

Empowering students in physical fitness through assessment for learning in physical education

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Published online: May 31, 2024

Accepted for publication : May 15, 2024

DOI:10.7752/jpes.2024.05135

Abstract:

Physical fitness education plays a pivotal role in enhancing students' overall well-being and must be effectively integrated into Physical Education curriculum. Research underscores the transformative impact of Assessment for Learning in improving teaching quality, student engagement and learning outcomes across various educational settings. In this study, we aim to investigate students' viewpoints on the integration of Assessment for Learning strategies in Physical Education fitness education. Thirty-six high school students from two classes participated in the study, taught by two preservice Physical Education teachers. Data collection comprised two focus groups of five students from each class and a questionnaire applied at the end of the teaching experience. A mixed-methods approach was used, incorporating both quantitative and qualitative dimensions to triangulate data. The focus group content was analysed using thematic procedures and two main themes were identified: (i) teachers' teaching and (ii) students' learning. The quantitative data from the questionnaire were analysed through descriptive measures. Findings suggest that the Assessment for Learning strategies employed played a crucial role in enhancing students' awareness and comprehension of the learning fitness objectives. Students highly valued the teacher's initiatives, particularly the enthusiasm, detailed feedback and collaborative group activities and strategies related to Assessment for Learning. These aspects increased their involvement and awareness and, combined with group learning and Assessment for Learning, led to personal growth. Students also noted an increased sense of responsibility for their own and their peers' learning journeys in fitness. This study underscores the transformative potential of Assessment for Learning strategies in Physical Education, emphasizing the significance of nurturing supportive learning environments that empower students to take charge of their learning and encourage meaningful engagement. Pre-service teachers enhance their teaching through reflective practices with students regarding fitness education, highlighting the importance of incorporating Assessment for Learning training into teacher education programmes. Future educators must be equipped with the knowledge and skills to approach this area from a salutogenic perspective and employ student-centred approaches effectively.

Key Words: Salutogenic Approach; Formative Assessment; Collaborative Learning; Teacher Education.

Introduction

Physical fitness education holds significant importance within an educational context, with Physical Education (PE) positioned to play a pivotal role. As children progress throughout their formative years, there tends to be a decline in motivation to participate in PE and Physical Activity (PA), leading to a decrease in PA levels (Mayorga Vega & Viciano, 2015). However, by extending PE objectives beyond merely mitigating the risks of illness to actively fostering resilience and promoting health (Quennerstedt, 2019), a shift in behaviour might be achievable. The overarching goal should prioritize creating and nurturing an environment conducive to cultivate an active lifestyle both within and beyond the confines of the school setting (Pate et al., 2011), embracing a salutogenic approach rather than a pathogenic one.

Towards this idea, McConnell (2010) emphasises that a strong fitness education curriculum can provide students with the tools and skills needed for them to choose to be active not only now, but also for life. Indeed, the essence of any educational endeavour lies in fostering learning and a learner-centred approach, wherein students assess their fitness levels, interpret the results and develop a personal program regarding their strengths and difficulties (McConnell, 2010).

Inevitably, the role of the teacher is paramount, as a facilitator of learning, actively involved in the process, transcending the traditional role of a mere guide on the side (Goodyear & Dudley, 2015). For effective teaching, a structured evaluation process is needed, focused on the specific goals defined by students. This process should guide students towards the intended goals of assessment, facilitating their progression (Batista et

al., 2019; Borghouts et al., 2020; Moura, Silva, et al., 2021). Effective teaching involves adapting both the content and delivery methods to optimize learning opportunities and assess student progress (Batista & de Moura, 2019).

According to Roldão (2007), assessment has been deeply connected to a classifying or certifying dimension, induced by curriculums that are merely presenting and describing the contents through programs. The introduction of (allegedly) different types of assessment (diagnostic, summative, prognostic...) helps, even more, to confuse what should be its main role: to regulate learning, encompassing the process and the product, as sides of the same coin. To that extent, the evaluation of the product of learning carried out by students helps to understand the process that sustained them and, at the same time, serves to improve it and to create the starting point for new learning. Roldão (2007) also emphasizes that, considering a more current understanding, assessment is an eminently formative regulation process, where 'giving knowledge' and 'grades' must be replaced by a concept focused on the individual process, with differentiated learning paths. In this approach, students have their own time and learning becomes the object of a continuous formative process.

From the perspective of Borghouts et al. (2020), assessment is the process through which information about student learning is obtained, interpreted and communicated, about one or more predefined objectives to be achieved, serving multiple education purposes: (i) guiding and supporting the learning process; (ii) informing teachers about their teaching and curriculum effectiveness; (iii) deciding whether students can progress to the next stage of learning or whether they can be given a formal qualification; (iv) providing evidence of student learning to other relevant stakeholders (accountability).

Research on assessment in PE does not yet provide much conclusive data, mainly connected to the practices used by teachers. Studies carried out in Australia and the Netherlands suggest that instructional alignment in PE is weak (Borghouts et al., 2017; Georgakis & Wilson, 2012). Another evidence is that teachers acquire little information about what students achieve in terms of knowledge acquired and motor learning performed, classifying them based on attendance, equipment used, participation and effort. In a study designed to test a systematic observation instrument for formal assessment, Mars et al. (2018) concluded that the observed teachers essentially used informal assessment strategies and classified the students' effort in aspects of managing their performance. Several studies point to an assessment predominantly focused on subjective aspects such as effort, preparation, and sportsmanship (Borghouts et al., 2017). Lorente-Catalán and Kirk (2016) also refer to the high prevalence of evaluative practices linked to the learning product, for example, in physical fitness (PF) tests and motor skills isolated from their real application context. Therefore, it is not surprising that students feel some confusion about the objectives of PE and how assessment is carried out, as mentioned by Chatzopoulos et al. (2006), Redelius and Hay (2012) and Zhu (2015). In this context, it is important to consider the concept of Assessment for Learning (AfL) in its broad dimension, as any type of assessment whose priority in construction and practice is to serve the purpose of promoting student learning (López-Pastor et al., 2013; Tolgfors, 2018), in a process for students' and teachers' use, deciding where students are, what they need to achieve and the best way to get there (Moura et al., 2024; Quitério, 2018).

Assessment for Learning

AfL can fit into the concept of formative assessment, which is understood as the set of information that enhances the delivery of feedback to students about their learning and supports the subsequent planning and pedagogical intervention of teachers (Black & Wiliam, 1998; Hay, 2006). Formative assessment serves two purposes: (i) for teachers to review and adjust teaching and (ii) for students to know its evolution (Chng & Lund, 2018).

While formative assessment mainly informs the teacher about student involvement, AfL shows students how their learning is progressing, recognizing their role as decision-makers (MacPhail & Halbert, 2010). Training practices help diagnose needs and monitor progress towards the achievement of individualized goals and guide changes in the teacher's instructional perspective, AfL helps to know and understand learning goals, manage their progress and uses self-assessment and goal setting to stay tuned with the goals to be achieved (Chappuis et al., 2016).

Formative assessment becomes AfL when students actively engage in the learning process and use the information to inform their own decisions, placing students at the centre of the process. All AfL is formative, but not all formative assessments are AfL (Chng & Lund, 2018).

AfL is based on a constructivist perspective of learning (Hay, 2006; Tolgfors, 2018), using a self-regulated model (Black & Wiliam, 2009) in which teaching adapts to students' needs and even summative assessment techniques may have formative functions as long as properly framed feedback is provided.

Constructivist pedagogies are based on the idea of using current knowledge and past experiences as a frame of reference to construct new knowledge and meanings: (i) inspiring student initiative, (ii) accepting their autonomy, (iii) employing a cognitive language to challenge critical thinking, fostering independent and innovative thinking in constructing student responses, (iv) developing knowledge construction by challenging the student recognise prior learning, (v) providing opportunities for interaction between students, (vi) encouraging critical thinking and problem-solving individually and collectively, and (vii) giving time, directions, redirecting questions, and leading students to develop and integrate new knowledge and build new meanings (MacPhail et al., 2013).

Likewise, AfL seems to fit the theory of self-determination developed by (Deci & Ryan, 2012), in line with the basic psychological needs that comprise it: (i) autonomy, in carrying out the activity, (ii) competence, the ability to be effective in what someone proposes to do and (iii) connection, the desire to connect with others when performing tasks (Quitério, 2018).

In PE, there is growing evidence that supports the idea that self-determined forms of motivation are positively associated with higher levels of positive emotions, greater concentration, greater effort, preference for performing challenging tasks, intention to be physically active at work, leisure time and optional PE activities (Quitério, 2018). Intrinsic motivation related to active behaviours in PE classes and outside of them leads to higher-quality learning and creativity (Deci & Ryan, 2012).

AfL is based on five key principles (Black & Wiliam, 1998; MacPhail & Halbert, 2010; Tolgfors, 2018): (i) clarify and share learning intentions with students; (ii) design effective discussions, tasks and activities that highlight the learning desired to learn, taking into consideration the respective success criteria; (iii) provide feedback that makes the student move towards the desired direction; (iv) involve students in the assessment of their (and other students) learning; and (v) encourage students to be the 'owners' of their learning. According to William (2011), these principles can be operationalized by asking the following questions: (i) where is the student going?; (ii) where are you now?; and (iii) how will you get there?

Teachers who are in the field can interpret and carry out the stated strategies in different ways, depending on the subjectivity inherent to students and teachers and also the characteristics of the knowledge to be taught (Tolgfors, 2018). Consequently, AfL can function as empowerment, physical activation, constructive alignment, grade generator and negotiation. In the empowerment role, the student faces the creative challenge of finding their way to achieve their goals. AfL as physical activation puts the teacher as the organizer of the activities, producing feedback focused on the active participation, effort and collaboration of the students. The use of AfL as a constructive alignment aims to bridge the gap between teaching and learning, placing the teacher as a transmitter of existing content in the curriculum and the student as a client at the end of a delivery chain. AfL, as a grade generator, positions the teacher as the manager of the assessment, which is by standardized and administered content, according to predefined knowledge requirements (Batista & de Moura, 2019). Finally, the AfL can assume the role of negotiation, with the teacher using alternative assessment techniques, consequent to reflexive assessment practice, in response to the student's actions (Moura et al., 2024).

As stated by MacPhail and Halbert (2010), the use of formative assessment seems to have advantages in two different areas: (i) it promotes better quality of instruction and planning in the teaching role and (ii) in PE, it raises the teaching quality that, consequently, enhances student learning, increases the focus on learning and the degree of involvement. Several studies indicate that AfL can be a viable solution to solve accountability problems, and there is a consensus on its potential pedagogical benefits (Leirhaug & Annerstedt, 2016; MacPhail & Halbert, 2010).

The biggest challenge in the implementation of AfL seems to be the additional time needed to plan the lessons, which, in the opinion of MacPhail and Halbert (2010), is worth the effort. In applying AfL, the following strategies can be used (Chng & Lund, 2018): (i) self-assessment, (ii) hetero assessment, (iii) assessment of teacher observation; (iv) personal journal/portfolio, and (v) teacher-student conferences. Other approaches may be used, such as questionnaires, recordings or descriptive scales.

Research on AfL is a topic of growing interest in recent years. However, while much of the focus lies on its conceptual framework, there remains a dearth of studies exploring its application within intervention processes, specifically in PE (Leirhaug & Annerstedt, 2016). In light of the presented gap, this study aims to explore students' perspectives regarding the incorporation of AfL strategies within PE fitness education.

Material & methods

Context of the study

This study was conducted during the school placement of two PE preservice teachers (PSTs) enrolled in a two-year master's program at a public university in Portugal. Their placement took place at a cooperating school in northern Portugal. The first year of the program focuses on didactic and pedagogical modules at the university, while the second year emphasizes school placement. The PSTs receive support from both a cooperating teacher at the school and a teacher supervisor from the university. The cooperating school was purposively selected due to the cooperating teacher's extensive experience as a PE teacher and educator, his expertise in fitness education, and his involvement in a broader research project aimed at preparing future teachers to be practitioner researchers for more inclusive PE¹. The school's excellent PE facilities and the PSTs' commitment to their learning during the placement also played a role in the selection. The study was conducted over the second semester of the 2022/23 academic year, from February to May, encompassing a total of 13 classes.

Participants

A convenient sampling of 36 students (22 girls and 14 boys) participated due to the PSTs involved. These students were between 16 and 19 years old and enrolled in the first year of secondary education in Portugal. Study objectives were explained to students who voluntarily accepted to participate. All participants involved signed an

¹ PRIPE-PST project - Empowering pre-service teachers as practitioner researchers toward PE inclusive practices', grant no. 2022.09013.PTDC] <http://doi.org/10.54499/2022.09013.PTDC>, funded by national funds, through the Foundation for Science and Technology.

informed consent form to participate. Due to the minor age of some students, their parents had to sign the consent form, guaranteeing the conditions of anonymity, with the assignment of codes (A1, A2, ...) and informed of the right to withdraw from the study at any time. Anonymity and confidentiality were assured to all participants.

Data collection

In data collection, two instruments were used at the end of the teaching experience: (i) two focus groups and a (ii) a questionnaire of short answers. Ten students from the two classes participated in each of the focus groups, conducted by the first author and recorded with a digital recorder. A previous analysis of the existing literature on AfL intervention programs was carried out to find the central themes to be discussed in the focus group. Examples of these themes are: (i) 'students' knowledge of the objectives', (ii) 'students' participation in the assessment process'; (iii) 'knowing the learning and assessment criteria' and (iv) 'teacher's feedback to enhance student learning'. The questionnaire was carried out extensively, considering every student participating in the program. It consisted of four questions: (i) 'Q1: Did you receive feedback about the development of your skills in PF?'; (ii) 'Q2: Did you talk to the teacher about your goals for PF?'; (iii) Q3: 'Were you involved in the processes of self and peer assessment?'; and Q4: 'Did you know the PE goals to PF?'. The answers to the questions range from Almost Never (1), Rarely (2), Occasionally (3), and Almost Always (4).

Data analysis

Given the purpose of the study, a mixed-methods approach was used, incorporating both quantitative and qualitative dimensions to triangulate data, as recommended by (Creswell, 2009).

The recording of the focus groups was listened to ensure familiarity with the recorded content. Subsequently, the material was transcribed into a Word file with the greatest possible transparency and fulfilled with the interventions of each participant.

Thematic analysis was employed to process the data, providing a straightforward method that enables rich and detailed examination by identifying patterns and themes (Braun & Clarke, 2012). The procedures included the following phases: (i) double reading of the interventions throughout the discussion to familiarize with the data and take notes on relevant issues, (ii) defining key points and interesting characteristics of the data, (iii) identifying common characteristics in participants' interventions, defining standard themes, and selecting representative excerpts for those themes, (iv) reviewing the codes, main and sub-themes, and discarding those lacking relevance to the study, and (v) designating of the different themes. After this analysis two main themes were considered: (i) teachers' teaching and (ii) students' learning. The data from the questionnaire was analysed using basic statistic descriptive measures, such as frequencies and averages.

Results

Teachers' teaching

Following the teacher's action, students favourably appreciate some of his options, namely the variability of practice, characterized by the constant alternation of the contents taught connected to the fitness activities, as stated by A1 and A2.

A1: '... we don't have that repetition. The sports don't get tiring because it's always changing and the fitness exercises are related to the sport.' / A2: '... what I would like to see extended is, perhaps, the variation between PF and sports ... we are not always doing the same.'

Students also judge positively the classroom atmosphere built by the teacher, mainly due to the nature of the positive reinforcement encouraging engagement, persistence with the fitness plan and the enthusiasm shown, as mentioned by A3 and A4.

A3: '... having someone say «You can do it!» gives us a thought that we will make it ...' / A4: '... if we have someone encouraging us, we can do much more than our brain tells us ... believe that we can do better ...'.

Prescriptive feedback is seen by students as very important for their progress and skills development. As we can see from A6, A3 and A9 statements.

A6: '... the teacher started by telling me to worry more about my breathing control and when I started to focus more on that, I felt that I improved a lot.' / A2: 'Feedback is extremely essential ...' / A9: 'The teacher was giving help that brought improvements.'

The creation and implementation of working groups in fitness work was a strategic decision by the teacher, yielding notably positive outcomes on students' behaviour. This approach was particularly noteworthy for its innovative character, demonstrating that the heterogeneity of the groups fostered students' engagement in class activities.

A7: '... working in a group is more motivating than working alone.' / A2: 'Something I liked... was the fact that in a group there are people with very different physical conditions.' / A1: '... it was something I had never done before in PE... having to be aware of each other... helping each other... it was very important.'

The cooperation between teachers and students in the definition of their objectives was another strategy that proved to be rather helpful. Students felt autonomous, forcing them to be even more aware and conscious of every step of the process, being involved in it.

A4: '... it forces us to think and set goals for ourselves...' / A3: '... talking about our personal goals... it was something that motivated us... I managed to focus a lot on that to... reach goals and I think I managed to get there.'

The teacher's definition of moments for student self-assessment, triggering self-reference, proved to be extremely important in enhancing students' abilities and increasing their levels of awareness of the work they are doing through the process.

A7: 'It was a moment of reflection. We were able to see at what we were better and at what we were worse.' / A8: '... it was much more focused on the individual... it helped us to get to know our abilities better.' / A1: 'It forced us to be aware of what we were doing in class and of our abilities.'

In the feedback processes, the beneficial impact of furnishing students with information regarding their learning status and actionable steps to enhance their skills appears evident. This information acts as guidance for students, facilitating their progress. Consequently, this strategy seems to enhance students' awareness of the objectives and foster their engagement in PE.

A1: '... it is difficult to be trying to evolve when we don't know where we have to go ... it is more difficult to evolve if we do not know where we are. Being constantly informed creates awareness in us and makes evolution much easier.' / A7: '...very important to give us (...) awareness of what we can do and where we can improve...'

Besides that, with the additional information given to the students through specific teaching artefacts, they were able to evolve towards the desired goals.

A9: '... it helped a little to improve...' / A4: '... they provided us with information, documents. And I think that forced us to try to look for solutions.'

The strategy that included the organization of group sessions was also highlighted, functioning as a clear guideline for future work.

A4: '... even when we were not seeing them (the solutions), we had a session with the groups where the teacher spoke to us ... was directed.'

One of the teacher's instructional tools was the feedback about the students' learning stage. This data can be seen by the results obtained from the questionnaire in the Q1 question (Did you receive feedback about the development of your skills in PF?). The average obtained by the entire sample was 3.73, a close value considering the maximum of 4. The findings indicated that students reported receiving feedback about the development of their PF abilities. Furthermore, it should be noted that 72% is the percentage of students who claim to have received feedback 'almost always'.

Like what happened in Q1 question, the average of the answers obtained in Q4 question (Did you know the PE goals to PF?) was high (\bar{x} =3.79). This value reveals that most students' answers were at level 4 ('almost always' – around 77.8%). It is worth noting that only 22.2% of the students answered with 'sometimes', without any response falling below that value. This is a positive indicator, demonstrating that the overwhelming majority of students were 'almost always' aware of the learning objectives about PF

Students' learning

Concerning PE and fitness content, students expressed favourable opinions based on their experiences throughout the school year, as mentioned by A4 and A3.

A4: 'I am suspicious because I like PE, but in any case, I think it was a very good year.' / A3: '... I felt that at the beginning of the year, my physical condition it was worse than now, so I think there was an improvement...'

Students also referred to cooperative learning as one of the aspects that most positively impressed, developing, in particular, interpersonal relationships (A7: '... I think it is important to see others because we can learn some things with them.'). These interpersonal dynamics are particularly highlighted by A1: 'It helps to improve the physical level, but also ... the interpersonal level and the relationships between us.', highlighting that it also contributed to their personal development.

Group activities raised students' levels of mutual help, underscoring a deeper involvement of all in the proposed tasks. This emphasized the concern and respect for others, considering individual differences and putting into evidence the importance of participation in heterogeneous groups. Students also expressed feeling more accountable for their own and their peers' learning.

A2: '... the collaboration of all... Everyone helped each other. All at the same pace. Everyone watching if the others were okay. There was always that concern about keeping exercise at a level that didn't lead to immense exhaustion.' / A6: 'We should try to do it slower to keep up with everyone (...) We tried to do it all at the same time so that the whole group was coordinated.'

A2: '... not everyone has the same rhythm. So sometimes it is necessary to be by the person's side and maybe that is an incentive, like: «You are running slower, but I'll go with you and help you to evolve in whatever is necessary.»' / A9: '... a greater sense of responsibility... The simple fact that we have colleagues who do not have the same skills as us or the same facilities (...) gives us a sense of responsibility because someone is counting on us.' / A4: 'Having someone dependent on us makes us or should, at least, force us to be our best version.'

AfL strategies such as self and peer-assessment were perceived as very present in the teaching-learning process by students. We can see this from the questionnaire answers to Q3 question (Were you involved in the processes of self and peer assessment?). The average of the results obtained was also quite positive (\bar{x} =3.56). Contrary to what happened in the previous questions, two students (5.5%) answered this question with the value 2

(‘few times’). Then, 33.3% of the students answered with ‘sometimes’ and the remaining elements of the sample declared to have been involved in processes of self and peer assessment ‘almost always’.

Concerning to Q2 question (Did you talk to the teacher about your goals for PF?), although the generally positive answers, yielded a slightly lower average of results ($\bar{x} = 3.14$). Although the majority (41.7%) of the sample stated they had ‘almost always’ talked to the teacher about their goals, three students (8.3%) stated they had never done it, five (13.9%) stated they had done a few times’ and 13 (36.1%) reported only ‘sometimes’.

Table 1 illustrates the findings obtained from this quantitative analysis. Notably, discrepancies in responses between the two classes are evident, along with their respective averages. Class two exhibited slightly higher results compared to class one. Furthermore, it is noteworthy that in class two, none of the students answered with the lowest scale (‘rarely’ or ‘rarely’) for any question, in contrast to class one.

Table 1 – Average of the answers to the questions (per class and in the whole sample)

	Q1	Q2	Q3	Q4
\bar{x} (Class 1)	3,70	2,85	3,50	3,70
Almost Never (1)	0 (0%)	3 (8,3%)	0 (0%)	0 (0%)
Rarely (2)	0 (0%)	5 (13,9%)	2 (5,5%)	0 (0%)
Occasionally (3)	6 (16,7%)	4 (11,1%)	6 (16,7%)	6 (16,7%)
Almost Always (4)	14 (38,9%)	8 (22,2%)	12 (33,3%)	14 (38,9%)
\bar{x} (Class 2)	3,75	3,44	3,63	3,88
Almost Never (1)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Rarely (2)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Occasionally (3)	4 (11,1%)	9 (25%)	6 (16,7%)	2 (5,5%)
Almost Always (4)	12 (33,3%)	7 (19,5)	10 (27,8%)	14 (38,9%)
\bar{x} (Global)	3,73	3,14	3,56	3,79
Almost Never (1)	0 (0%)	3 (8,3%)	0 (0%)	0 (0%)
Rarely (2)	0 (0%)	5 (13,9%)	2 (5,5%)	0 (0%)
Occasionally (3)	10 (27,8%)	13 (36,1%)	12 (33,4%)	8 (22,2%)
Almost Always (4)	26 (72,2%)	15 (41,7%)	22 (61,1%)	28 (77,8%)

Dicussion

The results suggest that AfL strategies, as emphasised by Chappuis et al. (2016), played a crucial role in improving students' understanding and awareness of learning objectives. These strategies enabled students to manage their fitness progress by establishing goals aligned with their needs and motivations. This underscores the benefits of actively involving students in the learning process, providing them with the necessary information to make well-informed decisions. This approach is consistent with the principles of the social constructivist perspective of learning advocated by Hay (2006), Tolgfors (2018) and Moura et al. (2021; Moura et al., 2024). It also supports Quitério's (2018) claim that self-determined forms of motivation are positively associated with higher levels of engagement, greater effort and intention to be active. Moreover, there is evidence that self-determined motivation is associated with higher levels of commitment and positive emotions.

According to the students' voices, it was clear that the actions of the PSTs fulfilled the five key principles of AfL. These principles include sharing learning goals and success criteria, involving students in self- and peer-assessment, and providing feedback to help students progress (Black & Wiliam, 1998; MacPhail & Halbert, 2010; Tolgfors, 2018). Additionally, it was noted that the three questions suggested by (Wiliam & Leahy, 2016) for the use of AfL are straightforward and help PSTs clarify to students 'where they are', 'where they are going', and 'how they can get there'. Therefore, integrating AfL strategies with the physical fitness PF domain can enhance the effectiveness of intervention programmes and promote skills related to personal and social responsibility.

When comparing Tolgfors's (2018) suggestions for interpreting and implementing AfL with the findings of this study, we can see that AfL can serve multiple purposes. This is due to the subjective interpretation of the PSTs and the perceived needs of the students. The empowerment aspect of AfL stands out as a key strategy for engaging students in physical fitness. Students showed a sense of ownership and responsibility for their fitness learning journey, engaging in decision-making and problem-solving tasks set by both the teacher and the nature of the activities.

Regarding AfL as motivational element for exercise, characterized by feedback focused on active participation, effort, and collaboration among students, it appears that this function was effectively fulfilled. Students reported a positive classroom environment and noted the teachers' reinforcement and cooperative work among peers as contributing factors. Concerning the constructive alignment function, there is evidence to suggest its achievement in both classes. According to the students, the knowledge transmitted by the teacher facilitated their make decision-making and problem-solving abilities. This alignment between teaching and learning was observed, as concepts conveyed by the teacher were effectively applied by students in self-referencing, self-assessment and peer assessment. However, the AfL function as a generator of classifications was not evident in any aspect of the observed context. According to Tolgfors (2018) and Moura et al. (2021, 2024), this AfL function arises or should arise with greater

emphasis in contexts where student motivation is directly linked to the grades they intend to obtain. However, in this context, this was not observed as the students from the two classes demonstrated high levels of intrinsic motivation, focused on learning and skill acquisition rather than grades. AfL as negotiation emerged as a significant aspect highlighted in students' statements. They described a negotiation process characterized by collaborative discussions during group meetings, where short and medium-term objectives were deliberated. Students need to know the objectives to make their own decisions and the teacher plays a crucial role as a mediator in helping students understand the goals and their attainability (Batista et al., 2019; Moura, Graça, et al., 2021; Moura et al., 2024).

The use of feedback by the PSTs focused on active participation, effort, and collaboration among students was effective. Students considered it an important factor in improving their motivation and engagement in the practice. Students reported a positive classroom environment and noted the PSTs' reinforcement and cooperative work among peers as contributing factors for being engaged in the fitness programme.

The knowledge transmitted by the PSTs was also mentioned by the students as a factor that facilitated their decision-making and problem-solving. This alignment between teaching and learning was observed, as concepts conveyed by the teacher were effectively applied by students in self-referencing, self-assessment and peer assessment. However, the AfL function as a generator of classifications was not evident in any aspect of the observed context. According to Tolgfors (2018) and Moura et al. (2021, 2024), this AfL function arises or should arise with greater emphasis in contexts where student motivation is directly linked to the grades they intend to obtain. However, in this context, this was not observed as the students from the two classes demonstrated high levels of intrinsic motivation, focused on learning and skill acquisition rather than grades. AfL as negotiation emerged as a significant aspect highlighted in students' statements. They described a negotiation process characterized by collaborative discussions during group meetings, where short and medium-term objectives were deliberated. Students need to know the objectives to make their own decisions and the teacher plays a crucial role as a mediator in helping students understand the goals and their attainability (Batista et al., 2019; Moura, Graça, et al., 2021; Moura et al., 2024).

Group work, combined with AfL strategies, greatly enhanced students' involvement in classes, and created a supportive and safe learning environment that promotes a sense of belonging among students, increasing their opportunities for learning (Scanlon et al., 2022). Furthermore, collaborative work fosters interpersonal relationships, communication skills, and students' autonomy. Therefore, AfL enhanced by cooperative learning strategies can become an important tool for the development of a student's profile.

It is also important to emphasize the deliberate selection of heterogeneous groups, encompassing students of different levels and abilities, to maximize the learning potential derived from this diversity. The heterogeneity within each group stimulates greater mutual support among students and fosters a heightened sense of concern, responsibility, and respect for their peers' differences, something that must be prioritized in PE classes. Although the students' testimonials do not explicitly mention it, we support the idea that recognizing both strengths and weaknesses is crucial for improving the teaching-learning process. Indeed, according to MacPhail and Halbert (2010) and Tolgfors (2018), this strategy empowers teachers to tailor tasks and learning objectives to students' individual needs, facilitating competence development.

Moreover, when conducted within a group setting, this recognition of strengths and difficulties enables students' true enhancers of their own and their peer's learning journeys, fostering collaborative efforts towards shared objectives. The compilation of the strategies used, namely AfL strategies, group work, recognising strengths and weaknesses and goal setting, constitutes invaluable tools for cultivating students' personal and social responsibility.

Vries et al. (2022) underline that AfL increases students' motivation by focusing on the process and its implementation. Consequently, integrating AfL strategies into PE practices has the potential to significantly impact students' engagement, making it an effective approach for enhancing learning, involvement and motivation for PE. The findings indicated that AfL is a vehicle capable of transporting students towards the acquisition of intra- and interpersonal skills. Students' perceptions underline that the implementation of AfL principles promotes increased classroom participation, making them more autonomous and aware of the teaching-learning process. In addition, the strategies implemented promoted an increased spirit of mutual cooperation, respect for peers and their differences and a sense of responsibility for peers' learning.

The strategies implemented were carried out by PSTs with limited teaching experience and no specialized training in PF or AfL. We believe that this lack of knowledge and skills could be two reasons why teachers do not move forward to implement these AfL principles in their classes. Therefore, as Moura, Graça, et al. (2021), we seriously consider that teacher training courses should integrate into their study cycles to teach future PE teachers how to use AfL.

The strategies implemented were carried out by pre-service teachers with limited teaching experience and no specialised training in PF or AfL. We believe that this lack of knowledge and skills could be two reasons why teachers do not move forward to implement these AfL principles in their classrooms. Therefore, like Moura et al. (2021), we seriously consider that teacher training courses should be integrated into their study cycles to teach future PE teachers how to use AfL.

Conclusions

The implementation of AfL principles in PE fitness education appears to improve students' engagement and understanding of the learning objectives, as well as their motivation, autonomy and involvement in the teaching-learning process. Furthermore, the development of intra and interpersonal skills essential for student's personal growth was achieved.

Overall, the results highlight the transformative potential of AfL strategies in PF and in PE in general, emphasizing the importance of creating supportive learning environments that empower students to take ownership of their learning and foster meaningful engagement. By promoting a student-centred approach to teaching and learning, AfL not only enhances academic achievement but also contributes to the holistic development of student's personal and social responsibility, thereby enriching their educational experiences and preparing them for lifelong learning. The pre-service teachers improve their teaching by reflecting with their students about fitness education, underscoring the importance of incorporating AfL training into teacher education programs to prepare future educators with knowledge and skills to work this area in a salutogenic perspective and with centred student approaches.

Limitations and Suggestions for future research

It is important to acknowledge the privileged context of this research, wherein secondary school students exhibit a developed awareness of the importance of PE in their lives inside and outside school. As such, replicating this research in other contexts (geographic, socioeconomic, age group, ...) would provide valuable insights into students' perceptions of AfL strategies in PE classes across varied settings.

While significant progress was observed in students' PF, attributing this solely to AfL principles and strategies would be premature given the absence of a control group for comparison. Hence, future studies should incorporate control groups to ascertain whether AfL indeed influences students' PF development.

Acknowledgement

This work was funded by national funds, through the Foundation for Science and Technology (FCT), under the project PRIPE-PST - Empowering pre-service teachers as practitioner researchers toward PE inclusive practices', [grant no. 2022.09013.PTDC] <http://doi.org/10.54499/2022.09013.PTDC>.

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