

PEDAGOGY

Students' Attitude Toward Physical Education: Relations With Physical Activity, Physical Fitness, and Self-Concept

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Abstract

This study investigated the relation between students' attitude toward physical education (PE) and its correlates by simultaneously considering age, sex, enjoying physical activity (PA), self-perceived physically active lifestyle (PAL), self-perception of physical competence, PA, and cardiovascular fitness (CF). This cross-sectional study included 235 students ($M = 15.2 \pm 2.5$ years). All correlates of students' at-

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titude toward PE were assessed via questionnaires. CF was assessed by via Fitnessgram. Pearson correlation coefficients confirmed a large positive correlation between attitude toward PE and PA enjoyment ($r = .71, p < .001$) and PAL ($r = .52, p < .001$). Moderate positive correlations were found for self-perception of physical competence, nonorganized PA, organized PA, and CF ($.24 \geq r \leq .48, ps < .001$). Multiple linear regression showed that enjoying PA ($\beta = .62, p < .001$) was the only significant predictor when all variables were considered simultaneously. The model explained 55% of explained variance on students' attitude toward PE. Binary logistic regressions showed that students who reported enjoying PA were 9.3 times more likely to report a positive attitude toward PE. In contrast, students who did not enjoy PA and those who overperformed in the CF test were 4.2 and 1.1, respectively, more likely to report a negative attitude toward PE. Coherently across all analyses, from all the predictors studied, PA enjoyment seems to be the most powerful, showing the highest contribution in explaining students' attitude toward PE.

School-based physical education (PE) is one of the most widely available sources of physical activity (PA) for children and adolescents. It is well accepted that PE plays an important role in the overall educational process by helping students to develop a healthy lifestyle (Expert Group on Health-Enhancing Physical Activity [EGHEPA], 2014). School-based PE interventions have been shown to be effective in increasing levels of PA and possibly improving physical fitness of students (Kriemler et al., 2011). Nevertheless, research has revealed that students' motivation to participate in PE at school declines as they grow older (Gu & Zhang, 2016). On the other hand, for many students, PE is the only opportunity to be engaged in PA (Morgan, Beighle, & Pangrazi, 2007; Pate, Ward, O'Neill, & Dowda, 2007). This suggests the importance of better understanding students' attitude toward PE and its correlates for the development of interventions that could contribute to increasing levels of engagement in both PE and independent PA.

Potential correlates of students' attitude toward PE have been studied. Among such factors, age, sex, enjoying PA, self-perception of a physically active lifestyle, self-perception of physical competence, PA, and physical fitness have been shown to strongly relate to students' attitude toward PE (Carroll & Loumidis, 2001; Colquitt, Walker, Langdon, McCollum, & Pomazal, 2012; Gu & Zhang, 2016;

Hagger, Cale, & Almond, 1997; Hünük & Demirhan, 2010; Pate et al., 2007; Stiller & Alferman, 2007; Zeng, Hipscher, & Leung, 2011). For example, while boys and girls seem to show different levels of interest in PE classes, the available literature is still inconsistent. Some studies have shown that boys have a more positive attitude toward PE than girls do (Colley, Comber, & Hargreaves, 1994; Hünük & Demirhan, 2010; Koca, Aşçı, & Demirhan, 2005; Zeng et al., 2011), while others have shown no differences between males and females (Subramaniam & Silverman, 2007). These differences in students' attitudes could be attributed to previous experiences in PE, the level of skills, the PE teacher, the contents, the facilities, and the equipment. Therefore, identifying the primary reasons why some students do not like PE could contribute to the development of school-based interventions that are more effective.

It has been suggested that children and adolescents who have a more positive attitude toward PA are more likely engaged in PA at school and in their leisure time (Hünük & Demirhan, 2010; Koca & Demirhan, 2004; Subramaniam & Silverman, 2007). Similarly, students who experience enjoyment in organized and nonorganized PA show a more positive attitude toward PE at school (Subramaniam & Silverman, 2007). Consequently, PE teachers should help students to develop their physical skills and encourage them to be physically active on a daily basis.

Self-concept, defined as the general evaluation of oneself based on knowledge and an evaluation of one's competences and skills, is an important agent of behavior (Stiller & Alfermann, 2007). Physical educators who promote physically active lifestyles assume a significant role in improving physical self-concept, mainly by using a self-enhancement strategy, promoting self-esteem, and enhancing the skill development strategy and the students' physical competence (Ferrer-Caja & Weiss, 2000; Stiller & Alfermann, 2007). Hence, one can argue that PE classes may influence self-concept, improve competence, and support experiences of success, which could be a key factor for lifelong participation in PA. This highlights the importance of focused interventions in PE classes for the improvement of the motivational climate, the intrinsic motivation, and the general enjoyment (Gråstén, Jaakkola, Liukkonen, Watt, & Yli-Piipari, 2012; Stiller & Alfermann, 2007). This supports the idea that the creation

of a positive learning environment may affect students' learning and attitudes and could play a major role in enabling students to adopt a healthier lifestyle by incorporating regular PA.

Concerning the mentioned self-competence by itself, physical fitness (an integrated measure of psychoneurological, musculoskeletal, cardiorespiratory, blood-circulatory, and endocrine-metabolic functions) is an important well-known goal in PE (American College of Sports Medicine, 2014; EGHEPA, 2014). Research has shown that girls and boys with high physical fitness have a more positive attitude toward PE and better PA-related self-concept than those with low physical fitness do (Aktop, 2010; Colquitt et al., 2012). The improvement of physical fitness in PE classes can be a key component of the educative process, helping students to develop physical abilities, self-confidence, a positive physical concept, and generally, a more positive attitude toward PE and sports (Meredith & Welk, 2010).

Although there is a considerable amount of evidence on the correlates of students' attitude toward PE, studies have not examined the contribution of each aforementioned correlate while predicting the likelihood of students reporting a positive or negative attitude toward PE. This is, however, highly important because it would help to identify the variables that most strongly determine attitudes toward PE. This knowledge could serve as the basis for the design of specific school- and individual-based interventions to improve the students' attitude toward PE and, therefore, enhance PA in general.

This study followed a comprehensive approach in investigating the relations of students' attitude toward PE and its correlates by simultaneously considering multiple individual variables (age, sex, enjoying PA, self-perceived physically active lifestyle, self-perception of physical competence, PA, and physical fitness) and by differentiating the relationship patterns of correlates for students with a positive and those with a negative attitude toward PE.

Method

Study Design and Participants

In this cross-sectional study, all healthy students who attended the classes of nine trainee teachers and their promoters, in four urban public elementary and secondary schools from the city of Funchal

were considered eligible to participate. Of these 18 classes (330 students who attended the four schools), 235 students (89 boys, 146 girls) in the seventh to 12th grade, aged 10 to 22 years ($M = 15.2 \pm 2.5$ years), agreed to participate in the study. Participation was voluntary, and all students were assessed in 2016. Data were collected through online self-completion of questionnaires by each student, at the schools' informatics classroom. Physical fitness assessments were conducted in the gymnasium of each school through use of the same protocol and the same equipment and materials.

The study was conducted according to the ethical standards in sport and exercise science research (Harriss & Atkinson, 2009), and the study protocol received approval from the ethics committee of the University of Madeira and the educational authority (Governmental Secretary of Education). All procedures were explained to each participant, and written informed consent was granted by the parents or legal guardians before any assessment. The consent form briefly described the nature, purposes, procedures, data confidentiality, and potential outcomes of the study.

Reliability of Assessments

Nine trainee teachers in PE collected all data. Prior training for data collection was provided by a university training program. This program included theoretical and practical sessions. First, instructions and demonstrations for the physical fitness tests and questionnaires were given. Second, the field team members practiced on each other. Third, the team participated in a pilot study, for which all variables were assessed in 8 boys and 7 girls aged 16–18 years. These adolescents were assessed twice with an interval of 1 week. This pilot study indicated good to acceptable test–retest reliabilities for all assessments.

Students' Attitude Toward PE and Students' Self-Perceptions

For the assessment of students' attitude toward PE and PA, participants were asked, "What do you think about your PE lessons at school?" and "What do you think about practicing PA?" (see applications and validations of these questions by Aaro, Wold, Kannas, & Rimpelä, 1986). Answers were given on a 5-point Likert-type scale ranging from 1 = *I dislike it very much* to 5 = *I like it very much*.

Self-perception of PA was assessed via one question: “How do you classify your own lifestyle?” Responses were given on a 5-point Likert-type scale ranging from 1 = *sedentary* to 5 = *very active*.

Perceived Physical Competence

Perception of physical competence was assessed via Lintunen’s (1990) Perceived Physical Competence Scale, with six items regarding (1) movement skills, (2) agility, (3) endurance, (4) speed, (5) strength, and (6) courage, on a 5-point Likert-type scale. For analyses, a composite score (i.e., mean of the six items) was used.

Physical Activity

PA was assessed via a questionnaire developed by Piéron, Telama, Naul, and Almond (1997). Students’ PA participation was categorized into three types: structured or organized PA (OPA), unstructured or nonorganized PA (NOPA), and sport school activities (SS). The OPA was defined as sportive activities in a team or a collectivity guided by a trainer or other sports authority. NOPA was defined as nonguided sport activities such as walking, running, and sport games (except from school or team/collectivity contexts). SS was defined as sport-related school activities (for applications and validations of the Portuguese version of this questionnaire in students, see, e.g., Marques, Martins, Santos, Sarmiento, & Carreiro da Costa, 2014; Mota, Almeida, Santos, Ribeiro, & Santos, 2009; Mota & Esculcas, 2002).

Cardiovascular Fitness

Cardiovascular fitness was assessed via the progressive aerobic cardiovascular endurance run (PACER) test from Fitnessgram (Meredith & Welk, 2010). A detailed description of the evaluation procedures, equipment, scoring, and safety precautions can be found in the *Fitnessgram/Activitygram Test Administration Manual* (Meredith & Welk, 2010). Test–retest reliability for the PACER in the pilot study was established via calculation of the intraclass correlation coefficient (R). Test–retest reliability for PACER was 0.72 (95% CI [.12, .91]), indicating an acceptable level of reliability.

Statistics

First, Pearson's correlation coefficients inspected bivariate relations between age, sex, PA enjoyment, physically active lifestyle, self-perception of physical competence, PA, physical fitness, and students' attitude toward PE (using a continuous score).

Second, a standard multiple regression (MLR) analysis investigated the amount of variance in students' attitude toward PE that was explained by the related predictors, as well as the relative contribution of each of them.

Third, in a subsequent set of analyses, binary logistic regressions determined the contribution of the related predictors to positive and negative attitude toward PE separately. Responses on the question about the attitude toward PE lessons were given on a 5-point scale ranging from *I dislike it very much* = 1 to *I like it very much* = 5. For analysis purposes, the answers were then grouped into two categories: positive versus neutral attitudes toward PE (scores 4 and 5 = 1; score 3 = 0) and negative versus neutral attitude toward PE (scores 1 and 2 = 1; score 3 = 0).

These subsequent analyses investigated the detailed pattern of relationships separately for students with a positive and for those with a negative attitude toward PE. All statistical analyses were performed using IBM SPSS Statistics 20.0. The level of significance was set at 0.05.

Results

First, the Pearson product-moment correlation coefficient identified a strong and positive correlation between attitude toward PE and self-perceptions of PA enjoyment and physically active lifestyle (Table 1). Moderate positive correlations were found for self-perception of physical competence, NOPA, OPA, and PACER. No other significant correlations were seen.

Second, a model in which all previously observed significant relations were simultaneously accounted for was considered. Specifically, this analysis simultaneously examined the contributions of enjoying PA, physically active lifestyle, self-perception of physical competence, NOPA, OPA, and cardiovascular fitness in explaining

Table 1

Pearson Product–Moment Correlations Between Attitude Toward PE and Age, Sex, PA Enjoyment, Physically Active Lifestyle, Self-Perception of Physical Competence, PA, and Physical Fitness

Correlate	Attitude toward PE
Age	-.11 ^{ns}
Sex (0 male; 1 female)	-.09 ^{ns}
Self-perceptions	
Enjoying physical activity	.71 ^{***}
Physically active lifestyle	.52 ^{***}
Perception of physical competence	.51 ^{***}
Physical activity	
NOPA (days/week)	.24 ^{***}
OPA (days/week)	.26 ^{***}
SS (days/week)	.18 ^{ns}
Cardiovascular Fitness	
PACER	.34 ^{***}

Note. ns = not significant; NOPA = nonorganized physical activity; OPA = organized physical activity; SS = sport school activity; PACER = progressive aerobic cardiovascular endurance run test.

^{***} $p < .001$. ^{ns} $p > .05$.

the variance in students' attitude toward PE, controlling for age and sex (given the age and sex differences in PA and physical functioning commonly observed). In this model, enjoying PA was the only significant (positive) predictor of the attitude toward PE (Table 2). It explained 55% of the variance in students' attitude toward PE.

Third, the detailed pattern of relationships for students with a positive and for those with a negative attitude toward PE was subsequently examined. Specifically, binary logistic regressions were performed to examine the contribution of the predictors to the likelihood of students reporting a positive (versus a neutral) and a negative (versus a neutral) attitude toward PE.

For the positive attitude toward PE, enjoying PA made a unique significant contribution to the model, with an odds ratio of 9.3

Table 2

Standard MLR With Age, Sex, PA Enjoyment, Physically Active Lifestyle, Self-Perception of Physical Competence, Nonorganized PA, Organized PA, and Physical Fitness Predicting the Students' Attitude Toward PE

Correlate	b ± SE	β	p[†]	95% CI*
Age (years)	-.00 ± .02	-.01	.915	-.04, .03
Sex (0 male; 1 female)	-.01 ± .02	-.01	.888	-.17, .20
Enjoying physical activity	.64 ± .06	.62	< .001	.52, .76
Physically active lifestyle	.11 ± .06	.12	.093	-.02, .24
Self-perception of physical competence	.14 ± .09	.11	.112	-.03, .32
NOPA (days/week)	-.02 ± .02	-.04	.392	-.07, .03
OPA (days/week)	-.02 ± .03	-.05	.399	-.07, .03
PACER	.00 ± .00	.01	.813	-.01, .01
<i>R</i> ²	.55			

Note. NOPA = nonorganized physical activity; OPA = organized physical activity; PACER = progressive aerobic cardiovascular endurance run test.

[†]Significant contribution by an independent variable to the total explained variation in the model ($p < .05$). *95.0% confidence interval for B values.

(Table 3). This indicated that students who enjoyed PA were 9.3 times more likely to report a positive attitude toward PE. There were no other significant predictors. The model explained between 30% (Cox and Snell R^2) and 49% (Nagelkerke R^2) of variance in attitude toward PE and correctly classified 89% of cases.

For the negative attitude toward PE, enjoying PA and cardiovascular fitness made a significant contribution to the model, with an odds ratio of 4.2 and 1.1, respectively (Table 4). This indicated that students who did not enjoy PA and those who performed well in the cardiovascular fitness test were 4.2 and 1.1 times, respectively, more likely to report a negative attitude toward PE. There were no other significant predictors. The model explained between 36% (Cox and Snell R^2) and 50% (Nagelkerke R^2) of variance in attitude toward PE and correctly classified 81% of cases.

Table 3
Binary Logistic Regressions to Examine the Contribution of Each Predictor to the Likelihood of Students Reporting a Positive Versus a Neutral Attitude Toward PE

Correlate	B	SE	Wald	df	p	OR	95% CI for OR	
							Lower	Upper
Age (years)	.07	.10	.46	1	.498	1.07	.88	1.29
Sex (0 male; 1 female)	-.33	.61	.30	1	.582	0.72	.22	2.35
Enjoying PA	2.23	.49	20.97	1	<.001	9.30	3.58	24.15
Physically active lifestyle	.21	.34	.40	1	.529	1.24	.64	2.38
Self-perception of physical competence	.58	.47	1.53	1	.216	1.79	.71	4.51
NOPA (days/week)	-.19	.13	2.04	1	.153	.83	.64	1.07
OPA (days/week)	.10	.20	.28	1	.600	1.11	.75	1.64
PACER	.02	.02	.54	1	.464	1.02	.97	1.06

Note. NOPA = nonorganized physical activity; OPA = organized physical activity; PACER = progressive aerobic cardiovascular endurance run test.

Table 4

Binary Logistic Regressions to Examine the Contribution of Each Predictor to the Likelihood of Students Reporting a Negative Versus a Neutral Attitude Toward PE

Correlate	B	SE	Wald	df	p	OR	95% CI for OR	
							Lower	Upper
Age (years)	0.08	.20	.17	1	.684	1.09	.73	1.61
Sex (0 male; 1 female)	1.05	.99	1.13	1	.289	2.87	.41	20.04
Enjoying PA	-1.43	.53	7.28	1	.007	.240	.09	.68
Physically active lifestyle	-.99	.74	1.77	1	.183	.37	.09	1.60
Self-perception of physical competence	.62	.87	.50	1	.479	1.85	.34	10.18
NOPA (days/week)	-.03	.26	.01	1	.920	.97	.59	1.61
OPA (days/week)	.82	.44	3.48	1	.062	2.27	.96	5.38
PACER	.09	.04	4.58	1	.032	1.10	1.01	1.19

Note. NOPA = nonorganized physical activity; OPA = organized physical activity; PACER = progressive aerobic cardiovascular endurance run test.

Discussion

This study investigated the relation between students' attitude toward PE and its correlates in detail by simultaneously considering multiple individual variables (age, sex, enjoying PA, self-perceived physically active lifestyle, self-perception of physical competence, PA, and physical fitness).

The findings show no correlation between students' attitude toward PE and age nor sex. A possible explanation for this could be that the same experiences are presented to both male and female students and in all grades (and associated age groups). While some studies found that students' motivation to participate in PE at school seem to decline as they grow older (Gu & Zhang, 2016; Subramaniam & Silverman, 2007) and that boys seem to have a more positive attitude toward PE than girls do (Carroll & Loumidis, 2001; Colquitt et al., 2012; Hünük & Demirhan, 2010; Koca et al., 2005; Marques et al., 2014; Zeng et al., 2011), others have concluded that attitude toward PE may be unaffected by gender (Subramaniam & Silverman, 2007) and age (Tannehill & Zakrajsek, 1993). The large variety of instruments to assess attitude toward PE was used across these studies, and the differences in school and cultural contexts could explain some of these contradictory results.

The results of this study also confirm that students with a more positive attitude toward PE have higher levels of perceived competence (in terms of athletic qualities, skills, fitness, quickness, strength, and bravery). This is in line with the suggestion of Ferrer-Caja and Weiss (2000), who reported that those who have stronger beliefs about their physical competence are more likely to enjoy the activity than are those reporting lower levels of physical competence. Rationale for this can be found in self-determination theory (Deci & Ryan, 2000) and achievement goal theory (Nicholls, 1989). In a practical way, if PE educators create autonomy support in their classes (e.g., presenting interesting and enjoyable activities) and promote achievement of goals based on task competence, they will probably have more motivated students, who consequently show a more positive attitude toward PE.

Considering that a large percentage of children and adolescents fail to achieve the recommended levels of daily PA (Centers for Disease Control and Prevention, 2014; U.S. Department of Health

and Human Services, 2008) and that the level of PA tends to decline from childhood to adulthood (Currie et al., 2008), the role of PA in the attitude toward PE was investigated in this study. The study found that engagement in NOPA and OPA was positively correlated with students' attitude toward PE, suggesting that students who are more strongly engaged in sports and PA outside of school have a more positive attitude toward PE. Again, this is in line with the theoretical premise that children and adolescents who have a more positive attitude toward PE are more likely to also participate in PA outside of school and have higher levels of PA than those with less positive attitudes (Hünük & Demirhan, 2010; Koca & Demirhan, 2004; Subramaniam & Silverman, 2007). Therefore, one may argue that a positive attitude toward both PE and PA may be crucial for students' engagement in NOPA and OPA and that PE teachers should consider these important issues simultaneously through a focused and motivating intervention. Establishing a student-centered teaching style, where students take part in the learning process, could be a practical way for the teacher to establish a positive climate in classes and consequently increase interest in and enjoyment of PA. For example, the Sport Education Model is an adequate educational approach to trigger enjoyment (Siedentop, Hastie, & van der Mars, 2004), as well as, other general activities such as establishing a connection with local sport clubs or associations, bringing successful athletes to the school, and taking students to observe different sport matches and competitions.

Another important topic studied in this study was the relationship between cardiovascular fitness and attitude toward PE. As expected, a positive attitude toward PE was positively correlated with better performance on the PACER. This is in line with previous research showing that children and adolescents with higher levels of cardiovascular fitness tend to have a more positive attitude toward PE (Aktop, 2010; Colquitt et al., 2012). Once more, this reinforces the idea that students with better physical fitness may develop a better perception of physical competence, leading to greater participation in PA as well as to a more positive attitude toward PE at school. This has important implications for PE teaching. The development of physical fitness in PE teaching is an important component of the educative process. This could be a key factor in increasing the prob-

ability of students adopting regular PA habits and maintaining adequate levels of physical fitness, health, and functioning throughout life (Meredith & Welk, 2010).

The results of this study also confirm that enjoying PA is strongly correlated with having a positive attitude toward PE. This means that if students have enjoyable PA experiences, a more positive attitude toward PE at school will probably emerge. We may argue that PE educators have an important role in providing pleasant opportunities and positive experiences related to PA to improve students' positive attitudes toward PE. As a general strategy for PA promotion, this should be considered as a key element for the promotion of PA habits at school (Pate et al., 2007).

In a deeper statistical analysis with a multiple regression model simultaneously considering all factors in the model (age, sex, enjoying PA, self-perceived physically active lifestyle, self-perception of physical competence, NOPA, OPA, and cardiovascular fitness), enjoying PA emerged as the unique substantial predictor, accounting for 62% of the variance in students' attitude toward PE. Yet again, this is an interesting and important result suggesting that school- and individual-based interventions in PE should particularly target the enjoyment of PA (in addition to the other predictors).

With the purpose of exploring this relationship in more detail, this paper scrutinizes whether the relationship patterns differed between students with a positive and those with a negative attitude toward PE. This would be particularly relevant because it would identify the correlates of the different facets of attitude toward PE. According to previous results, an enjoyable PA experience was positively correlated with a positive attitude of students toward PE. These detailed findings again suggest that enjoyable PA experiences could foster positive attitudes toward PE and perhaps encourage lifelong participation in PA (Koca & Demirhan, 2004; Kriemler et al., 2011; Pate et al., 2007). Students who overperformed in the PACER were more likely to report a negative attitude toward PE. Simple correlations were suggestive that the better the cardiovascular fitness level, the more positive the attitude toward PE. Yet, in the examination of positive and negative facets of the attitude toward PE, a different relation pattern emerged. A relation of good cardiovascular fitness performance to negative attitude toward PE was observed in

the logistic regressions. This may be related to the hypothesis that if students are not presented with a challenging PA environment, their attitude in relation to PE may be negatively affected. Additionally, one might argue that students who attend PE classes in school have different cardiovascular fitness and awareness backgrounds. For those with high cardiovascular fitness performance and frequent involvement in rich sports experiences, the PE curricula may not be attractive or not challenging enough, leading to a mismatch between the student's actual physical capacity and the level of challenge experienced by that student in PE classes. As a practical implication, one may claim that a tailored approach in PE classes is mandatory for the development of individualized interventions that guarantee an attractive and physically challenging environment that matches the student's expectations and level of performance. This study adds evidence to prior research on the fact that physical fitness performance is an important target in PE that requires continuing evaluation and a contributing factor for the improvement of the quality of PE teaching (Gråstén et al., 2012; Stiller & Alfermann, 2007).

We acknowledge that we used a one-dimensional student-centered approach to investigate the attitude toward PE. In addition, the cross-sectional design of the study limits conclusions regarding the direction of relationships in terms of causality. Therefore, for a better understanding of the investigated relations, further longitudinal research that uses multidimensional attitude inventories should be developed. Additional information about contextual factors such as the quality of PE programs, the status of facilities and equipment at school, school traditions, and teacher skills and expertise should be considered.

In conclusion, several crucial modifiable factors are correlated with students' attitude toward PE. These factors include enjoying PA, self-perceived physically active lifestyle, self-perception of physical competence, NOPA, OPA, and cardiovascular fitness. From all of these predictors of the attitude toward PE, PA enjoyment seems to be the most powerful. A better understanding of attitude toward PE and its correlates, in the specific school context, seems to be critical for the development of school- and individual-based interventions that promote students' engagement in PE classes and PA in general. This is in line with the view that interventions should focus on es-

tabling tailored PE environments in which students feel comfortable, confident, and motivated (Chen, 1998; Hagger, Chatzisarantis, & Biddle, 2002). Several strategies can potentiate a positive motivational climate, such as the individualization of the teaching process, the increase of the students' autonomy, the recognition of students, and maximization of the time spent learning.

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