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Relationship between preference in teaching styles with participation in assessment and teaching styles that support basic psychological needs in Physical Education¹

Relación de las preferencias de los estilos de enseñanza con la participación en la evaluación y los estilos que apoyan las necesidades psicológicas básicas en Educación Física

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Abstract

The aim of this research was to analyze the relationships between the preference in teaching styles of Physical Education teachers with the participation of different agents in the assessment and the teaching styles that support psychological needs. Specifically, the following particular objectives were addressed: (i) To analyze the relationship between preference in teaching styles and the agents involved in students' assessment and grading; (ii) To analyze the relationship between preference in teaching styles and teaching styles that support basic psychological needs. A cross-sectional quantitative study was carried out between April and May 2021. A total of 995 Physical

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Education teachers from Spain participated. Three instruments were used to collect information: (i) The Physical Education Teaching Styles Questionnaire; (ii) The questionnaire on evaluation processes in Physical Education #EvalEF; and (iii) The scale of styles that supports psychological needs. The results show that (i) the preference for traditional teaching styles is inversely related to the use of participatory assessment and grading processes and the assessment of the teaching practice by students; (ii) the preference for the rest of the teaching styles studied is related to the different forms of student participation in assessment and grading and with the self-assessment of the teaching practice; and (iii) there is a positive relationship between teachers who support an ego-oriented climate and identification preferably with traditional styles and those who support a task climate, styles that support autonomy and those who support relationships and identification with individualizing, socializing, cognitive and creative styles.

Keywords: Teaching styles, autonomy, relationships, ego climate, task climate, self-assessment, peer assessment, grade.

Resumen

El objetivo de esta investigación es analizar las relaciones existentes entre la preferencia en los estilos de enseñanza por parte del profesorado de Educación Física con la participación de diferentes agentes en la evaluación y los estilos docentes que apoyan las necesidades psicológicas. Concretamente, se dará respuesta a los siguientes objetivos específicos: (i) Analizar la relación existente entre la preferencia en los estilos de enseñanza y los agentes involucrados en la evaluación y calificación del alumnado; (ii) Analizar la relación entre la preferencia en los estilos de enseñanza y los estilos docentes que apoyan las necesidades psicológicas básicas. Se llevó a cabo un estudio cuantitativo de corte transversal entre abril y mayo de 2021. Participaron un total de 995 docentes de Educación Física del territorio español. Se emplearon 3 instrumentos para la recogida de información: (i) Cuestionario de Estilos de Enseñanza en Educación Física; (ii) Cuestionario sobre procesos de evaluación en Educación Física #EvalEF; y (iii) Escala de estilos que apoyan las necesidades psicológicas. Los resultados muestran que (i) la preferencia por los estilos de enseñanza tradicionales se relaciona inversamente con el uso de procesos de evaluación y calificación participativos y la evaluación de la práctica docente por parte del alumnado; (ii) la preferencia por el resto de los estilos de enseñanza estudiados se relaciona con las diferentes formas de participación del alumnado en la evaluación y la calificación y con la autoevaluación de la práctica docente; y (iii) existe una relación positiva entre los docentes que apoyan un clima ego y la identificación preferentemente con los estilos tradicionales y aquellos que apoyan el clima tarea, los estilos que apoyan la autonomía y los que apoyan las relaciones y

la identificación con los estilos individualizadores, socializadores, cognitivos y creativos.

Palabras Clave: estilos enseñanza, autonomía, relaciones, clima ego, clima tarea, autoevaluación, coevaluación, calificación.

Introduction

The theory of the spectrum of teaching styles created by Muska Mosston in 1966 has been considered internationally as the pedagogical basis in the field of Physical Education (PE). The fundamental proposition of this theory is that teaching is governed by a single unifying process: decision making (Mosston & Ashworth, 2008). It presents pre-impact decisions, those that are made before teaching begins; impact decisions, made during its execution; and post-impact decisions, made after its execution, that is during evaluation (Mosston & Ashworth, 1993; 2008). Each successive behavior derives from the systematic and accumulative decisions made by the teacher and the students. In Spain, Delgado (1991) proposed reforming the teaching of PE using the proposal of Mosston & Ashworth (1993). He grouped the teaching styles into six families according to the capabilities that they foment in the students, reformulating some of Mosston's styles and adding some new ones (Delgado, 1991; Najera et al. 2020, Sicilia-Camacho & Brown, 2008):

- The traditional styles follow the models of classical teaching, based on the lecture, in which decisions are made exclusively by the teacher.
- Individualizing styles will produce self-motivated and individual learning in the students in which they can evaluate their execution and make decisions.
- Participatory and socializing styles are characterized by the participation of the students in the teaching and learning process, carrying out specific teaching functions like correcting, evaluating, informing etc. Moreover, the social aspect seems essential for the development of the students, which is why these styles promote

the development of their capabilities permitting them to participate as effective members of groups and global society.

- The cognitive styles present situations which force the students to solve motor problems using learning through discovery. These imply on the part of the teacher teaching through searching and a didactic intervention using a teaching technique through exploration, investigation and research,
- The teaching styles which promote creativity seek the development of original and innovative actions on the part of the students.

The application of these styles in the classroom is not independent of the rest of the elements that form part of the teaching learning process; the most important being the evaluation process. When we opt for active methodologies that encourage the students to be protagonists and assume their roles as builders of learning, there should be a coherent evaluation process which takes the students into account in the evaluation and grading process (García-Herranz & López-Pastor, 2015). The evaluation may be carried out by the teacher (heteroevaluation), the students may evaluate themselves (self-evaluation) or it can be done among the students (co-evaluation or peer evaluation) (Bores-García et al., 2020; Otero-Saborido et al., 2021). Consequently, the same agents can participate in the grading processes. Research has shown that the participation of the students in the evaluation processes promotes autonomy and the assumption of responsibilities, and foments processes of self-regulation (Zimmerman, 2000). Moreover, it involves the students in their own learning and decision making, through processes of dialogue, respect, equality, and shared responsibility (López-Pastor & Sicilia, 2017).

The way in which methodological processes are applied can influence in turn the motivation of the students in PE classes. Some studies have shown that the application of pedagogical models that require the students' active participation foment greater intrinsic motivation (Fernández-Espínola, 2020; Gil-Arias et al., 2021). This motivation of the students is influenced by the satisfaction or frustration of their basic psychological needs (BPN). The theory of self determination (Deci & Ryan, 2020) states that human beings have three innate and universal psychological needs, the need for competency, for autonomy and for relatedness, which must be satisfied to optimize their personal development, wellbeing and health (Abós-Catalán et al. 2018a; Deci & Ryan, 2000). The satisfaction of the need for competency refers to the fact that students perceive that they

are capable of carrying out the activities that they have to complete; the satisfaction of the need for autonomy is when the students perceive that they are responsible for their own actions and can make decisions; and that of relatedness when the students establish positive relations with the rest of the agents involved in the teaching learning process (Sevil-Serrano, 2018). Therefore, those teachers that carry out actions aimed at the satisfaction of these (BPN) are supporting their development. The achievement goals theory (Ames, 1992) indicates that the actions of the teacher and the way they are carried out influences the motivational climate that is generated. Thus, a motivational climate oriented towards the task will be generated when the focus is on the students' improvement, evaluating their progress and establishing individualized criteria; and a motivational climate oriented to the ego when the teacher establishes comparisons among the students, makes evaluations on the basis of the work of others or gives standard grades (García-González et al., 2021).

However, there are few studies about teaching styles that have dealt with the relation that can exist between them and evaluation processes; or the relation that can exist between the teaching styles and motivation or BPN. Among them can be found the study by Espada and Pineño (2020) that concludes that PE teachers state that the use of cognitive styles in class favors students' autonomy. Similarly, when using individualizing teaching styles the students can evaluate themselves and develop proprioception through internal feedback which will make it possible to develop practice in an autonomous way. Moreover, if the teacher uses participative and socializing teaching styles, as well as developing the students' autonomy through their participation in decision making, they will work on the relation among classmates, which will increase satisfaction with the classes and student's learning (Sánchez & Espada, 2018). Given the scarcity of studies and the diversity of approaches taken, it is necessary to delve more deeply into these relations.

Objectives

The objective of this research was to analyze the relations existing between the preference for teaching styles on the part of PE teachers and the participation of different agents for evaluation and the teaching styles

that support psychological needs. Specifically, the aims were to address the following specific objectives:

- To analyze the relation between the preference for teaching styles and the agents involved in the evaluation and grading of students.
- To analyze the relation between the preference for teaching styles and the teaching styles that support basic psychological needs.

Method

This investigation followed a quantitative cross-sectional design.

Sample

Random, incidental and probabilistic sampling of the PE teachers in Spain was used to select the participants. The characteristics of the sample are shown in Table 1. This study included a total of 995 PE teachers with a mean age of 42.26 (9.23) years, 65.4% of whom were men and 34.2% were women and 0.4% preferred not to state their sex. Of the total, 51.8% gave classes in primary education and 43.6% in secondary education and sixth form studies, and the remaining 5.6% gave classes at other stages (Infant education, Vocational training, Special education, etc.). They had a mean experience of 15.08 (9.94) years. Of the total sample 27.4% had a master's degree and 2.9% a doctorate.

TABLE I. Characteristics of the participating sample (n=995)

Items		%
Sex	Man	65.4
	Woman	34.2
	Not indicated	0.4
Educational stage	Primary Education	51.8
	Secondary Education	43.6
	Infant Education	1.1
	Vocational Training	1.3
	Special Education	0.5
	Others	1.7
Ownership of the school	State	76.3
	Private-Subsidized	22.7
Highest Academic Qualification Achieved	Degree	69.6
	Post-graduate	27.4
	Doctorate	2.9

Source: compiled by author

Procedure

The participants in the study completed a questionnaire between April and May 2021 that recorded independently the four scales used for this investigation. The questionnaire was created on the *Google Forms* platform and sent by email to the primary and secondary schools in Spain. The email asked those in charge of the schools to send the questionnaire to the school's PE teachers. All the participants were treated according to the ethical procedures of the *American Psychological Association* with regard to consent, confidentiality and anonymity of the participants.

Instruments

Three questionnaires were used to collect information:

- **The Questionnaire on Teaching Styles in Education (EEEF in its Spanish acronym):** Composed of 20 items organized in 5 dimensions (traditional teaching styles, individualizing teaching styles, socializing teaching styles, cognitive teaching styles and creative teaching styles). The questionnaire presents a Cronbach's alpha of 0.79 (Merino-Barrero, Valero-Valenzuela & Moreno-Murcia, 2017). The subscales present a Cronbach's Alpha of: (i) traditional styles = 0.73; (ii) individualizing styles = 0.70; (iii) participative and socializing styles = 0.76; (iv) cognitive styles = 0.70 and (v) creative styles = 0.75. The answers respond to a Likert-type scale where 1 corresponds to "Totally agree" and 5 to "Totally disagree". The sentence introducing the items was "As a physical education teacher, I think that---".
- **The Questionnaire on the Evaluation Process in PE #EvaIEF:** Composed of 81 items grouped in 13 dimensions. Specifically, this study used the dimensions of "Participants" and "Grading Procedures". The Participants dimension collects items related to who participates in the evaluation of the students (3 items) and the teachers (3 items); and the Grading Procedures dimension records items related to who participates in the grading of the students (5 items), and who evaluates the teaching activity (3 items). Specifically, in this study each of the items that make up the dimensions was used independently. The scale presents a Cronbach's Alpha of 0.94 (Zubillaga-Olague & Cañadas, 2021). It is answered using a Likert-type scale of 6 points: 1 Totally disagree and 6 Totally agree and the introductory sentence was "In your physical education classes..."
- **Need-Supportive Teaching Style Scale** (Abós-Catalán et al., 2018b): Composed of 15 items that measure the support for the task climate (5 items), support for the ego-oriented climate (3 items), support for autonomy (4 items) and support for relations (3 items). It is answered with a Likert-type scale of 5 points from 1 (Totally disagree) to 5 (Totally agree), The premise presenting the questions is "As a P.E. teacher..."

TABLE II. Synthesis of the characteristics of the questionnaires included in the investigation

	Number of items	Scale	Examples of items
Questionnaire on Teaching Styles in Physical Education			
Traditional	3	1-5	I set the pace of the class to make all students finish at the same time, without attending to individual differences.
Individualizing	3	1-5	The students should work at their own individual pace thus favoring their learning.
Socializing	6	1-5	The participation of the students in the teaching process favors their learning.
Cognitive	5	1-5	Using teaching through discovery favors students' autonomy
Creative	3	1-5	I enjoy it when I see my students working and creating choreographies in my class.
Questionnaire on the Evaluation Processes in Physical Education #EvalEF			
Evaluation			
Evaluation by the teacher	1	1-6	The Physical Education teacher evaluates the students.
Self-evaluation	1	1-6	The students evaluate themselves (self-evaluation).
Co-evaluation	1	1-6	The students evaluate their classmates (co-evaluation).
Grading			
Grading by the teacher	1	1-6	The grades are decided by the teacher.
Self-grading (partial or total)	1	1-6	The students self-grade establishing their own mark (partially or totally).
Dialogue grading (partial or total)	1	1-6	Grading is the result of a dialogue and consensus between the teachers and students (partially or totally).
Grading based on self-evaluation (partially or totally)	1	1-6	Grading based on self-evaluation (partially or totally).

Grading based on co-evaluation (partially or totally)	1	1-6	Grading is based on the co-evaluation among classmates (partially or totally).
Need-Supportive Teaching Style Scale			
Task support climate	5	1-5	The most important aspect is that my students progress yearly in their own skills.
Ego-oriented support climate	3	1-5	I try to make my students do better than their classmates.
Autonomy support	4	1-5	My students have the freedom to make decisions during my classes
Relations support	3	1-5	I try to get my students to really work together like a team in my classes.

Source: compiled by author

Statistical analysis

Statistical analysis was performed using SPSS (Windows, v.26.0). Statistical significance was set at $P < 0.05$. Normality was confirmed with the Kolmogorov-Smirnov test, and thus, parametric tests were used. All the variables are presented as mean \pm SD (standard deviation). Pearson's correlation was used to analyze the relations between preference for teaching styles and the items of participation in the evaluation and grading, satisfaction of BPN in the work, and preference for styles which support BPN. Values of under 0.1 refer to a null correlation, between 0.1 and 0.3 to a weak correlation, between 0.3 and 0.5 to a moderate correlation, and over 0.5 to a strong correlation

Results

Table III presents the descriptive statistics on the variables teaching styles, evaluation and grading. In the teaching styles, the main ones that stand out are the creative styles with the highest mean values (4.58 ± 0.54) and the traditional styles with the lowest means (2.71 ± 0.79). Regarding evaluation,

results reveal the predominance of evaluation by the teacher (5.47 ± 0.68), although the forms of student participation obtained mean values above the mid-point of the scale. The same tendency was evident with regard to grading, where grading by the teacher obtained the highest mean values (4.75 ± 1.28). With respect to the evaluation of the teaching, self-evaluation was the procedure with the highest mean (5.12 ± 1.11). High values were revealed for feelings of support for autonomy (3.52 ± 0.71) and relations (4.25 ± 0.73). On their part, the teachers also showed a high climate of support for the task (4.53 ± 0.63) and a limited one of support for the ego (1.73 ± 0.85).

TABLE III. Descriptive statistics of the variables teaching styles, evaluation and grading

	Total
n	995
Teaching styles	(1-5)
Traditional	2.71 ± 0.79
Individualizing	4.24 ± 0.62
Socializing	4.37 ± 0.53
Cognitive	3.78 ± 0.57
Creative	4.58 ± 0.54
Evaluation	(1-6)
Evaluation by the teacher	5.47 ± 0.68
Self-evaluation	4.45 ± 1.20
Co-evaluation	4.32 ± 1.27
Grading	(1-6)
Grading by the teacher	4.75 ± 1.28
Self-grading (partial or total)	3.56 ± 1.39
Dialogue grading (partial or total)	3.55 ± 1.50
Grading based on self-evaluation (partially or totally)	3.50 ± 1.38
Grading based on co-evaluation (partially or totally)	3.47 ± 1.40
Need-Supportive Teaching Style Scale	1-5
Task support climate	4.53 ± 0.63
Ego-oriented support climate	1.73 ± 0.85
Support for autonomy	3.52 ± 0.71
Support for relations	4.25 ± 0.73

Source: compiled by author

The relation between the teaching styles with which the teachers identify and the forms of evaluating the students are presented in Table IV. There is an inverse relation between identification with the traditional styles and the use of participatory evaluation processes (self-evaluation $r=-0.248$ and co-evaluation $r=-0.230$). Positive and significant correlations were revealed between the rest of the teaching styles and different forms of evaluation.

TABLE IV. Relation between the teaching styles with which the teachers identify and the forms of evaluating the students

	Evaluation by the teacher	Self-evaluation	Co-evaluation
Traditional	0.006	-0.248**	-0.230**
Individualizing	0.257**	0.193**	0.146**
Socializing	0.340**	0.232**	0.186**
Cognitive	0.195**	0.152**	0.119**
Creative	0.344**	0.230**	0.215**

Source: compiled by author

Table V presents the relation between the teaching styles with which the teachers identify and the forms of grading the students. The positive relation between preference for the traditional teaching styles and grading by the teacher stands out ($r=0.243$; $P<0.001$). In contrast, the individualizing ($r=0.108$), socializing ($r=0.141$) and cognitive ($r=0.164$) styles are positively related with self-grading (all, $P<0.001$). The traditional styles are inversely correlated with dialogue grading, and grading based on self-evaluation and co-evaluation, although the relation is weak. Lastly the individualizing, socializing, cognitive and creative styles are positively related to dialogue grading, and grading based on self-evaluation and co-evaluation.

TABLE V. Relation between the teachings styles with which teachers identify and the forms of grading the students

	Grading by the teacher	Self-grading	Dialogue grading	Grading based on self-evaluation	Grading based on co-evaluation
Traditional	0.243**	-0.061	-0.066*	-0.068*	-0.076*
Individualizing	0.014	0.108**	0.163**	0.162**	0.123**
Socializing	0.067*	0.141**	0.169**	0.177**	0.121**
Cognitive	0.066*	0.164**	0.160**	0.193**	0.143**
Creative	0.065*	0.050	0.115**	0.096**	0.069*

Source: compiled by author

The relation between the styles that the teachers support and the teaching styles with which they identify is presented in Table VI. The results highlight that the teachers that support an ego-oriented climate identify preferentially with traditional styles ($r=0.303$; $P<0.001$). Also worthy of note is the positive relation between a task support environment, the styles that support autonomy and those that support relations with the individualizing, socializing, cognitive and creative styles.

TABLE VI. Relation among the styles that the teachers support and the teaching styles with which they identify.

	Traditional	Individualizing	Socializing	Cognitive	Creative
Task support climate	0.090*	0.363**	0.409**	0.267**	0.394**
Ego-oriented support climate	0.303**	-0.110**	-0.114**	0.068*	-0.157**
Styles that support autonomy	-0.102**	0.334**	0.367**	0.270**	0.293**
Styles that support relations	-0.022	0.388**	0.471**	0.324**	0.445**

Source: compiled by author

Discussion

This research has shown that: (i) The preference for traditional teaching styles is inversely related to the use of participatory evaluation and grading processes and the evaluation of the teaching on the part of the students; (ii) The preference for the rest of the teaching styles studied is related to the different forms of student participation in evaluation and grading and self-evaluation by the teacher; and (iii) There is a positive relation between the teachers who support an ego-oriented climate and the preferential identification with traditional styles and those who support a task climate, autonomy and relations and the identification with individualizing, socializing, cognitive and creative styles.

The descriptive data from the present study show how the teachers stated that they preferred creative teaching styles, while traditional styles received the lowest score from the teachers. These results are contrary to those obtained in previous research (Espada & Pineño, 2020; Jaakkola & Watt, 2011; Sympas et al., 2017) in which traditional styles were indicated as the preferred styles of the teachers. Similarly, the data from the present investigation are completely opposed to those of the study by Parsak & Saraç (2020) in which the teachers indicated that the traditional styles are those that they mostly use and that they never used the creative styles. This may signal a change in teaching intervention that is occurring in the context of Spanish PE.

In relation to the evaluation process, the results obtained in this investigation follow the line of previous studies where evaluation and grading by the teacher are used most frequently. Research like that of Cañadas y Santos-Pastor (2021) and Rodríguez & Zulaika (2016) show that the participatory forms of evaluation and grading are very seldom used at compulsory educational levels. It is also important to underline that the mean values of participation of the students are higher in evaluation processes than in grading processes where they do not attain the same value. This gives an image of how the teachers increasingly value students' participation in evaluation but are much more reticent to their participating in grading processes (Rodríguez & Zulaika, 2016).

Finally, with regard to the styles that support the satisfaction of BPN, there is a clear preference for the task support climate and support for relations, although the latter obtained lower values, coinciding with

previous investigations (Méndez-Giménez et al., 2013; Moreno-Murcia et al., 2009; Sevil-Serrano et al., 2017).

When relating teaching styles with the evaluation process, an inverse relation can be seen between the identification with the traditional teaching styles and the use of participatory evaluation processes on the part of the students. This relation is completely coherent, as traditional teaching styles are characterized by direct, unilateral teaching, in which the teacher makes the decisions in the teaching and learning process, including the evaluation process. Positive and significant correlations were established between the rest of the teaching styles and the different forms of evaluation, a fact which seems to indicate that, with the exception of the traditional teaching styles, any other generates a learning space where the students can participate in their evaluation process. Regarding the grading process, the positive relation between the preference for traditional styles and grading by the teacher stands out. Moreover, the preference for traditional styles is inversely related to dialogue grading, and grading based on self-evaluation and co-evaluation. As was indicated in previous investigations, teachers prefer using traditional styles because they perceive that they have greater control over the teaching-learning process (Najera et al., 2020). It is, therefore, coherent that these teachers also want to have control over grading (López-Pastor & Sicilia, 2017).

In the case of the individualizing, socializing and cognitive styles, they are positively related to self-evaluation. And these, together with the creative styles are positively related to dialogue grading, and grading based on self-evaluation and co-evaluation. In this respect, as concluded by Van Doren et al. (2021) support for students' autonomy correlates positively with a more active involvement in classes. In this same line of thought, students also show their preference for individualizing styles which allow them greater autonomy and increases their motivation (Brya et al., 2014). The inverse relation between preference for the traditional styles and evaluation on the part of the students stands out. The traditional styles are based solely on the teachers' instructions, and they are the ones who have control over all the decisions about the teaching and learning process (Najera et al., 2020). In the rest of the styles the relation between them and teachers' self-evaluation stands out, also relating to the rest of the forms of evaluation although more weakly.

There is no relation between the satisfaction of BPN and identification with the traditional teaching styles. However, there is a positive relation

between satisfaction of each of the BPN and the rest of the styles studied. This could be due to the fact that in the individualizing, socializing, cognitive and creative styles the students participate in some way in their learning process. In this line of thought, Diloy-Peña et al. (2021) state that PE teachers are agents of support for the satisfaction of BPN. They support the need for autonomy of the students, allowing them to be the decision makers in the teaching and learning process. The need for competence using interrogative feedback, permits them to identify the different rules of action of the proposed motor situations. Finally, support of social relations will be satisfied when teachers develop a favorable environment for fomenting the positive interaction and integration of the students.

The results highlight that the teachers who support an ego-oriented climate preferentially identify with the traditional styles. They also underline the positive relation between task climate support, styles that support autonomy and those that support relations and the identification with the individualizing, socializing, cognitive and creative styles. These data corroborate the results of the research by Moreno-Murcia et al. (2020) which presents the conclusion that active teaching styles predict support for autonomy.

Conclusion

This study has shown a relation between the traditional teaching styles and the forms of evaluation and grading on the part of the teachers, as well as support for an ego-oriented climate; in the same way, a weak relation has been shown between the preference for styles which grant a more important role to the students and their participation in evaluation and grading processes, and support for autonomy, relations and preference for a task climate. Among the strong points of this study is the fact that it is an original investigation that has not been previously explored, that sought to relate fundamental aspects for the development and coherence of teaching and learning processes. Moreover, it presents a very large sample of Spanish PE teachers. Among the limitations, we find that it was not able to delve more deeply into the reasons that lead teachers to prefer determined styles, not to carry out certain evaluative processes in

their classrooms, or to have one support style or another. Furthermore, as it was an original investigation it was difficult to find prior research to support and debate the findings.

Finally, this is a line of research that has many possible future paths for investigation. For example, to analyze the preference for styles and the way the teachers implement them, and the relation with the other elements of the evaluation process. It is also necessary to evaluate the students' perception of these processes and establish the impact that certain questions about the teaching and learning process (teaching styles, evaluation) have on the students' motivation and development.

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