Article

Effects of an Autonomy Support Intervention on the Involvement of Higher Education Students

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Abstract: Intervention studies based on Self-Determination Theory (SDT) in educational contexts prove the importance of the teacher's motivating interpersonal style, promoting positive results in students' motivation. However, college practices and processes have new challenges. This study examines the repercussions of an intervention program with autonomy support on students' involvement. The sample was randomly divided into two groups, an intervention group composed of 12 teachers, aged between 25 and 56 years (M = 35.38; SD = 7.71) and 113 students, aged between 18 and 28 years (M = 20.53; SD = 2.42); and a control group consisting of 12 teachers, aged between 25 and 44 years (M = 35.11; SD = 5.79), 107 students, aged between 18 and 39 years (M = 21; SD = 3.68). Quantitative and qualitative data were collected on the motivating interpersonal style, satisfaction of basic psychological needs, academic motivation and student involvement. The results demonstrate in general the effectiveness of the intervention on the perception of autonomy support to improve student involvement; this relationship is mediated by the improvement of psychological needs and academic motivation. The results are discussed around the recommendation of motivational strategies that the higher education teacher should implement to promote students' involvement.

Keywords: self-determined motivation; basic psychological needs; interpersonal style; university students

1. Introduction

Globally, most countries are actively advancing in response to the transformational demand that the higher education context has been facing for the last two decades [1,2], with the goal of improving the quality of academic processes and achieving high-quality accreditation [3]. Therefore, the transformation of higher education institutions (HEIs) is recognized as the epicenter of innovation, technology and human capital, which have been expressed in the transmission of applied knowledge within the framework of interaction processes with the external sector [4], which facing the challenges of the global economic context, requires both academic excellence and the development of positive psychological capacities and the search for competitive advantages [5]. In this process, dropout and student academic performance, as basic conditions for quality [6], are two key aspects to consider in the approach to understanding the personal and social variables involved in the motivational processes that determine the student's involvement. In this scenario, the Self-Determination Theory (SDT, [7]) is an inescapable frame of reference [8]. The SDT points out that a teacher's motivating interpersonal style practices oriented at promoting intrinsic motivation should focus on satisfying the basic psychological needs of autonomy, competence and relationships with others [9], which call for results, such as academic involvement of students [10–12] and their motivation to learn, regularly attend classes and participate in academic activities [13]. Therefore, the need arises from universities and teachers themselves to find useful tools to provoke positive changes in the students' attitudes towards their academic training. Based on the evidence that shows the benefits they

have on motivation and academic involvement, and ultimately the quality and academic success, the implementation of teacher's motivating interpersonal style focused on the mobilization of the student's internal resources is significant [14].

1.1. Importance of the Teacher's Motivating Interpersonal Style

The SDT's purpose is to understand the volitional nature of behavior through the influences of context triggers, as well as the result of the perceptions that the person makes about that influence [15]. Thus, it suggests that there are three basic psychological needs related to motivation: autonomy, which involves volitional aspects and the organization of behavior based on activities consistent with the integrated sense of self, in which individuals feel they can choose and have some control over the consequences; competence, which refers to the individual's perception of feeling capable and effective when performing her tasks; and the relationship with others, which refers to the need for people to get involved with others in a meaningful way and feel part of a group or a collective in general through the establishment of links [7]. According to the SDT, the teacher's motivating interpersonal style is understood as the form of interpersonal behavior that the teacher manifests during interaction with his students [16]. The motivational style can have a decisive influence on the results that students have in class. The motivational style is composed of a series of interpersonal relational skills, ranging from a controlling range to a range of autonomy support. Regarding teachers who promote autonomy support, this style is made up of the following aspects: 1. Provision of choice, 2. Structure and 3. Empathy in the perspective of positive affect in the relationship with others. However, the controlling style is associated with the teacher imposing his own rules on the students and using threats or pressure as frequent behavior with his students. The teacher's motivating interpersonal style can influence students' motivation, ranging from one that is more supportive or one that is more frustrating for their basic psychological needs. When these are satisfied, students report more motivation and involvement [17,18] and are more likely to deeply process the learning material, producing better performance [19], greater well-being [20], higher educational aspirations, persistence in educational pathways and lower levels of academic dropout [21]. That is, when teachers support the preferences of students in the pursuit of their personal interests and goals, they become more and better engaged in their learning process [22].

On the contrary, a controlling style, based on pressure and threats, can lead to action motivated solely by the fear provoked by punishment [23], which is associated with lack of involvement [19], loss of initiative and less learning [7].

This way, teachers become one of the main responsible for promoting satisfactory experiences in the classroom, as their work is decisive for the motivation of students [24].

Recent studies, such as those by Behzadniaac, Adachic, Deci, and Mohammadzadeha [25], Goldman, Goodboy, and Weber [26], Jeno, Danielsen, and Raaheim [27], and Yu & Levesque-Bristol [28], coincide in pointing out the importance of self-determined motivation as a key element for academic performance and learning. Previous research, based on the SDT, such as those referenced, has found that autonomy support is associated with positive results such as well-being and autonomous motivation. In particular, it has shown that teachers who use an autonomy support style through the promotion of psychological needs achieve greater engagement in their students. However, the controlling style, characterized in that the teacher imposes their own way of thinking, feeling and acting, has been associated with negative student performance expressed in poor academic performance. Conversely, the autonomy support style takes into account the perspective of the students, their preferences and interests. In the controlling style, even the language itself is characterized by imposing expressions, such as "got to," "must" or "have to," lacking sense and argument that supports the desired behaviors. Correlational studies have seen the importance of addressing autonomy support. Additionally, in observational studies [29], autonomy support has been evaluated in terms of rank typology through frequency scores, with qualitative scores taken from extracts of classes recorded on video [30,31]. However, qualitatively based observational studies are

not common. Based on this analysis, it can be considered that the success or failure in the academic experience of the students is subject to the teacher's motivating interpersonal style in the processes in higher education, which will highlight the self-determined motivation of the students and their academic involvement [22].

1.2. Teacher's Motivating Interpersonal Style and Student Involvement

According to the SDT, involvement is a reflection of the positive development of an individual and is a key element for retention, persistence [32,33] and academic success [15]. In this sense, the teacher's motivating interpersonal style of autonomy support, by satisfying the basic psychological needs of students, contributes to improving academic involvement, defined as the level of effort that students dedicate to their learning, and that brings positive consequences, such as performance and well-being. It also states that involvement is a state influenced by contextual factors [34]. This way, autonomy support practices are associated with greater academic involvement [10], as they have a significant positive impact on the regulation of autonomous learning. Perceiving autonomy seems to be an important predictor of academic involvement [35], although structure, related to the sense of competence, is also another key element for it. However, while autonomy refers to the degree of freedom that teachers allow their students to self-determine in the development of classes, structure refers to the clarity and quantity of information provided to students regarding how to achieve the objectives proposed in the classroom [14,34].

Recently, Xu, Chen, and Chen [36] analyzed various studies and proposed that involvement can be behavioral, cognitive or emotional and that in any case, this is a key factor for academic success, predicted by the satisfaction of basic psychological needs through the provision autonomy support and structure in the classroom.

1.3. The Present Study

Aware of the importance of the role of the teacher in the academic success of students in higher education [37] and its impact on the academic involvement assumed by students [38], the present study set out to examine the influence of an intervention based on the teacher's motivating interpersonal style of autonomy support on the involvement of the student through the motivational process suggested by the SDT regarding the analysis of the role of psychological needs and the student's academic motivation. The study tested three hypotheses. First, we proposed: (1) Students in the intervention group with autonomy support, compared with students in the control group, would report a longitudinal improvement in the satisfaction of their academic basic psychological needs. Hypothesis (2) was proposed that the students in the intervention group, in comparison with those in the control group, would report an improvement in autonomous motivation. Finally, hypothesis (3): The students in the intervention group, compared to the students in the control group, would report a longitudinal improvement in their academic involvement after the intervention.

2. Materials and Methods

2.1. Participants

The sample was made up of 220 Colombian university students (144 girls and 76 boys) of different levels of undergraduate academic programs in engineering, psychology, bachelor of education, law, social communication and architecture, at the Universidad de la Costa de Barranquilla, a private higher education institution, (37 in 3rd level; 22 in 4th level; 62 in 5th level; 29 in 6th level; 38 in 7th level; 13 in 8th level; 18 in 9th level). Their ages ranged between 18 and 39 years (M = 20.76; SD = 3.10). The participants were intentionally divided into an intervention group (n = 113), consisting of 59 men and 54 women, and a control group (n = 107), with 17 men and 90 women. Twenty-four university professors responsible for the study students (11 men and 13 women) of different levels and undergraduate academic programs from the same university, aged between 25 and 56 years (M = 34.83; SD = 7.55) also participated. The professors were intentionally divided into an intervention

group, which would be trained to teach their classes with a style of autonomy support (*n* = 12), made up of 5 men and 7 women, and a control group, which would use the model traditional class (*n* = 12), made up of 6 men and 6 women. To make up the intervention group, those professors who presented themselves to an open invitation to be part of a training course offered by the university were selected. The control group was made up of teachers who were invited to be part of an investigative process as a control group. The students participating in the study corresponded to those who had subjects enrolled in the semester in the courses of the teachers of both groups. In parallel, qualitative data were also collected and analyzed to complement and go into detail about the study of the variables contemplated in this research. After being informed of the objectives of the research, that the process would imply the completion of surveys at various times, and the recording of the classes on video, all the participants gave their consent. The selected sample ensured that the participants were from various semesters and academic programs.

2.2. Measurements

Autonomy support. To measure the motivating interpersonal style of autonomy support that the Higher Education student perceives from his teacher, the Scale of Autonomy Support by Moreno-Murcia et al. [39] was used. It consists of 12 items (e.g., "Provide explanations that help us understand the personal utility of carrying out this activity"), and the scale begins with an introductory heading such as: "My teacher in class … ". This is valued on a Likert scale from 1 (Totally disagree) to 5 (Totally agree). Internal consistency for take one was 0.92, and for take two, it was 0.93. This scale has shown reliability rates higher than 0.70 in previous works.

Controller style. To measure the controlling interpersonal style that the Higher Education student perceives from their teacher, the Controlling Style Measurement Scale by Moreno-Murcia et al. was used. [40]. It consists of 12 items (e.g., "It gives very few guidelines and no alternatives on how to carry out the tasks it presents"), and the scale begins with an introductory heading such as: "My teacher in class … ". This is valued on a Likert scale from 1 (Totally disagree) to 5 (Totally agree). Internal consistency for take one was 0.91, and for take two, it was 0.94. This scale has shown reliability rates higher than 0.70 in previous works.

Academic motivation. To measure student motivation, the version translated and validated into Spanish by Núñez et al. [41] of the Échelle de Motivation en Éducation (EME) (Vallerand et al., 1989) was used. It is preceded by the phrase "In this subject," and the responses are collected on a Likert-type scale that ranges from 1 (Totally disagree) to 5 (Totally agree). The internal consistency for the dimensions in take one: intrinsic motivation to knowledge (MIC) was 0.83; intrinsic motivation to achieve (MIL) was 0.78; intrinsic motivation to experience stimulation (MIEE) was 0.70; identified extrinsic motivation (MEI) was 0.72; introjected extrinsic motivation (MEIN) was 0.76; external regulation extrinsic motivation (MERE) was 0.77; demotivation (DESMOT) was 0.88. The internal consistency for the dimensions in take two: intrinsic motivation to knowledge (MIC) was 0.86; intrinsic motivation to achieve (MIL) was 0.87; intrinsic motivation to experience stimulation (MIEE) was 0.72 identified extrinsic motivation (MEI) was 0.87; introjected extrinsic motivation (MEIN) was 0.72; external regulation extrinsic motivation (MERE) was 0.69; demotivation (DESMOT) was 0.90. This scale has shown reliability rates higher than 0.70 in previous works.

Basic psychological needs. The Spanish version of the Échelle de Satisfaction des Besoins Psychologiques was used in the educational context [42] by Gillet et al. (2018). The scale was preceded by the statement "In my class … " and composed of 15 items referring to academic competence (e.g., "I have the feeling of doing things well"), academic autonomy (e.g., "I generally feel free to express my opinions"), and to the academic relationship with others (e.g., "I feel good with the people with whom I interact"). The answers were established on a Likert-type scale that ranged from 1 (Does not correspond at all) and 7 (It corresponds totally). The internal consistency for the dimensions in taking one

for autonomy was 0.75, for competence was 0.84, and for the relationship with the others, it was 0.82. On the other hand, the internal consistency for the dimensions in take two for autonomy was 0.77, for competence was 0.89, and for the relationship with the others, it was 0.90. This scale has shown reliability rates higher than 0.70 in previous works.

Implication. To assess the implication, the scale of Núñez and León [43] was used. It is made up of 12 items, which are scored on a Likert scale from 1 (Totally disagree) to 7 (Totally agree). Internal consistency for take one was 0.91, and for take two, it was 0.94. This scale has shown reliability rates higher than 0.70 in previous works.

Verification of the intervention. To assess the effectiveness of the intervention treatment, videotaped lectures were observed and analyzed by two expert evaluators in interventions with autonomy support. To do this, the Barrachina, Huéscar, and Moreno-Murcia [44] scale of observation of behaviors in support of autonomy was used, consisting of 4 categories and 25 subcategories, organized into 35 questions with a yes or no answer. The first and second categories had 5 subcategories and 5 questions each. The third category had 8 subcategories and 13 questions. The fourth category had 7 subcategories and 12 questions. The results obtained by rater 1 were used in the data analysis, while those from rater 2 were used to estimate inter-rater reliability. The internal consistency of the dimensions was 0.82, 0.91, 0.90 and 0.92, respectively, and the inter-rater reliability was 0.84.

Fidelity of the intervention. To assess the fidelity of the intervention, semi-structured interviews were carried out with only the teachers of the intervention group, as some studies have already carried out in advance [19,45]. The interview dealt with topics related to teacher satisfaction with the autonomy support instruction. A series of questions was carried out through focus groups: How would you define the role you have within the learning process of the students, your role? Did you have the opportunity to perceive that students expressed their perception regarding their teacher's motivating interpersonal style practices in the classroom? What did losing control and allowing the student to have it and be more self-determined mean to you? How did you experience this process? How do you think you are perceived by your students? How has it been the experience of feeling capable and facilitating students to also perceive themselves as competent and capable? In that process of perceiving yourself as capable of appropriating the tools, did you have any obstacles? How did they deal with them? How or in what way did they show that the students were transforming their way of being and being in class? How did you feel about the way of expressing yourself in the classes, going from being directive to more open? Speaking of motivation, what can we say about what motivates us in our work as teachers, as facilitators, as companions? Is the task of being a teacher worth it?
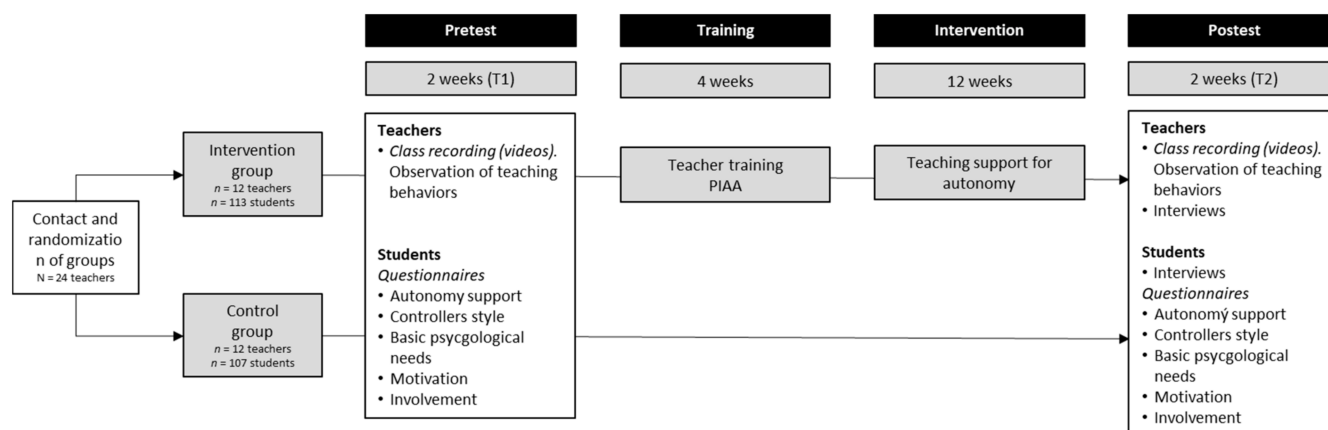
2.3. Process

This research was approved by the Academic Council and the Board of Directors of the main researcher's university within the framework of the CONV-14-2019 Call and was approved with the code INV.140-01-007-14 at the Universidad de la Costa (Colombia).

The procedural schedule for the implementation of the intervention is shown in Figure 1. The academic year in Colombia consists of 2 semesters per year (16 weeks in each semester, approximately 4 months). The present study was carried out during the second semester of the academic year through quantitative and qualitative measurements and analysis. At time 1 (week 4 of the 2nd semester), students completed the questionnaire package. Their responses were ensured confidential and used for research purposes only.

When the first data collection was completed, the teachers in the intervention group conducted training based on the trained autonomy support strategies, as shown in Figure 2, while the teachers in the control group taught their classes using their existing instructional objectives ("Teach as usual"). The intervention was carried out with twelve teachers and their groups of students in different subjects, between March and May 2019, in a total of one hundred and forty-four classes of 120 min, once a week, distributed over twelve weeks. At time 2 (week 14 of the semester), students completed the study questionnaire

a second time. At the end of the semester, individual semi-structured interviews were carried out with the teaching staff and the students of the intervention group. The content of the interviews was based on the results of the literature review that suggested key areas in supporting autonomy.

Figure 1. Procedural timeline for intervention with autonomy support and moments of data collection (T1 = Time 1; T2 = Time 2).
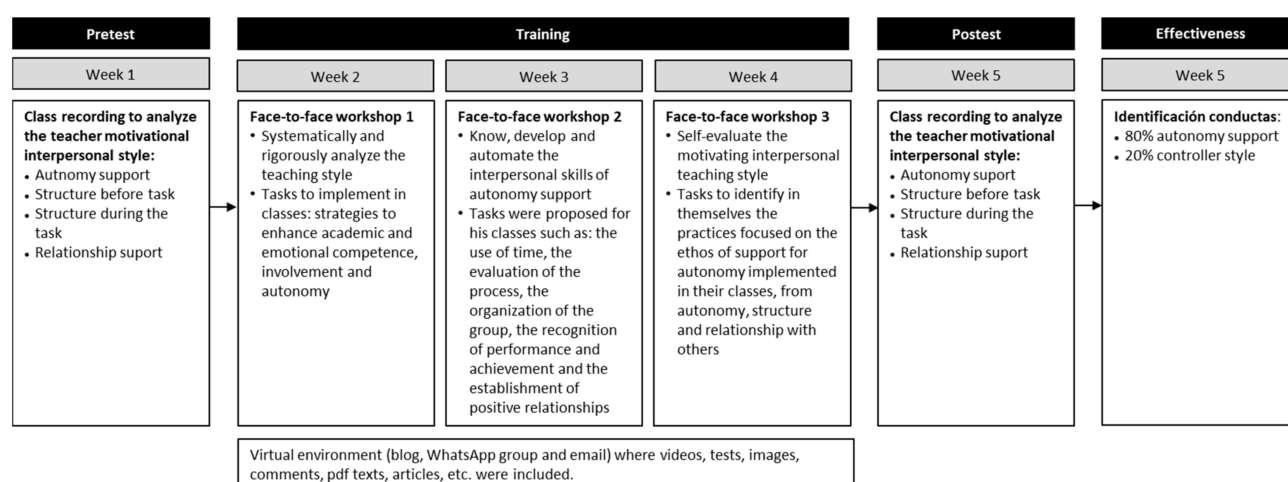
Figure 2. Training process in the Intervention Program with Autonomy Support.

They sought a detailed exploration of individual experiences and the meanings that these had for them [46].

To evaluate and control the effectiveness of the intervention, three classes of each teacher were filmed, between March and June, one before starting the intervention, another at the end of the training and a third at the end of the academic period. Two evaluators observed 10/15 min of a class period of each teacher in three moments (beginning, middle and end) of the semester.

Before implementing the study, the teachers of the intervention group voluntarily participated in a training workshop on autonomy support. In this workshop, participants were taught the concepts of motivation advocated in the SDT [47] and instructional behaviors to facilitate higher levels of autonomy support and reduce controlling style behaviors during classes [48–50]. Teachers completed the workshop, and measurements were made in a pilot study of four classes with students that had nothing to do with the present study. The purpose of the pilot study was to help teachers and ensure the correct application of each approach (autonomy support and control), and thus, achieve intra-observer reliability that was higher than 90%.

Descriptive analyses were executed to evaluate the teacher's interactions during classes, using the scale of measurement for the interpersonal style of Barrachina et al. [44]. According to some studies [51], which took similar measures, 80% or more of the interactions recorded using the teacher's interpersonal style should be directed to the autonomy of the intervention group. On the other hand, in the control group, 80% of the interactions must be characterized by the control style. In the present study, both groups obtained indices within those reported in the literature, as shown in Table 1.

Table 1. Frequency and percentage of interpersonal styles by group.

| | Moment 1 | | | | Moment 2 | | | | Moment 3 | | | |
| | Interv. group | | Control Group | | Interv. group | | Control Group | | Interv. group | | Control Group | |
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Autonomy suport	240	80%	48	16%	245	81%	45	15%	255	85%	36	12%
Controller style	60	20%	225	75%	55	19%	230	77%	45	15%	237	79%
Neutral style	0	0%	27	9%	0	0%	25	8%	0	0%	27	9%
Total	300	100%	300	100%	300	100%	300	100%	300	100%	300	100%

To avoid discrepancies between the study hypotheses and the practical reality, the students' perception of the interpersonal style used by the teacher (autonomy or control) was also measured. The objective was to obtain the students' perspective on the effects of the intervention. After performing the covariance tests, the effect of the intervention on perceived autonomy support was measured using the Autonomy Support Scale (ASS) and the Control Style Scale (CSS) (Figures 3 and 4). After the intervention, it was found that in the intervention group there were differences in autonomy support (M T1 = 4.19 and M T2 = 4.49; $p < 0.001$; $F_{(1,112)} = 22.65$; $d = 0.16$), and in the controlling style (M T1 = 2.84 and M T2 = 1.97; $p < 0.001$, $F_{(1,112)} = 44.08$; $d = 0.28$), with an increase in autonomy support and a decrease in the controlling style. In the control group, differences were observed in autonomy support (M T1 = 4.48 and M T2 = 3.61; $p < 0.001$; $F_{(1,106)} = 85.63$; $d = 0.45$), and in the controlling style (M T1 = 2.29 and M T2 = 2.04; $p < 0.01$; $F_{(1,106)} = 6.11$; $d = 0.05$), decreasing the two measures after the intervention.
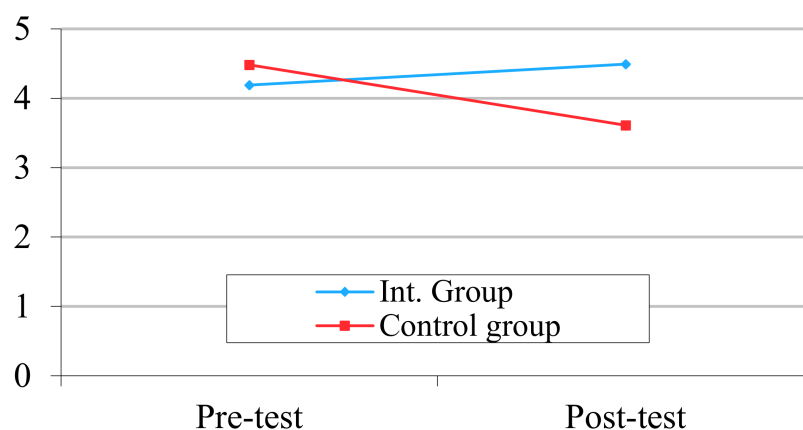
Figure 3. Students' perception of the teacher's motivating interpersonal style of autonomy support.
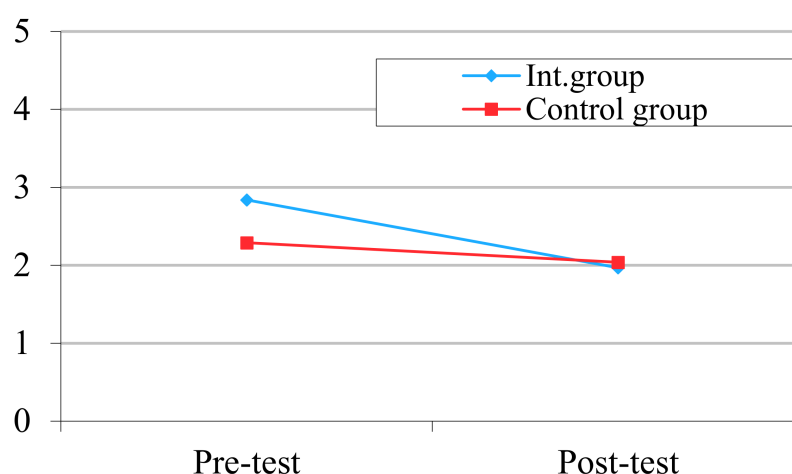
Figure 4. Students' perception of the teacher's controlling style.

2.4. Statistical Analysis

To analyze whether there were any differences between the control group and the experimental group in the study's target variables before the intervention, a Levene test was performed with the pretest variables of the groups. To answer the research questions, a repeated-measures analysis of variance (ANOVA) was performed.

Attending to Cohen, 1988, the effect size was calculated using his cut-off values for small 0–0.2, medium 0.2–0.5 or large 0.5–0.8. The internal consistency of each factor was analyzed using Cronbach's alpha coefficient. The data were analyzed using the SPSS 25.0 statistics program. Interpretive phenomenological analysis (IPA) was also used [52]. A content analysis [53,54] of the two sets of interview transcripts was used. Once the interviews were transcribed, they were read in-depth, and the information was categorized, following a constant process of comparison and inductive logic reasoning, as suggested in various research qualitative methodology manuals [55–57]. Thus, the analysis consisted of classifying all the information collected in the interviews into a system of categories and subcategories that simplified, clarified and related the information, giving meaning to the data. The results were analyzed according to the centers of interest and categories.

3. Results

The analysis of the data is presented below from two perspectives. On the one hand, in a quantitative way and on the other, in a qualitative way.

3.1. Quantitative Analysis

First of all, to verify the homogeneity of the two groups before the intervention, an analysis of variance was carried out with one factor, considering as dependent variables (autonomy support, controlling style, basic psychological needs, motivation and involvement) and as fixed factor (the group) finding differences (Wilks Lambda = 0.90, $F_{(16,203)} = 5.35$, $p < 0.01$, $d = 0.29$), in the controller style variables ($F_{(1112)} = 26.19$, $p < 0.01$, $d = 0.10$) and controlling motivation ($F_{(1112)} = 7.31$, $p < 0.01$, $d = 0.03$), in favor of the intervention group; and in the variables autonomy support ($F_{(1106)} = 17.93$, $p < 0.01$, $d = 0.07$), competence ($F_{(1106)} = 11.52$, $p < 0.01$, $d = 0.05$), relationship with others ($F_{(1106)} = 8.54$, $p < 0.01$, $d = 0.03$), autonomous motivation ($F_{(1106)} = 39.13$, $p < 0.01$, $d = 0.15$), controlling motivation ($F_{(1106)} = 23.33$, $p < 0.01$, $d = 0.09$) and implication ($F_{(1106)} = 23.18$, $p < 0.01$, $d = 0.09$), in favor of the control group.

To verify the effect of the pre and post intervention, both in the control group and in the intervention group, the repeated measures analysis was performed, considering the initial differences that were obtained in all measures. This statistical test allows to control these differences and observe the possible effect that the intervention had, as reflected in the results. When verifying the effect of the program through the analysis of repeated

measures (Table 2), significant differences ($p < 0.01$) were obtained in the intervention group, probably due to the lack of randomization in the allocation of units [58]. The values in the variables autonomy, relationship with others, autonomous motivation and involvement improved, and they decreased in controlling motivation. Conversely, in the control group, significant differences were found ($p < 0.01$) in the variables autonomy, autonomous motivation, controlling motivation and involvement, decreasing the values in T2.

Table 2. Analysis of repeated measures.

		Intervention Group (*n* = 113)		Control Group (*n* = 107)	
		M	*DT*	*M*	*DT*
Autonomy	Pre	3.84	0.76	3.95	0.72
	Post	4.28 **	0.63	3.41 **	0.85
Competence	Pre	4.30	0.59	4.55	0.46
	Post	4.60 **	0.57	4.48	0.50
Relationship with others	Pre	4.05	0.67	4.32	0.70
	Post	4.49 **	0.64	4.36	0.67
Autonomous motivation	Pre	5.42	0.77	6.32	0.63
	Post	5.86 **	0.74	5.48 **	0.73
Controlling motivation	Pre	4.51	0.83	4.22	0.77
	Post	3.68 **	108	3.72 **	0.68
Involvement	Pre	5.50	1.00	6.09	0.78
	Post	5.92 **	0.88	5.44 **	0.80

Note: ** $p < 0.01$.

3.2. Qualitative Analysis

In order to complement the measures obtained through quantitative information, a focus group was conducted with a sample of students who participated in the process, both from the control group and the intervention group. The purpose of the meeting was explained to them, and once they agreed, they were asked to sign the informed consent. They were randomly selected, but their time availability was taken into account. The dynamics took place for about 45 min, with the facilitation of the principal investigator. Open questions were posed, aiming at delving into central aspects of the research such as the student's perception of their teachers in relation to their ways of relating and conducting the class, emphasizing the opportunity they have or not to make decisions, make proposals, disagree, participate, interact during class, develop tasks, perceive themselves competent and satisfied.

In the same sense, a focus group was conducted with a sample of the teachers, randomly selected, who participated in the process. The dynamics were also facilitated by the principal investigator. Although open questions were designed, there was also an opportunity to generate other questions derived from the development of the activity. Both of them were oriented to deepen into central aspects of the investigation.

For the interpretation and analysis of the results derived from the qualitative measurement instruments, processes similar to those of other studies [59,60] were carried out, following the methodological indications of Hsieh and Shannon [61]. In the analysis of the videos, in particular, it was proposed to distinguish the different behaviors and statements of the teachers according to how they approximate a teacher's motivating interpersonal style of control, autonomy support or neutral [62].

3.2.1. Student Interviews

After advancing the focus group with the students and analyzing the information, everything was structured into three categories and five large blocks or subcategories, as

shown in Table 3. The three categories correspond to teachers, the second to goals and the latter for purposes. As for the subcategories, they are condensed in a first block on the "style of autonomy support" by the teacher; a second block on "high self-determined motivation;" a third on "competence;" a fourth on the "relationship with others;" a fifth and last block on "well-being."

Table 3. Category and Subcategory System after Student Group Data Analysis (Posttest).

Categories	Subcategories	Codes
Teacher	Autonomy support style	Controller
		Autonomy support
		Both styles
Goals	Autonomy	I can make decisions during classes
		I can make proposals during classes
	Competence	I have received guidance from the teacher
		I have been able to understand the issues
		Homework is affordable
	Relationship with others	When I do work with my colleagues I learn more
	High self-determination motivation	Maintaining a high involvement
Effects	Psychological well-being	I feel good in my classes and I feel like I am learning
		I like my career and I want to move on

Autonomy support style. It becomes palpable that the professor's respectful, close and kind attitude with his students is considered relevant, as well as his openness and trust since it facilitates not only the recognition of the professor as an expert but also the assessment of his qualities as a person. On the other hand, it facilitates the learning process because it allows a greater understanding on the part of the students, since, in addition to being structured within the framework of a clear and pleasant language, it allows the formulation of questions and answer alternatives. An example of a statement is: "I believe that one takes more confidence with her, it is easier to ask her, we continue to see her as a person who has knowledge and who knows" (E2).

Autonomy. The possibility of choosing between alternatives, proposing and being able to make decisions was key for the students, as it promoted participation, involvement and interest in the development of the subjects. Some expressions collect this experience and give proof of it: "The teacher gives us several solution options, several alternatives" (E2).

Competence. Perceiving themselves as capable and competent represented for the students a fundamental element in their training process, which, added to a close relationship with the teacher and the opportunity to decide, led them to commit even more to their process. In the following expression, the scope of this aspect is evidenced in the words of the students: "(the teacher) first explains the importance and then explains the process how it is done, and then leaves us free development" (E2). In contrast, the control group students recognize the complexity of the subjects and the limitations they have to assimilate them: "it really is difficult. There are ugly subjects and the teacher does not help, he does not present them easier and I feel bad and worse if I lose the exam, because I see that I am not learning" (E2GC).

Relationship with others. Collaborative learning, meeting with peers and the establishment of open, dynamic, reciprocal and respectful relationships promote an appropriate environment for learning and are considered a very important factor by the students in the classroom. The following are some of the expressions that reflect this feeling in the students: "I think the relationship with my classmates is important. I feel that with them I can talk about my things and learn more" (E1).

High self-determined motivation. It is observed that although the grades are important, they are not more important than the fact of learning, to the point that there can

be satisfaction, even when they are not very good or even insufficient. This motivation allowed the students to attend classes with greater regularity and a willingness to learn and grow as professionals in training and as individuals. Here are some expressions that reflect this dynamic: "I never missed that class, I always kept motivated because I am really learning" (E3 Wellness.); or "I am mainly motivated by the desire to grow personally and professionally" (E4).

For the student, feeling good, full and finding personal well-being is presented as a key within their entire educational journey. The teacher is recognized as an important "partner" on this path, but he is also the student as an active subject and agent of the process. This experience of well-being is reflected in expressions such as "We are motivated to continue, make us want to do it again" (E1); "And you also say I got it, because one also needs personal satisfaction and not to say I did it wrong again" (E2); "I am satisfied with my life, we always want more because we are a little ambitious" (E4). Meanwhile, the control group students agree that they feel good when they win the subject and simply pass the level.

3.2.2. Teachers Interview

After the intervention process, the focus group was carried out with a sample of teachers. Once this was concluded, the information was analyzed. It was structured into three categories and five large blocks or subcategories, as shown in Table 4. The three categories correspond to teachers, the second to goals, and the last to effects. As for the subcategories, they are condensed into a first block on paper in the classroom focused on autonomy support, a second block on motivation, a third on competence, a fourth on the relationship with others and a fifth on satisfaction.

Table 4. System of Categories and Subcategories after the Data Analysis of the Group of Teachers (Posttest).

Categories	Subcategories	Codes
Teacher	Role in the classroom centered on Supporting Autonomy	Controller
		Autonomy support
		Both styles
Goals	Autonomy	Decision-making during classes
		Proposals during classes
	Competence	Orientations to students
		Facilitation of understanding of topics
		Approach affordable tasks
	Relationship with others	Facilitation of teamwork for greater understanding
	Motivation	Promote high engagement
Effects	Satisfaction	Promote well-being in classes for greater learning
		Promote appropriation by career and permanence

Role in the classroom focused on autonomy support. Teachers recognize that they are facilitators of the student's learning processes through the practice of the motivating interpersonal style of autonomy support. They live an experience between guiding and letting them go: "I believe that this exercise that we did during this semester for me was to confirm the role of facilitator especially at this educational level."

Autonomy. Within the framework of the classroom process, in addition to recognizing themselves as facilitators, teachers consequently recognize students as agents responsible for their learning. They are given the possibility to choose, ask, dispute and propose: "the student is responsible for their learning, for me the student has to assume to assume, I feel that this time I had students who, even though their grades were not 5, they appreciated the possibility of stimulating decision-making, the possibility of thanking us for indicating

that we are responsible for this" (P1). In contrast, in the focus group that went ahead with the teachers of the control group, different views were observed regarding the emerging subcategories in the intervention group. Conceptions focused more on control and reflected in expressions such as "students have to conform to what is established, to the rules of the game so that the class functions" (P1GC) denote this.

Competence. In this facilitation process, teachers recognize that they must accompany students along a path that must become more complex in such a way that they feel progressively competent and capable of moving forward. For this reason, it is not enough to enable a close relationship or a scenario of autonomy, but also of competition: "the fact that the student is autonomous, that the student decides that is his responsibility, is also accompanying him to the side, neither behind nor forward, if not to the side" (P1).

Relationship with others. In this process, the teachers also realized that it is not enough for them to facilitate, guide and promote; it is not even enough that students take ownership. They realized that the relationship between students, as peers and classmates, is essential to achieve learning. The teachers are aware of this, and they also insist on proposing didactics and pedagogies that stimulate this relationship: "There was a student who did not know how to interpolate so I stayed with him and taught him and then he was the one who explained to the classmates who did not understand" (P6). Even as a result of this relationship with others, a transformation occurred to the point that the student "is capable of leading his classmates" (P1). On the other side, although the teachers of the control group established harmonious relations with their students, there is a distance that does not make them warm and close: "I am close to the students, but they there and I here" (P2GC).

Motivation. It was a central component in the process, since as far as the student was concerned, it was a consequence of achieving competence, autonomy and relationships with others, starting from the teacher's motivating interpersonal style of autonomy support, and regarding the teacher, an engine for the development of their role in the classroom. Both elements are combined and enriched as expressed by the teachers "my motivation is to see the transformation of the student, it satisfies me and in fact that is why I am here" (P5); "The growth of my students motivates me" (P7).

Satisfaction. Throughout the experiential journey, the teacher finally expresses a vocational theme. He is not only a teacher for a job, for an income. It is a matter of will, desire and a life project that seeks personal fulfillment and also to the students, and translates into satisfaction and well-being, which was also experienced by the students. This is how the teachers express it: "I feel that I enjoyed the process, because it was like getting out of neutral and doing something different" (P5); "We enjoyed it and the students too" (P7). "I think it is important to leave traces (. . .) and it is satisfactory to be able to help him a little in the life of that student" (P6): "For me it was satisfactory, I also felt that I grew as a teacher that my students were motivated" (P3).

3.2.3. Analysis of the Videos

The three dimensions of the teacher's motivating interpersonal style (control, autonomy support and neutral) were analyzed, both in the intervention group and in the control group, through the review of the class recordings throughout the process, taking as a guideline what is proposed by Pearlman [46], who considers a predominant dimension one that occurs in 80% of the behaviors observed. As presented in Table 1, in more than 80% of the interactions of the teachers in the intervention group, the teacher's motivating interpersonal style of autonomy support predominates. Similarly, in the control group, 80% of the interactions were characterized by a controlling style. These findings confirm the suggested hypothesis that the intervention group would obtain a more positive result in the measures of the variables.

4. Discussion

The objective of this study was to evaluate the effect of an intervention with autonomy support on the involvement of college students, taking the framework of the SDT as a reference and from a quantitative and qualitative analysis perspective. After the intervention, the results showed that the Intervention Program with Teacher Autonomy Support achieved, in general, more adaptive behaviors in university students. In turn, it is qualitatively supported by the analysis derived from both the focus groups and the videos taken throughout the intervention.

The intervention had a positive effect because the students who received greater autonomy support presented a greater satisfaction of basic psychological needs [45,63]. These results coincide with previous studies and confirm that the use of the teacher's motivating interpersonal style of autonomy support favors improvements in student motivation [19,20].

The social context and relationships have a significant impact on basic psychological needs and well-being, being able to enhance or affect them [15], and are key to the influence that teachers have on student motivation [64]. This way, the more the teachers implement a motivating interpersonal style of autonomy support during their classes, the greater the student's involvement, levels of autonomy, competence, relationship, self-determined motivation [65] and involvement [22,34,35]. As a consequence, the closer and gentle treatment of the teacher with his students has been key since he has built trust and openness for meeting and discussion in classroom spaces.

Strategies of educational autonomy support that stimulate the development of self-determined motivation can lead students to become more engaged in their academic activities [38]. Satisfying the psychological needs of competence, autonomy and relationships with others through the implementation of strategies that promote the use of a style of autonomy support in the classroom, which for the present study were 25 (Table 5) and were implemented according to the quasi-experimental study protocol of Moreno-Murcia et al. [66], self-determined motivation was improved in the students, in the same sense explained by Núñez and León [43]. The predictive power of the interpersonal style of autonomy support over improvement in academic competence was also observed [67,68].

Table 5. Strategies for the interpersonal style of autonomy support [66].

Context Description	Autonomous Strategy
During the class, when the teacher proposes a teaching–learning situation . . .	Ask the student about their preferences in relation to a task.
In the development of the class, the teacher when set the tasks . . .	Offers the possibility of choice to the student (groups, materials and spaces).
In the approach of the tasks, on the taking of student decisions about their intervention, the teacher . . .	Let the student take the initiative (gives the initiative).
The teacher, on the possibility of consolidation, expansion or reinforcement of objectives pursued with homework . . .	Offers possibilities for experimentation (individualizes the teaching).
The teacher, when organizing tasks, manifests expectations towards the group so that . . .	Assigns responsibility by stating its positive expectations and confidence that It will come out well.
Regarding the information that the teacher gives the students before starting a task . . .	When starting the task, explain and relates it to Class objectives.

Table 5. *Cont.*

Context Description	Autonomous Strategy
Before starting the practice, the teacher, on the possibility to locate that task within the class structure . . .	Locate the task within the class structure (organization).
The teacher offers arguments about the social transfer that has the realization of a activity . . .	Explain the usefulness of homework.
The teacher, when he needs to illustrate before starting, class . . .	He relies on students as positive role models to demonstrate.
When a task is presented, on the possibility of guiding on personal improvement with criteria for the student, the teacher . . .	Does so by offering guidelines and orientations to regulate personal progress and makes the criteria for improvement known in advance.
The teacher during the execution of the activities . . .	Adapt directions based on student progress.
When the teacher needs to illustrate the tasks once they have started . . .	Use role models through students.
On whether the teacher participates in the explanations of the tasks . . .	When necessary, share the demonstrations with the students.
On the variants that the teacher can offer during the development of a task . . .	Remember the different variants for the same task.
During the performance of the tasks, the teacher . . .	Offers both verbal and non-verbal positive reinforcement. Encourage students to persevere.
The teacher, during the development of the activities, . . .	Offers informative and/or positive feedback during the execution of tasks
The teacher usually raises the activities in such a way that . . .	Offers a graduation of the difficulty of the tasks according to the level of the students.
During the activities, the teacher . . .	Proposes flexible groupings according to the development of the tasks.
During the development of the session, the teacher . . .	Addresses students with education and on an individual basis.
When students talk to the teacher, the teacher . . .	Uses empathetic language.
The teacher during the development of the class . . .	He approaches the students to attend to them.
The teacher when interacting in class . . .	He is enthusiastic.
The teacher during the development of the class . . .	Gives confidence to the students.
The teacher during the development of the class . . .	Behaves as a positive role model for students.

The need to establish the importance of the basic psychological needs of autonomy, competence and relationship with others is evidenced in order to create learning environments focused on a style of autonomy support that is conducive to improving and maintaining the involvement of students [38,68] and, depending on this, its permanence, persistence and academic success [32,33]. Therefore, on top of a good relationship with their peers, the possibility of students to choose and propose impacts on involvement, adherence to learning processes and satisfaction with life. In addition, when the students

perceive themselves capable in this process, their well-being, performance and motivation increase overall.

This study makes contributions to pedagogical nature, demonstrating the importance of implementing strategies to enhance student motivation and their involvement in academic processes. This way, to allow the choice of content among different options, offer level options in the tasks, facilitate teamwork and active participation within the framework of close relationships in class, guide students in the construction of knowledge and searching for answers within a non-controlling language and autonomy support framework are key strategies to consolidate greater motivation and involvement in students [45,69]. Likewise, the establishment of a pleasant and empathetic language is a determining component that translates into a clearer learning process, with greater understanding and greater possibilities of horizontal interaction. On the other hand, the results suggest promoting a much broader and more diverse university teacher training, focused not only on a deep specialization and experience in an academic and research area but also on the mastery of effective teaching-learning strategies focused on the teacher's motivating interpersonal style of autonomy support [11].

Among the limitations of the study are the need to increase the intervention time and the inclusion of other variables of analysis such as resilience, self-concept and satisfaction with the student's life, verifying the transcontextual effects of the benefits of implementing a support style to autonomy in class. Another limitation is that it only focuses on academic involvement as a result of supporting autonomy. Involvement is one of many possible behavioral outcomes derived from mobilizing the student's internal resources. Future works should complement this preliminary data with information provided by other expected consequences of this style of an emotional, cognitive or behavioral nature. Among the limitations, it is also found that by not having used an active control group, it will be necessary to take it into account in future studies, since the differences obtained in the present work presume that there may be other variables not analyzed that could have modified the results. Regarding the practical implications, although these results are presented as preliminary, we think that this research may contribute to a better understanding of how the educational system can contribute to improving the academic results of students thanks to teacher training in more adaptive styles. Thus, we suggest, aligned with other research, that teacher training programs aimed at modeling interpersonal behavior with their students be promoted. In our study, we have verified how through this monitoring, the teacher who focuses his work on guaranteeing student decision-making, supervising the learning process during the execution of tasks and supporting social relationships, manages to improve motivation towards proposed activities and finally the student decides to sustain a greater involvement and sustained interest towards them.

Finally, it is considered that sustainable development is only possible when different work fronts are integrated, as proposed by the UN in the Sustainable Development Goals [70] and in particular, in objective 4 Quality Education, in which it raises the challenge of having qualified teachers who accompany students on the path of relevant and effective learning that allows them to access a decent job or entrepreneurship, which in turn contributes to sustainable development.

5. Conclusions

This research joins a growing research force that, from the SDT, combines quantitative techniques with the information provided by qualitative techniques to achieve a better knowledge of the variables that participate in a quality educational context from teacher training. This study suggests that in order to achieve greater academic involvement of students, teachers should first be able to mobilize their academic motivation by promoting psychological mediators, minimizing the use of controlling behaviors. Therefore, it is necessary to train teachers in structured programs that help them implement these strategies in their classes to achieve the expected results.

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