated with grading (summative) (items 1-3), proactive formative assessment (items 4-6), interactive formative assessment (items 7-10), metacognitive formative assessment (items 11-14), retroactive formative assessment (items 15-18) and adjusted formative assessment (items 19-21). The overall scale score is obtained from the average score obtained for each subscale. The higher the score, the higher the teacher's level of formative assessment practices from students' perspective. The response alternatives were given through a Likert-type scale with: 1 = Never, 2 = Rarely, 3 = Occasionally, 4 = Frequently, and 5 = Very Frequently. The estimated response time was between 10 to 15 minutes. The psychometric analyses carried out on this formative assessment questionnaire at classroom level corroborated the degree of reliability of this instrument, which obtained per se scores making this questionnaire a valid (RMR = .04; RMSEA = 0.041) and reliable instrument ($\alpha = .93$).

Specifically, in this research, internal consistency indices (Cronbach's α) of .88 (summative), .79 (proactive), .84 (interactive), .89 (metacognitive), .91 (retrospective) and .89 (adjusted) were obtained in the following dimensions, which are considered adequate (Cumming & Calin-Jageman, 2016), as has been done in another study (Carrillo-López & Hortigüela-Alcalá, 2022).

Predictor variable

Students' Selective attention was estimated using the thirteenth version of Thurstone & Yela's (2019) Test of Perception of Similarities and Differences (Faces-R). This test measures the ability to perceive, with the highest processing speed, similarities, differences, and partially ordered stimulus patterns. It is used for subjects aged six to 18 years. It consists of 60 graphic items, each comprising three schematic drawings of faces with the mouth, eyebrows and hair represented with elementary strokes. In each set of three faces, two are the same, and the task is to determine which is different and cross it out.

This test has been widely used in education to assess perceptual and attentional aspects in schoolchildren with and without attention and hyperactivity problems (Rosa-Guillamón et al., 2019). The strategies adopted to discriminate between the different items are inhibited when performing the test. When the subject finds a different face, they must cross it out and continue with the rest of the sets. There is no order in which to complete the test. The subject has a total time of three minutes. The score is obtained directly from the total number of correct answers, the maximum score being 60 points.

Test-retest reliability studies conducted by Crespo-Eguílaz et al. (2006) with individuals aged six years and older showed a reliability coefficient of .95. Taking these aspects into account, the following variables were considered in this study: (1) hits (A): total number of correct responses; (2) errors (E): number of incorrect responses; (3) omissions (O): figures not indicated in the task; (4) Inhibitory Control (IC): ratio of the difference between correct and incorrect responses, divided by the sum of correct and incorrect $\times 100$ $((A - E / A + E) \times 100)$; (5) Attentional efficiency (AE): the number of correct answers divided by the number of correct answers plus errors plus omissions $\times 100$ $((A / A + E + O) \times 100)$.

In addition, based on the indicative criteria of the CARAS-R test (Thurstone & Yela, 2019), the enneatypes were calculated and understood as a global index of attention. The enneatypes were also classified into: *lower v. higher attention*. Taking into account that the enneatypes are a typical scale whose mean is five and standard deviation is two, scores between enneatypes three and seven would reflect performance within the normal range. In this sense, the variable (6) level of attention was created: *lower attention*: (enneatypes; ≤ 4 points) and *higher attention* (enneatypes; ≥ 5 points).

Procedure

This study was carried out at the end of the academic year 2020/2021. School heads and representatives of parents' associations were informed of the purpose and protocol of the research at a meeting in September. The working team consisted of a principal researcher (PhD in Education with special mention in Physical Education and physical education teacher) and two collaborating doctors. A theoretical session was held with each study group in order for the participants to understand the test questionnaire. The principal researcher administered the test in the natural class groups following the given protocol, i.e., prior to the completion of the test, the questionnaire was explained again and all doubts were resolved so that all students understood all items perfectly. All questionnaires were administered during the first three school sessions in order to avoid the possible fatigue of the school day and to interrupt the school dynamics as little as possible.

The teacher's training to apply formative assessment was at an advanced level in research, innovation, evaluation and quality of educational and/or training centres, people, institutions, services, and organisations, both in formal and non-formal contexts. In this sense, in order to obtain more precise data, a formative assessment was carried out during the course of the school year, which implies understanding that the students have a full academic year to develop the learning of the assessment criteria. In this way, up-to-date and valuable information is obtained on the students' level of achievement, as it enables learning difficulties to be detected and redirected, and the teaching process to be improved.

It should be noted that formative assessment was carried out in all its dimensions by the teacher who taught Physical Education throughout the course. The students answered the questionnaires with this particular teacher in mind. That is, proactive

formative assessment (e.g., before working on an activity, written instructions were given with what was to be achieved in the task); interactive (e.g., when working on an activity, the teacher reviewed the work for immediate feedback); metacognitive (e.g., when formatively assessing by means of a formative assessment, the teacher gave the students feedback); and metacognitive (e.g., when formatively assessing by means of a formative assessment, the teacher gave the students feedback on their work). When students were evaluated formatively through open-ended questions or problem-solving, they were given the reason or the reason for the answer); retroactive (e.g., when answering incorrectly, the teacher helped them to find the correct answer through other questions that guided them to the solution); and finally, adjusted and associated with the grade (e.g., when a test was given, a brief note was written on the test itself explaining the main errors and difficulties).

The research was developed following the deontological standards recognized by the Declaration of Helsinki (2013 revision), following the recommendations of Good Clinical Practice of the EEC (document 111/3976/88 of July 1990) and the current Spanish legal regulations governing clinical research on humans (Royal Decree 561/1993 on clinical trials).

Statistical analysis

A descriptive analysis was performed and the normality of the study variables was analysed using the Kolmogorov-Smirnov test. The variables showed a normal distribution. The differential analysis on the scale of teachers' formative assessment practices according to students' gender (male vs. female) and attention (lower vs. higher) was carried out using the Student's *t*-test. Effect size was calculated using Cohen's *d* (0.20 = small, 0.50 = medium, and 0.80 = large effect) (Cumming & Calin-Jageman, 2016). Inferential analysis was carried out using an analysis of bivariate correlations between the study variables (Pearson's test). A linear regression analysis was also conducted to study the dependency relationship between attention and the students' perception of teachers' formative assessment. Statistical significance was set at a $p < .05$. Statistical analysis of the data was performed using Statistical Package for Social Science® software (v.30.0 by SPSS Inc., Chicago, Illinois, USA).

Results

When analysing the differences in the responses of the students' perception of teachers' formative assessment dimensions considering gender (Table 1), the Student's *t*-test showed no significant differences ($p > .05$). However, considering the attention variables, significant differences were found in the number of errors in favour of males (2.68 vs. 2.10, $t = 1.054$, $df = 144.002$, $p < .05$, $d = 0.32$).

Table 1*Basic descriptive data of the study sample according to gender*

Variables	Males	Females	<i>p</i>	<i>d</i>
	(<i>n</i> = 93) <i>M</i> ± <i>SD</i>	(<i>n</i> = 79) <i>M</i> ± <i>SD</i>		
FA associated with the qualification (summative) (3-15)	9.49 ± 2.67	9.03 ± 2.69	.25	0.16
Proactive FA (3-15)	10.83 ± 2.73	11.35 ± 2.46	.19	0.17
Interactive FA (4-20)	14.67 ± 3.11	14.79 ± 3.40	.80	0.08
Metacognitive (4-20)	14.62 ± 3.12	13.97 ± 4.98	.21	0.17
Retroactive FA (4-20)	14.29 ± 3.01	14.57 ± 3.75	.60	0.10
Adjusted FA (3-20)	10.23 ± 2.96	10.08 ± 3.08	.75	0.09
Global index of FA (21-105)	74.17 ± 13.04	73.79 ± 12.32	.84	0.08
Number of successes (0-60)	36.84 ± 9.22	37.22 ± 10.66	.40	0.10
Number of errors (0-60)	2.68 ± 0.26	2.10 ± 0.30	.02*	0.32
Number of omissions (0-60)	20.30 ± 9.41	20.20 ± 9.97	.65	0.10
Inhibitory control (1-100)	87.01 ± 17.92	88.18 ± 15.03	.14	0.18
Attentional efficiency (1-100)	61.57 ± 15.29	62.39 ± 17.36	.53	0.10
Global Attention Index (1-9)	5.15 ± 2.21	5.28 ± 2.24	.97	0.02
Age (years)	10.21 ± 0.64	10.51 ± 0.48	.17	0.17

Note. FA – Formative assessment; *M* ± *SD* = Mean ± Standard Deviation; **p* < .05; calculated with Student's *t*-test; *d* = *d* of Cohen's *d*.

For the inferential analysis, a Pearson's *r* test was applied to analyse the possible correlation between the study variables. The analysis of bivariate correlations showed that higher values in the formative metacognitive assessment correlated with higher values in the number of omissions and lower values in the number of successes, attentional efficiency, and global attention index (*p*_s < .05).

Table 2*Bivariate correlations between students' perception of the PE teacher's formative assessment practices and attention*

Variables	Hits	Errors	Omissions	Inhibitory control	Attentional efficiency	Global Attention Index
	<i>r</i> (<i>p</i>)	<i>r</i> (<i>p</i>)	<i>r</i> (<i>p</i>)	<i>r</i> (<i>p</i>)	<i>r</i> (<i>p</i>)	<i>r</i> (<i>p</i>)
FA associated with the qualification (summative)	-.05 (.55)	.02 (.76)	.02 (.78)	-.04 (.64)	-.04 (.61)	-.06 (.46)
Proactive FA	.10 (.23)	.07 (.38)	-.09 (.29)	-.12 (.37)	.09 (.24)	.08 (.33)
Interactive FA	.04 (.69)	.01 (.84)	-.04 (.37)	.07 (.47)	.06 (.44)	-.01 (.91)
Metacognitive FA	-.19 (.02)*	.10 (.76)	.18 (.03)*	-.41 (.59)	-.19 (.01)*	-.18 (.02)*
Retroactive FA	-.04 (.54)	.01 (.84)	.03 (.69)	.03 (.64)	-.04 (.54)	-.05 (.19)
Adjusted FA	-.09 (.81)	.01 (.16)	-.03 (.63)	-.07 (.34)	-.04 (.96)	-.09 (.27)
Global index of FA	-.05 (.51)	.05 (.48)	.01 (.84)	-.03 (.77)	-.04 (.59)	-.01 (.22)

Note. FA – Formative assessment; **p* < .05.

Table 3 shows the analysis of formative assessment practices according to the level of attention. Student's *t*-test detected statistically significant differences in metacognitive (14.85 vs. 13.64, $t = 1.927$, $df = 134.834$, $p < .05$, $d = .21$) and retrospective (15.30 vs. 14.30, $t = 2.150$, $df = 147.665$, $p < .05$, $d = .26$) formative assessment in favour of those with a lower level of attention.

Table 3

Differential data between students' perception of the PE teacher's formative assessment practices and level of attention

Variables	Lower Attention	Higher Attention	<i>p</i>	<i>d</i>
	<i>n</i> = 88 <i>M</i> ± <i>SD</i>	<i>n</i> = 84 <i>M</i> ± <i>SD</i>		
FA associated with the qualification (summative) (3-15).	9.63 ± 2.64	9.17 ± 2.88	.36	0.10
Proactive FA (3-15).	11.54 ± 2.55	11.62 ± 2.17	.80	0.08
Interactive FA (4-20).	15.15 ± 3.41	14.51 ± 3.26	.29	0.12
Metacognitive FA (4-20).	14.85 ± 3.64	13.64 ± 3.57	.04*	0.21
Retroactive FA (4-20).	15.60 ± 3.08	14.30 ± 3.48	.03*	0.26
Adjusted FA (3-20).	10.55 ± 2.72	9.87 ± 2.87	.19	0.16
Global index of FA (21-105).	77.29 ± 13.14	73.11 ± 11.26	.06	0.19

Note. FA – Formative assessment; *M* ± *SD* = Mean ± Standard Deviation; * $p < .05$; calculated with Student's *t*-test; *d* = *d* of Cohen's *d*.

Finally, in order to perform a predictive analysis of the students' perception of teachers' FA on the level of students' attention, a linear regression analysis test was carried out (see table 4). The model yielded $R^2 = .28$. The ANOVA yielded $F = 2.64$, $df1 = 6$, $df2 = 153.677$, $p = .03$, and it was found that lower values in attention were associated with higher values in metacognitive formative assessment ($\beta = -.19$, $p = .02$). These differences were maintained after adjusting the model for age and gender.

Table 4

Association between students' perception of the PE teacher's formative assessment practices and attention

Variables	Global Attention Index			
	β	<i>SE</i>	<i>t</i>	<i>p</i>
FA associated with the qualification (summative)	-.06	0.11	-0.06	.46
Proactive FA	.08	0.10	0.96	.33
Interactive FA	-.01	0.13	-0.11	.91
Metacognitive FA	-.19	0.14	-2.21	.02*
Retroactive FA	-.11	0.13	-1.31	.19
Adjusted FA	-.09	0.11	-1.10	.27
Global index of FA	-.11	0.49	-1.21	.22

Note. FA – Formative assessment; * $p < .05$.

Discussion

The aim of this study was to analyse the relationship between students' perception of the formative assessment practices of physical education teachers as a function of their level of attention. The main findings show that a lower level of students' attention is associated with their higher perception of teachers' metacognitive assessment practice, which is associated with internal information processing, and with teachers' retroactive assessment practice, which is related to the anticipation of learning difficulties.

Given that no studies have been found in the scientific literature on schoolchildren at any educational stage that analyse the association between these variables from the student's perception in the area of Physical Education, this prevents us from making direct comparisons. Likewise, the studies that analyse the relationship between formative assessment practices and student cognitive performance are very scarce in primary school students (Herranz & López, 2017; Molina Soria et al., 2020), hence the original focus of our study. In this sense, these results take on greater importance given the age of the sample, since these are transcendental stages of life where greater feedback in the construction of their learning can have an impact on students' academic achievement (Rosa-Guillamón et al., 2019).

Bearing in mind that Physical Education students have mostly stated that they always or almost always know what they are working on in class (Herranz & López, 2017), these results may be due to the fact that students who are less attentive have, in turn, more cognitive and motor difficulties in the subject of Physical Education and, therefore, the teacher has to provide them with more feedback, in order to maximise the students' academic achievement (Kulhavi, 1977). In this sense, assessing metacognition is not specifically measuring how much a student says or does, but helping them to become aware of their strategic procedures throughout the entire teaching and learning process, related to the specific knowledge they are appropriating (Hortigüela-Alcalá et al., 2015).

Retroactive assessment practices, on the other hand, are assessments that allow for the creation of learning opportunities after carrying out a punctual measurement at the end of a motor situation. In other words, carrying out reinforcement exercises after carrying out a punctual assessment to achieve that learning (Sáiz-Manzanares & Montero-García, 2015). Hence, it is possible that students with less attention experience greater academic difficulties, for which the teacher applies, in greater quantity, a formative assessment approach. This aspect was carried out since the assessment of the learning of students with and without difficulties is the curricular element that most influences how students learn, influencing the entire teaching-learning process (López-Pastor et al., 2019).

Furthermore, the results found in the study by Hernán et al. (2019) indicate that the application of formative assessment systems improves student involvement and participation in their own learning and favours the

regulation of the teaching and learning process. Students take the area of PE more seriously and teachers organise the teaching process better in search of assessment systems that are more coherent with their educational beliefs, especially valuing participation in ongoing training activities that provide them with useful and applicable experiences in their daily practice. This aspect is in line with Hortigüela-Alcalá et al. (2019), who indicate that the purpose of designing the formative assessment of any educational process is to guarantee the conditions, in the time frame in which it is carried out, for truly competent and conscious learning. Learning that, through the promotion of the autonomy and organisational capacity of the student, allows them to conceive their true contribution to the solution of tasks through enjoyment.

In fact, students feel that being able to participate in their assessment and marking processes always or almost always helps them to learn more, realise their mistakes, and know where they need to improve. All of this helps students to perceive that their learning and academic performance improves thanks to the use of these formative assessment systems (González et al., 2021; Herranz & López, 2017). For other students, formative assessment allows them to move towards “authentic assessment” systems, as they help to generate a strong relationship between theory and practice, as well as the acquisition of knowledge and competences that are more applicable in real work situations, especially to cater for diversity (Gallardo-Fuentes et al., 2020). However, Physical Education teachers highlight the workload involved, both for teachers and students, in the application of formative assessment (Molina Soria et al., 2020).

Along these lines, teachers report problems in coping with the diverse abilities of students in Primary Education (Japundža-Milisavljević et al., 2022), which may affect their personal satisfaction as teachers (Žunić-Pavlović & Pavlović, 2020). In this sense, creating a good school climate, and especially formative school programmes and practices in the domain of learning, can contribute to improving the adaptive characteristics of students with more difficulties (Đurišić & Žunić-Pavlović, 2021).

Conclusion, limitations and future prospects

Students with a lower level of attention perceive greater metacognitive and retroactive assessment practice in Physical Education classes (Students' perception of teachers' Formative metacognitive assessment is higher among students with a lower number of successes, more omissions and lower attentional efficacy). Also, boys have a higher number of errors than girls. Being aware of the importance of formative assessment in the teaching-learning process, it would be advisable to involve the whole educational community, in order to arouse interest among teachers, as it provides essential knowledge in their professional work, contributing to the improvement of academic development as well as to the comprehensive training of all schoolchildren.

The findings of this study should be interpreted with caution given the methodological limitations derived from its cross-sectional nature (causal relationships cannot be established), as well as the size of the sample.

A further limitation is that the questionnaire captures the students' views on the formative assessment applied by the teacher. This view is therefore subjective, since the nature of perception and one's perspective is always subjective and interpretative, and, therefore, not objective.

Aware of these limitations, for the future, we propose a longitudinal study with a larger sample, collecting the formative assessment applied by the teacher in an objective manner, the application of these formative assessment systems in other academic subjects in both primary and other educational stages. We also consider other variables such as the Physical Education teaching profile, teaching hours, initial training and continuing education of teachers, and the inclusion of other variables related to student perceptions.

References

- Azpilicueta Amorín, M. (2020). Los beneficios de una correcta evaluación formativa en el autoaprendizaje de los alumnos [The benefits of proper formative assessment for students' self-learning]. *Journal of Supranational Policies of Education*, 12, 2-25. <https://doi.org/10.15366/jospoe2020.12.001>
- Carrillo-López, P. J. (2022). Escape Room III Coronavirus Covid-19 en escolares de primaria de la isla de Fuerteventura en España [Escape Room III Coronavirus Covid-19 in primary school children on the island of Fuerteventura in Spain]. *Revista gestión de las personas y tecnología*, 15(43), 43-63. <http://dx.doi.org/10.35588/gpt.v15i43.5473>
- Carrillo-López, P. J., & Hortigüela-Alcalá, D. (2022). Impact of formative assessment on weight status and diet quality in elementary school children. *Sportis*, 8(1), 19-39. <https://doi.org/10.17979/sportis.2022.8.1.8671>
- Cerón Urzua, C., Cossio-Bolaños, M. A., Pezoa-Fuentes, P., & Gómez-Campos, R. (2020). Diseño y validación de un cuestionario para evaluar desempeño docente asociado a las prácticas evaluativas formativas [Design and validation of a questionnaire to evaluate teaching performance associated with formative evaluative practices]. *Revista Complutense de Educación*, 31(4), 63-72. <https://doi.org/10.5209/rced.65512>
- Córdoba Jiménez, T., López Pastor, V. M., & Sebastiani Obrador, E. (2018). ¿Por qué hago evaluación formativa en Educación Física? Relato autobiográfico de un docente [Why do I do formative assessment in Physical Education? A teacher's autobiographical account]. *Estudios pedagógicos (Valdivia)*, 44(2), 21-38. <https://doi.org/10.4067/S0718-07052018000200021>
- Crespo-Eguílaz, N., Narbona, J., Peralta, F., & Repáraz, R. (2006). Medida de atención sostenida y del control de la impulsividad en niños: nueva modalidad de aplicación del Test de Percepción de Diferencias "Caras" [Measure of sustained attention and impulsiveness control in children: New way of administering the Faces, Differences Perception Test]. *Infancia y Aprendizaje*, 29(2), 219-232. <https://doi.org/10.1174/021037006776789926>
- Cumming, G., & Calin-Jageman, R. (2016). *Introduction to the new statistics: Estimation, open science, and beyond*. Routledge. <https://doi.org/10.4324/9781315708607>

- Durišić, M., & Žunić-Pavlović, V. (2021). Školska klima i adaptivne karakteristike učenika mladih razreda osnovne škole [School climate and adaptive characteristics of younger primary school students]. *Specijalna edukacija i rehabilitacija*, 20(2), 93-108. <https://doi.org/10.5937/specedreh20-32979>
- Gallardo-Fuentes, F., López-Pastor, V., Martínez-Angulo, C., & Carter-Thuillier, B. (2020). Evaluación formativa en educación física y atención a la diversidad [Formative evaluation in physical education and the attention paid to diversity]. *Magis, Revista Internacional de Investigación en Educación*, 12(25), 169-186. <https://doi.org/10.11144/Javeriana.m12-25.efef>
- Gamo, J. R. (2017). *Ponencia: El TDAH y la importancia de la respuesta en el entorno José* [Lecture: ADHD and the importance of the response in the environment Joseph] [Video]. YouTube. <https://youtu.be/fNzjKGRIt0>
- González, D. H., Arribas, J. C., & López-Pastor, V. M. (2021). Incidencia de la formación inicial y permanente del profesorado en la aplicación de la evaluación formativa y compartida en educación física [Incidence of pre-service and in-service teacher education in the application of formative and shared assessment in physical education]. *Retos*, (41), 533-543. <https://doi.org/10.47197/retos.v0i41.86090>
- Guzmán-Simón, F., Torres-Gordillo, J. J., & Caballero, K. (2020). Understanding assessment processes for communicative competence through an analysis of teachers' reported practice. *Education Sciences*, 10(4), Article 116. <https://doi.org/10.3390/educsci10040116>
- Hernán, E. J., Pastor, V., & Brunicardi, D. (2019). ¿Por qué hago evaluación formativa y compartida y/o evaluación para el aprendizaje en EF? La influencia de la formación inicial y permanente del profesorado [Why do formative and shared assessment and/or assessment for learning in Physical Education? The influence of initial and in-service teacher education]. *Retos*, (36), 37-43. <https://doi.org/10.47197/retos.v36i36.66478>
- Herranz, M., & López, V. M. (2017). Perspectiva del alumnado sobre su participación en los procesos de evaluación formativa y compartida en educación física en primaria: Un estudio de caso [Students' perspectives on their participation in formative and shared assessment processes in primary physical education: A case study]. *EmásF: Revista Digital de Educación Física*, (48), 27-48.
- Hortigüela-Alcalá, D., García, V., Benito, V., & Villaverde, V. (2016). Influencia del sistema de evaluación empleado en la percepción del alumno sobre su aprendizaje y las competencias docentes [Influence of the assessment system used on students' perception of their learning and teaching skills]. *Revista Infancia, Educación y Aprendizaje*, 2(1), 20-42. <https://doi.org/10.22370/ieya.2016.2.1.582>
- Hortigüela-Alcalá, D., Pérez-Pueyo, Á., & Calvo, G. (2019). Pero...¿A qué nos referimos realmente con la evaluación formativa y compartida?: Confusiones habituales y reflexiones prácticas [But what do we really mean by formative and shared evaluation: Common confusions and practical reflections?]. *Revista Iberoamericana de Evaluación Educativa*, 12(1), 13-27. <https://doi.org/10.15366/riee2019.12.1.001>
- Hortigüela-Alcalá, D., Pérez-Pueyo, A., & Abella, V. (2015). ¿De qué manera se implica el alumnado en el aprendizaje? Análisis de su percepción en procesos de evaluación formativa [How are students involved in learning? Analysis of their perception in formative assessment processes]. *Revista de Investigación en Educación*, 13(1), 88-104.
- Janković-Nikolić, M. D. (2020). Empatija i sistematičnost kod dece predškolskog uzrasta [Empathy and systemizing in preschool children]. *Specijalna edukacija i rehabilitacija*, 19(3), 195-210. <https://doi.org/10.5937/specedreh19-29169>

- Japundža-Milisavljević, M. M., Đurić-Zdravković, A. A., & Milanović-Dobrota, B. Z. (2022). Stavovi prosvetnih radnika prema inkluziji [Educators' attitudes towards inclusive education]. *Specijalna edukacija i rehabilitacija*, 21(1), 15-30. <https://doi.org/10.5937/specedreh21-34279>
- Kluger, A. N., & DeNisi, A. (1996). The effects of feedback intervention on performance: A historical review, a metaanalysis, and a preliminary feedback intervention theory. *Psychological Bulletin*, 119(2), 254-284. <https://doi.org/10.1037/0033-2909.119.2.254>
- Kulhavi, R. W. (1977). Feedback in written instruction. *Review of Educational Research*, 47(2), 211-232. <https://doi.org/10.3102/00346543047002211>
- López-Pastor, V. M., Sonllea, M., & Martínez, S. (2019). Evaluación formativa y compartida en educación [Formative and shared evaluation in education]. *Revista Iberoamericana de Evaluación Educativa*, 12(1), 5-9.
- López-Pastor, V. M., Molina, M., Pascual, C., & Manrique, J. C. (2020). la importancia de utilizar la evaluación formativa y compartida en la formación inicial del profesorado de educación física: Los proyectos de aprendizaje tutorado como ejemplo de buena práctica [the importance of using formative and shared assessment in initial teacher training in physical education: Mentored learning projects as an example of good practice]. *Retos*, 37, 630-627. <https://doi.org/10.47197/retos.v37i37.74193>
- López-Lozano, L., Solís, E., & Azcárate, P. (2018). Evolution of ideas about assessment in science: Incidence of a formative process. *Research in Science Education*, 48(5), 915-937. <https://doi.org/10.1007/s11165-016-9591-1>
- Molina Soria, M, Pascual Arias, C., & López Pastor, V. M. (2020). El uso de sistemas de evaluación formativa y compartida en las aulas de educación física en educación primaria [The use of formative and shared assessment systems in primary physical education classrooms]. *Educación Física y Deporte*, 39(1). <http://doi.org/10.17533/udea.efyd.v39n1a04>
- Rosa-Guillamón, A, García-Canto, E., & Carrillo-López, P. J. (2019). Relación entre capacidad aeróbica y el nivel de atención en escolares de primaria [Relationship between aerobic capacity and attention span in primary schoolchildren]. *Retos*, 35, 36-41. <https://doi.org/10.47197/retos.v0i35.60729>
- Rosales, M. (2014). Proceso evaluativo: Evaluación sumativa, evaluación formativa y assesment su impacto en la educación actual [Evaluative process: Summative evaluation, formative evaluation and assesment and their impact on education today]. In *Congreso Iberoamericano de Ciencia, Tecnología, Innovación y Educación*, 4, Article 662.
- Rueda, M. R., Pozuelos, J. P., & Cómbita, L. M. (2015). Cognitive neuroscience of attention: From brain mechanisms to individual differences in efficiency. *AIMS Neuroscience*, 2(4), 183-202. <https://doi.org/10.3934/Neuroscience.2015.4.183>
- Sáiz-Manzanares, M. C., & Montero-García, E. (2015). Metacognition, self-regulation and assesment in problem-solving processes at university. In A. Peña-Ayala (Ed.), *Metacognition: Fundaments, applications, and trends* (pp. 107-133). Springer. https://doi.org/10.1007/978-3-319-11062-2_5
- Soria, M., Arias, C., Hortigüela-Alcalá, D., & Garcimartín, C. (2022). Análisis de la percepción del alumnado sobre su aprendizaje en sistemas de evaluación compartida [Analysis of students' perceptions of their learning in shared assesment systems]. *Revista Iberoamericana de Evaluación Educativa*, 15(1). <https://doi.org/10.15366/riee2022.15.1.003%20>

- Talanquer, V. (2015). La importancia de la evaluación formativa [The importance of formative evaluation]. *Educación Química*, 26(3), 177-179. <https://doi.org/10.1016/j.eq.2015.05.001>
- Thurstone, L. L., & Yela, M. (2019). *Caras-R: Test de percepción de diferencias-revisado: Manual [R-Faces: Difference perception test-revised: Manual]*. Tea.
- Žunić-Pavlović, V. P., & Pavlović, M. V. (2020). Samoefikasnost i zadovoljstvo poslom nastavnika u školama za učenike sa smetnjama u razvoju [Self-efficacy and job satisfaction of teachers in schools for students with disabilities]. *Specijalna edukacija i rehabilitacija*, 19(3), 165-179. <https://doi.org/10.5937/specedreh19-28267>

Formativno ocenjivanje u fizičkom vaspitanju i njegov odnos prema nivou pažnje dece osnovnoškolskog uzrasta

Pedro José Carrillo-López^a, Rubén Maneiro-Dios^b,
José Enrique Moral-García^c

^a Vlada Kanarskih Ostrva, Ministarstvo prosvete, Fuerteventura, Španija

^b Papski univerzitet u Salamanki, Salamanka, Španija

^c Univerzitet u Sevilji, Sevilja, Španija

Uvod: Cilj ovog istraživanja bio je da se analizira povezanost između percepcije učenika osnovnih škola o primeni formativnog ocenjivanja od strane nastavnika fizičkog vaspitanja i nivoa njihove pažnje. *Metode:* U ovoj deskriptivnoj transverzalnoj studiji, koja je obuhvatila 172 učenika, pažnja je procenjena testom Percepcija sličnosti i razlika, a praksa nastavnika u formativnom ocenjivanju putem upitnika o uspešnosti nastavnika koji je u vezi sa praksom formativnog ocenjivanja i čiji su rezultati validirani. *Rezultati:* S obzirom na pol, Studentov t-test nije pokazao značajne razlike, osim u broju grešaka u korist dečaka ($p < .05$). S obzirom na nivo pažnje, nadene su statistički značajne razlike u metakognitivnom ($p < .05$) i retrospektivnom ($p < .05$) formativnom ocenjivanju u korist onih sa nižim nivoom pažnje. Međutim, test linearne regresije pokazao je negativnu povezanost između pažnje i metakognitivnog formativnog ocenjivanja ($R^2 = .28$). *Zaključak:* Može se zaključiti da je niži nivo pažnje izgleda povezan sa povišenom percepcijom učenika osnovnih škola o primeni metakognitivnog ocenjivanja koje je povezano sa internom obradom informacija i sa primenom retroaktivnog ocenjivanja, što je povezano sa pretpostavljenim teškoćama u učenju. Imajući u vidu značaj formativnog ocenjivanja u procesu nastave i učenja, bilo bi preporučljivo da se uključi celokupna obrazovna zajednica, kako bi se podstaklo interesovanje nastavnika, jer ono pruža suštinska znanja u njihovom profesionalnom radu, doprinosi unapređenju akademskog razvoja i sveobuhvatnoj obuci sve dece školskog uzrasta.

Ključne reči: pažnja, formativno ocenjivanje, deca školskog uzrasta, fizičko vaspitanje, obrazovanje

PRIMLJENO: 16.02.2022.

REVIDIRANO: 05.06.2022.

PRIHVACENO: 14.06.2022.