Psicothema

Psicothema 2020, Vol. 32, No. 4, 525-532
doi: 10.7334/psicothema2020.189

ISSN 0214 - 9915 CODEN PSOTEG

www.psicothema.com

Personal and Instructional Variables Related to the Learning Process in Postgraduate Courses

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Abstract

Background: The aim of the present study was to analyze the relationship between different student characteristics (gender, reason for choosing the master's degree and specialty), the instructional context (perceived quality of the instructional process), and the characteristics of the learning process (practical learning strategies and study approach) in postgraduate study. **Method:** 621 students completed the Motivated Strategies for Learning Questionnaire, the Inventory of Study Processes, the Inventory of Self-Regulatory Learning Processes and a questionnaire developed ad hoc about instructional processes. **Results:** The data indicates notable differences between men's and women's involvement in their postgraduate study. Furthermore, the results also suggest that it is only when postgraduate courses are done for vocational reasons and students receive quality instruction that the two factors ensure students prioritize deep learning processes (e.g., significant learning, reflections on meaning, comprehensive learning) versus a surface learning approach. (e.g., memorization, lack of reflection). **Conclusions:** The results may be of interest for the design of postgraduate university education policy in relation to the selection processes for both students and teachers.

Keywords: Learning strategies, study approaches, quality of the instructional process, motivation, gender, postgraduate studies.

Resumen

Variables Personales e Instruccionales Relacionadas con el Proceso de Aprendizaje en los Estudios de Postgrado. **Antecedentes:** en el presente estudio se pretendió analizar la relación entre diferentes características del estudiante (género, el motivo de la realización del máster y la especialidad realizada) y del contexto instruccional (percepción de la calidad del proceso instruccional recibido) y las características del proceso de estudio (estrategias de aprendizaje utilizadas y enfoque de estudio) en los estudios de postgrado. **Método:** 621 estudiantes contestaron al Motivated Startegies for Learning Questionnaire, al Inventario de Procesos de Estudio, al Inventario de Procesos de Autorregulación del Aprendizaje y a un cuestionario construido ad hoc sobre procesos instruccionales. **Resultados:** los datos obtenidos muestran diferencias importantes en la implicación de hombres y mujeres en su formación de postgrado. Asimismo, también sugieren que únicamente cuando se accede a los estudios de postgrado por motivos vocacionales y, una vez dentro, se tiene lugar un proceso instruccional de calidad está garantizado que los estudiantes prioricen procesos de aprendizaje profundo (e.g., significativo, comprensivo) sobre el uso de un enfoque de estudio superficial (e.g., memorístico, sumativo). **Conclusiones:** se concluye que los resultados obtenidos pueden tener interés para el diseño de la política educativa universitaria de postgrado, de cara al proceso de selección tanto de los estudiantes y como del profesorado.

Palabras clave: estrategias de aprendizaje, enfoques de estudio, calidad del proceso instruccional, motivación, género, estudios de postgrado.

Data from the Organization for Economic Co-operation and Development (OECD, 2018) indicate that Spain (together with France, Italy, and Portugal) has a high proportion of higher qualifications (bachelor's, master's, and doctoral qualifications). However, according to the most recent report from Conference of Rectors of Spanish Universities (CRUE, 2019), Spain has a lower proportion than the European Union (26% as opposed to 30%), lower than the OECD average (31%), and considerably lower than the United States of America and the UK (36%). In addition, according to the OECD (2018), the academic performance of the Spanish university system is comparable to or even better than university systems in other developed countries, only behind five of the 22 countries examined: The UK, Ireland, Israel, Japan, and South Korea. Even so, there is a certain concern about the high proportion of students who drop out of their courses, particularly at undergraduate level (Sáez et al., 2020).

When it comes to master's degree courses, although they provide more specialized training to students, there is little information about how that training happens, both in terms of the teaching and learning processes. While we expect students at this level to be mature, autonomous, and effective managers of their own learning processes (Morales-Vives et al., 2020), we do not know whether they are sufficiently prepared for this complex task (Shukr et al., 2013). Some researchers (e.g., Coates & Dickinson, 2012; Kaur & Sidhu, 2009) suggest reporting on the various problems and

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multifaceted challenges postgraduate students face, which could help shift the blame from students for failure in postgraduate study and help advance towards a more democratic vision of education, allowing a more objective view of the learning environment, its potentials, and its difficulties.

It is possible that the quality of the knowledge and skills gained by postgraduate students is due to the particular characteristics of the individual teaching processes in these courses. In this regard, Rosário et al. (2013) considered whether the instructional approaches used by the teachers were associated with the way students approached their study, and whether students' study approaches mediated the relationship between the teachers' instructional approaches and academic performance. The answer they found was yes to both questions. Specifically, the more that teaching was student-centered, the more students used deep study approaches and the less they used surface approaches, and the better their academic achievement. The authors of that study recognized that this relationship between teaching and learning was weak, and consequently they invited continued research into the reasons why the link is not stronger (which would be logical).

However, a deep approach to study does not always lead to good academic results, as a recent multilevel study with 3626 Danish university students showed (Herrmann et al., 2017). In that study, they found that good academic results were linked to less use of surface approaches, but not to greater use of deep study approaches. Moreover, in some studies, no relationship has been found between the type of teaching, the students' learning styles (e.g., Riveros-Pérez et al., 2019) and academic performance (e.g., Cimermanová, 2018). In short, as some studies have indicated (e.g., Samarakoon et al., 2013), the relationship between teaching and learning processes may be different between undergraduates and postgraduates.

The adoption of one type of learning strategy over another depends not only on the teaching requirements, but also on students' personal variables. Although the use of one strategy or another when learning has been shown to be related to variables of intelligence and personality (Lipnevich et al., 2016; Miñano et al., 2012), to specific skills related to learning tasks (Kostons et al., 2012), and to knowledge of effective use of learning strategies and self-regulation (Trevors et al., 2016), etc., the two variables that have most weight in the choice of strategy are the type of motivation and perceived competence (Abín et al., 2020; Cerezo et al., 2019; Gilar-Corbi et al., 2019). In addition, gender seems to be an important variable in both undergraduate and postgraduate students which is associated with individual differences when it comes to using learning strategies (Romero et al., 2018).

In terms of gender, according to the results of most studies that have examined this variable (e.g., Cano, 2000; Romero et al., 2018), women score significantly higher than men in learning strategies related to study and learning processes that are significant, thorough, and deep (e.g., intrinsic motivation, task value, use of elaboration, organization, and metacognition strategies). However, a recent study did not report these gender differences (Sahin & Özkan, 2020).

In terms of the type of motivation, according to the results of previous studies about the relationship between motivation, learning, and performance (e.g., Díaz Mújica et al., 2019; Hammoudi, 2019; Pastor et al., 2007; Valle et al., 2003, 2009, 2015), in comparison with students who primarily study for more instrumental reasons (e.g., passing a subject, finding a job), students who study primarily for reasons related to learning, training, and mastery score higher in learning strategies related to significant, deep learning, higher in the use of deep study approaches, and higher in the use of self-regulated learning strategies.

Although there is more to it, it seems that the results of learning (skills, knowledge, attitudes) are largely dependent on the cognitive, metacognitive, and emotional processes the student employs when working on a task (memorization, organization, and elaboration) (De la Fuente et al., 2010, Jerónimo-Arango et al., 2020; Roces & Sierra, 2017; Rosário et al., 2013). However, it is also clear that the student using one process or other, or using it more thoroughly or less, also depends to a certain extent on the instructional processes that the teachers use (the elements –tasks, content, evaluation, and the process itself– which allow the construction of knowledge, which allow for it to be retained, etc.) (Rosário et al., 2015), along with other student variables such as the reasons driving deeper or shallower involvement in these types of tasks (e.g., vocational, instrumental, etc.) (Hammoudi, 2019; Valle et al., 2003, 2015), and gender (Cano et al., 2000; Rodrigo et al., 2018).

Consequently, the objective of this study is to analyze the relationship between different student characteristics (i.e., gender and reason for doing their postgraduate study), the instructional context (i.e., perception of the quality of the instructional process), and characteristics of the study process (learning and self-regulation strategies used, and the study approach) in postgraduate study.

Based on the results of previous studies, we hypothesize that (1) women will score significantly higher than men in strategies related to processes of deep study and deep, significant learning (e.g., intrinsic motivation, task value, and the use of elaboration, organization, and metacognition strategies); (2) students who are doing master's degrees for vocational reasons, compared to those doing them for instrumental or other reasons, will score higher in strategies related to a deep study approach, and significant, self-regulated learning; (3) there will be statistically significant differences in the use of learning strategies, study approach, and use of self-regulation strategies between the different groups according to their perception of the quality of the instructional process. More specifically, we expect that the higher the perceived quality of the instructional process, the greater the use of learning strategies related to deep study and learning and greater autonomy.

Method

Participants

In the study, 621 postgraduate students (58.8% women) took part from four Spanish universities (242 from the University of Oviedo, 182 from the University of León, 151 from the University of A Coruña, and 46 from the University of Cantabria). The students were aged between 20 and 53 years old (M = 26.43, SD = 5.57). Only 37.6% had grants supporting their postgraduate study. The students came from the following knowledge areas: 26.1% from social and legal sciences, 45% from humanities, 3.1% from health sciences, 13.3% from engineering or architecture, and 12.5% from experimental sciences. A third (33%) reported a vocation as the main reason for doing the course, whereas 57.8% reported that the main reason was to find a job, and 9.2% reported other motives. Finally, their grades when starting the courses were very good (62.5%), pass (34.9%), and outstanding (2.6%).

Instruments

Study Approaches. Study approaches were evaluated using the Inventory of Study Processes (Inventario de procesos de Estudio, IPE) from Rosário et al (2013). This is a self-report scale used in previous research in various educational stages, including university (e.g., Amieiro et al., 2018). It provides information about two typical study approaches: surface and deep. The *surface* approach is characterized by extrinsic motivation and the use of reproductive learning strategies (e.g., "I ask the teachers to tell me exactly what topics will be in the midterm/final exam, because I only revise that"). The *deep* approach is characterized by intrinsic motivation and the use of elaboration and metacognitive learning strategies (e.g., "I enjoy studying. When I study I try to understand and say in my own words what is written in the books/notes"). Although the reliability cannot be rated excellent in either of the two subscales, either in previous studies or in this study, the indices of fit are acceptable: surface approach (6 items; $\alpha = .65$; $\omega = .67$), deep approach (6 items; $\alpha = .61$; $\omega = .64$).

Learning strategies. The learning strategies were assessed using the Motivated Strategies of Learning Questionnaire (MSLQ) created by Paul Pintrich and colleagues at the end of the last century. It is composed of two types of strategies: motivational and cognitive. Within the motivational strategies there are three components: expectational (expectations of control and self-efficacy), value (intrinsic goals, extrinsic goals, and task value), and affective (anxiety about exams). The cognitive strategies are split between the cognitive and metacognitive (repetition, organization, elaboration, critical thinking, and metacognition) and resource management (time management and study environment, effort regulation, peer learning management, and help-seeking). As in previous studies (e.g., Roces & Sierra, 2017), the MSLQ exhibited adequate reliability. Specifically, in 11 of the 15 subscales it ranges between $\alpha = .60$ and $\alpha = .85$. The four remaining subscales show somewhat lower reliability (between $\alpha = .43$ and $\alpha = .59$). As in the other scales, the values of omega are similar to alpha in all of the subscales.

Self-regulation learning strategies. We used the Inventory of Self-Regulated Learning Processes (Inventario de Procesos de Aprendizaje Autorregulado, IPAA), created by Rosário et al (2007) to evaluate the use of self-regulation strategies when studying. Although it distinguishes three subscales –planning (e.g., "I make a plan before starting written work. I think about what I'm going to do and what I'll need to do it"), monitoring or execution (e.g., "When I study, I try to understand the subjects, take notes, summarize, complete exercises, and ask questions about controls"), and evaluation (e.g., "After finishing a midterm/final exam, I review it mentally to work out what I got right and wrong, and to have an idea of the grade I'll get")– we used an overall measure of learning self-regulation. The IPAA has been used in various contexts and has been shown to be reliable and valid (e.g., Cerezo et al., 2019; Rosário et al., 2012, 2015). The scale exhibits good reliability (12 items; $\alpha = .80$; $\omega = .80$).

Teaching processes. This was measured using 14 items constructed specifically for this study. Exploratory factor analysis reported a good fit to a two-factor theoretical model, in agreement with the research team's initial theoretical model. The subscales refer to the learning content, activities, and evaluation, –and what we call *elements* of the teaching process– (e.g., "The activities we did have contributed to reaching set goals." and "The evaluation criteria and systems my teacher uses seem appropriate"), and the teaching relationship established between the students and the teacher –what we call the teaching *process*– (e.g., "The teacher answers the students' questions" and "The teacher gives examples or situations to make learning easier"). The reliability of the elements scale is very good (5 items; $\alpha = .89$; $\omega = .90$), and of the process scale it is excellent (9 items; $\alpha = .93$; $\omega = .93$).

The variables *gender* (woman = 1, man = 2) and *motivation* for doing the master's (vocational, instrumental, other) were each measured by one item.

The questionnaires were applied by researchers who were experts in psycho-educational evaluation in each of the participating universities, and were applied a single time to each group.

Data analysis

We examined the descriptive statistics of the variables used in this study: gender, reason for doing the master's, teaching process (predictor variables), study approach, learning strategies, and use of self-regulation strategies (criterion variables). To test the hypotheses, we performed various univariate (ANOVA) and multivariate (MANOVA) analyses of variance. We evaluated the quality of the teaching process using an *ad hoc* questionnaire. Prior to studying the relationship between the quality of the instructional process and the criterion variables, we performed a cluster analysis (k-means) in order to establish the levels of the variable "quality of the instructional process", based on the combination of the variables "student-teacher interaction" and "elements of the teaching process". We produced a three-group model with a good fit (the convergence process was halted in the fifth iteration). The size of the differences between groups was evaluated according to eta-squared and Cohen's d (small $\eta_p^2 = .01$, $d \geq 0.20$; medium $\eta_p^2 = .059$, $d = 0.50$-0.79; large $\eta_p^2 = .138$, $d \geq 0.80$).

Results

Descriptive statistics

Table 1 provides descriptive statistics of the variables included in the present investigation. More than 83% of the correlations are statistically significant and the distribution of the variables can be considered normal (both skewness and kurtosis are between 1 and -1).

Multivariate analysis of variance

Owing to the limitation on the number of words by the journal, we have omitted the descriptive statistics and the results of the multiple comparisons (they may be requested from the corresponding author).

Gender

Table 2 shows the results of the analysis of variance with gender as the predictor variable, and learning strategies (fifteen), study approaches (two), and the overall self-regulation index (one) as criterion variables.

At a multivariate level, the data exhibit gender differences in both the use of learning strategies and self-regulation ($\lambda_{wilks} = .843$; $F(16,591) = 6.883$; $p < .001$; $\eta_p^2 = .157$) and the study approaches

Table 1
Matrix of Pearson correlations and descriptive statistics

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	–																			
2	.14**	–																		
3	.40**	.23**	–																	
4	.32**	.18**	.29**	–																
5	.40**	.12**	.15**	.35**	–															
6	.03	.30**	.19**	.00	-.29**	–														
7	.10*	.27**	.18**	.08*	.06	.22**	–													
8	.50**	.12**	.38**	.20**	.37**	.01	.24**	–												
9	.25**	.16**	.23**	.05	.18**	.08*	.34**	.56**	–											
10	.55**	.08*	.24**	.17**	.35**	-.03	.11**	.65**	.32**	–										
11	.44**	.18**	.31**	.11**	.36**	.02	.23**	.60**	.45**	.53**	–									
12	.26**	.20**	.17**	.00	.26**	-.10*	.20**	.31**	.28**	.19**	.42**	–								
13	.32**	.17**	.30**	.08*	.24**	-.06	.17**	.32**	.20**	.19**	.40**	.57**	–							
14	.14**	.05	.17**	.00	.06	.00	.23**	.23**	.25**	.18**	.20**	.18**	.13**	–						
15	.18**	.11**	.17**	.08*	.11**	.09*	.23**	.25**	.28**	.25**	.22**	.12**	.08*	.51**	–					
16	.40**	.35**	.35**	.13**	.25**	.11**	.33**	.51**	.44**	.39**	.54**	.52**	.50**	.30**	.29**	–				
17	-.22**	-.06	-.26**	.00	-.09*	.03	.00	-.27**	-.15**	-.21**	-.28**	-.35**	-.41**	-.02	.01	-.28**	–			
18	.47**	.20**	.38**	.18**	.22**	.07	.13**	.55**	.31**	.48**	.49**	.41**	.42**	.16**	.23**	.57**	-.30**	–		
19	.18**	.12**	.54**	.26**	.05	.08*	.06	.20**	.11**	.06	.15**	.07	.15**	.07	.08*	.19**	-.21**	.20**	–	
20	.18**	.10**	.54**	.20**	.05	.09*	.02	.15**	.04	.12**	.13**	.09*	.11**	.04	.07	.15**	-.17**	.20**	.75**	–
M	3.58	2.46	3.16	3.38	3.83	2.50	3.39	3.61	3.75	3.39	3.42	3.57	3.63	3.03	2.86	3.47	2.60	3.23	6.49	5.86
SD	0.687	0.883	0.835	0.733	0.629	0.962	0.779	0.729	0.924	0.791	0.619	0.617	0.797	0.721	0.850	0.640	0.787	0.666	1.811	2.157
SKW	-0.308	0.338	-0.154	-0.119	-0.453	0.396	-0.241	-0.628	-0.589	-0.207	-0.232	-0.115	-0.400	-0.240	0.116	-0.207	0.571	-0.168	-0.694	-0.196
KUR	0.142	-0.256	-0.347	0.006	0.389	-0.482	-0.089	0.508	-0.343	-0.128	-0.170	-0.346	-0.114	-0.177	-0.265	-0.064	0.839	0.079	0.269	-0.406

Note: 1. Intrinsic goal orientation; 2. Extrinsic goal orientation; 3. Task value; 4. Control of learning beliefs; 5. Self-efficacy for learning and performance; 6. Test anxiety; 7. Rehearsal strategies; 8. Elaboration strategies; 9. Organization strategies; 10. Critical thinking; 11. Metacognitive self-regulation; 12. Time and study environment; 13. Effort regulation; 14. Help seeking; 15. Peer learning; 16. Use of self-regulation learning strategies (general index); 17. Surface approach to study; 18. Deep approach to study; 19. Teacher-student interaction (instructional process); 20. Elements of the instructional process.
* $p < .05$; ** $p < .01$

($\lambda_{wilks} = .976$; $F(2,618) = 7.678$; $p < .01$; $\eta_p^2 = .024$) (large and small, respectively). From a univariate perspective (see Table 2), the gender differences occur in all of the learning strategies (motivational, cognitive, and management), except for intrinsic goal orientation, control of learning beliefs and self-efficacy, critical thinking, and help-seeking. The data indicate that, compared to men, women reported being equally motivated intrinsically, and more motivated extrinsically, they valued tasks more, they reported higher levels of anxiety about exams, they used significantly more strategies of information management (repetition, organization, elaboration), they used more metacognitive strategies (e.g., thinking about what they are doing), they managed resources better (time, environment, effort, peers), and they used more self-regulated learning strategies (thinking before, during, and after). Men, on the other hand, reported more surface study and less deep study.

Motivation

Table 3 gives the differences in the use of learning strategies, self-regulation strategies, and study approaches based on the different reasons for starting the master's (vocation, instrumental, other).

From a multivariate perspective, there were statistically significant differences between the three reasons in terms of the use of learning strategies and self-regulation ($\lambda_{wilks} = .879$; $F(32,1180) = 2.453$; $p < .001$; $\eta_p^2 = .062$), with a medium effect size. The differences between reasons were statistically significant in most of the criterion variables. Specifically, compared to students with instrumental or other motivations, students with vocational motivational orientation reported higher levels of intrinsic goal orientation, task value, elaboration strategies, organization strategies, critical thinking, metacognition, time and study environment management, effort, help-seeking, peer-learning, use of self-regulation strategies, and a deeper approach to study.

Perceived quality of the instructional process

The cluster analysis, based on the combination of the two dimensions of perceptions of the instructional process, gave rise to three groups: high perceived instructional quality (279 subjects), medium perceived instructional quality (252 subjects), and low perceived instructional quality (89 subjects). The differences between the three groups in the two dimensions were statistically significant: teacher-student interaction processes ($F(2,617) = 744.17$; $p < .001$), and elements of the teaching process ($F(2,617) = 874.39$; $p < .001$). The result is shown graphically in Figure 1.

At the multivariate level, the results show large differences between the three groups of students according to the perceived quality of the instructional process, mainly in the use of learning strategies and self-regulation ($\lambda_{wilks} = .676$; $F(32,1180) = 7.990$; $p <$

Table 2
Gender differences in learning strategies, self-regulation strategies, and approaches to study

	F(1,606)	p <	η_p^2	d' Cohen
LEARNING STRATEGIES				
Intrinsic goal orientation	1.084	.298	.002	0.089
Extrinsic goal orientation	4.096	.043	.007	0.168
Task value	10.702	.001	.017	0.263
Control of learning beliefs	.695	.405	.001	0.063
Self-efficacy for learning and performance	.071	.789	.000	0.000
Test anxiety	11.158	.001	.018	0.271
Rehearsal strategies	29.437	.000	.046	0.439
Elaboration strategies	21.631	.000	.034	0.375
Organization strategies	53.811	.000	.082	0.598
Critical thinking	.802	.371	.001	0.063
Metacognitive self-regulation	9.390	.002	.015	0.247
Time and study environment	13.549	.000	.022	0.300
Effort regulation	13.927	.000	.022	0.300
Help seeking	1.393	.238	.002	0.089
Peer learning	5.980	.015	.010	0.201
SELF-REGULATION LEARNING				
Use of self-regulation learning strategies (general index)	15.774	.000	.025	0.320
APPROACH TO STUDY				
Surface approach to study	13.565	.000	.021	0.293
Deep approach to study	5.583	.018	.009	0.191

Table 3
Differences in strategies and approaches based on reason for starting the course

	F(1,606)	p <	η_p^2	d' Cohen
LEARNING STRATEGIES				
Intrinsic goal orientation	8.567	.000	.028	0.339
Extrinsic goal orientation	2.288	.102	.008	0.179
Task value	13.059	.000	.041	0.413
Control of learning beliefs	.827	.438	.003	0.109
Self-efficacy for learning and performance	1.643	.194	.005	0.142
Test anxiety	2.185	.113	.007	0.168
Rehearsal strategies	2.106	.123	.007	0.168
Elaboration strategies	6.614	.001	.021	0.293
Organization strategies	5.328	.005	.017	0.263
Critical thinking	14.427	.000	.046	0.439
Metacognitive self-regulation	9.527	.000	.031	0.358
Time and study environment	4.463	.012	.015	0.247
Effort regulation	9.320	.000	.030	0.352
Help seeking	7.375	.001	.024	0.314
Peer learning	8.553	.000	.027	0.333
SELF-REGULATION LEARNING				
Use of self-regulation learning strategies (general index)	7.348	.001	.024	0.314
APPROACH TO STUDY				
Surface approach to study	4.225	.015	.013	0.229
Deep approach to study	11.801	.000	.037	0.392

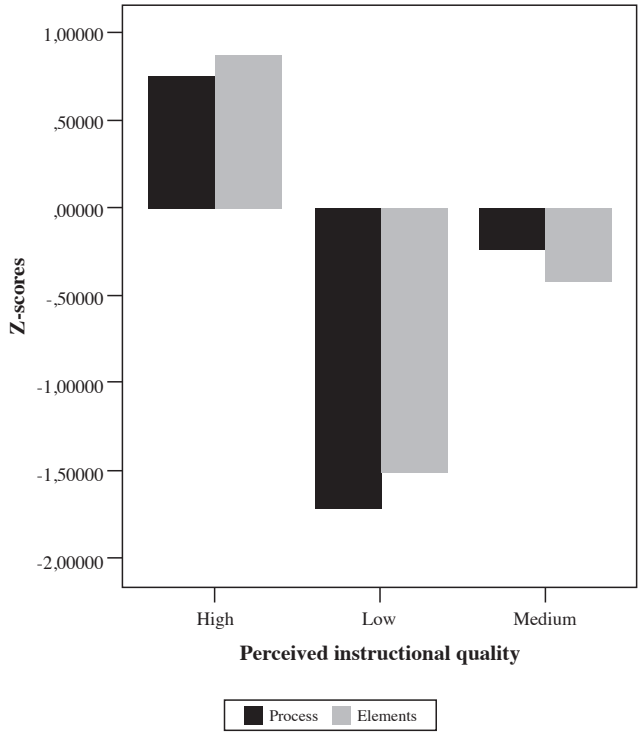

Figure 1. Student groups according to their perception of the quality of the instructional process based on the combination of two dimensions: process (quality of the instructional process) and elements (elements of the instructional process)

.001; $\eta_p^2 = .178$), and to a lesser extent, in study approaches ($\lambda_{wilks} = .954$; $F(4,1232) = 7.370$; $p < .001$; $\eta_p^2 = .023$). From a univariate perspective, statistically significant differences were found between the three groups of students in seven of the 15 learning strategies and in the use of self-regulation strategies (see Table 4). These differences were mainly in the expectational component (intrinsic and extrinsic motivation, control beliefs, and task value), but also in cognitive (elaboration and metacognitive) and regulation (effort) strategies, in study approaches, and in the use of self-regulation strategies. Students who perceived higher instructional quality demonstrated higher scores in the aforementioned motivational, cognitive, and regulation strategies, as well as higher levels of use of self-regulation strategies and a deeper approach to study than the students in the other two groups.

Discussion

In this study, we examined the extent to which postgraduate students' study and learning processes were related to both personal variables (the reason for doing the master's and gender) and the teaching context (perceived instructional quality). Our three hypotheses were confirmed by the data.

In line with the majority of prior studies, we confirmed the hypothesis of gender differences. More specifically, we found gender differences both in the use of learning strategies and in study approaches, and the use of self-regulated learning processes. As in previous studies (e.g., Cano, 2000; Romero et al., 2018), compared to men, women reported more intrinsic motivation, greater use of organization and elaboration learning strategies, and greater use of self-regulation strategies in the learning process. In summary,

Table 4
Perceived quality of the teaching process (low, medium, high)

	F(1,606)	p <	η_p^2	d' Cohen
LEARNING STRATEGIES				
Intrinsic goal orientation	7.967	.000	.026	0.327
Extrinsic goal orientation	5.842	.003	.019	0.278
Task value	123.023	.000	.289	1.275
Control of learning beliefs	13.884	.000	.044	0.429
Self-efficacy for learning and performance	.779	.460	.003	0.109
Test anxiety	1.796	.167	.006	0.155
Rehearsal strategies	1.266	.283	.004	0.127
Elaboration strategies	9.001	.000	.029	0.346
Organization strategies	1.648	.193	.005	0.142
Critical thinking	1.845	.159	.006	0.155
Metacognitive self-regulation	3.152	.043	.010	0.201
Time and study environment	1.913	.148	.006	0.155
Effort regulation	4.919	.008	.016	0.255
Help seeking	2.009	.135	.007	0.168
Peer learning	2.492	.084	.008	0.179
SELF-REGULATION LEARNING				
Use of self-regulation learning strategies (general index)	8.014	.000	.026	0.327
APPROACH TO STUDY				
Surface approach to study	9.061	.000	.029	0.346
Deep approach to study	9.911	.000	.031	0.358

women reported a deeper, less surface approach to study than the men. However, given that there are recent studies in which no gender differences have been found in terms of learning strategies and study approaches (e.g., Ramudo-Andión et al., 2020) it seems necessary to continue looking into the causes that may lie behind these discrepancies (social, contextual, etc.).

With regard to the reasons for doing postgraduate study, as we hypothesized, the data show that students who had more "vocational" reasons for starting a master's, in comparison to the other two types of motivation (finding a job or other reasons), reported a much deeper, less of a surface, approach to study. These results are in line with those provided by other studies, reporting that students who are more oriented to learning goals use more strategies that tend towards significant, deep learning, and fewer strategies that tend towards repetitive, memorization based learning (e.g., Cano & Berbén, 2009; Ciani et al., 2010; Pintrich, 2003; Valle et al., 2015). In other words, they use a deeper study approach (e.g., Entwistle, 2009; Rosário et al., 2013) that is less superficial (e.g., Herrmann et al., 2017). However, regardless of the reason for doing postgraduate study, women reported deeper approaches to study than the men.

In terms of the relationship between the teaching process and the learning process, although we approached it from a person-centered perspective (e.g., Lazarides, 2020; Valle et al., 2919), which is different to that used habitually (variable or task centered), the trend of the results is clear, and in line with many of the previous studies looking at this (e.g., De la Fuente et al., 2010; Entwistle, 2009; Ilhan-Beyaztas, 2019; Rosário et al., 2013; Vizoso et al., 2018). In general, as other studies have shown (e.g., Entwistle, 2009), students' perceptions of the instructional process and the teaching context are closely related to their approach to study and learning. The characteristics of the teaching context have a strong influence on the students' motivations and the learning strategies they use. In this study, as we hypothesized, students in the group which had the highest perceptions of the quality of instructional processes tended to score higher in the use of learning strategies (motivational, cognitive, and regulatory) and self-regulation of the study and learning process, followed by those who perceived moderate quality instructional processes, and to a lesser extent, those who perceived low quality instructional processes. With regard to the approach to study, the differences were between the group perceiving high quality instructional processes and the other two (medium and low perceived quality), but not between the latter. Specifically, the students who perceived high quality instructional processes, in comparison with the other two groups, reported study approaches that were much deeper, in other words, more focused on significant, deep learning, whereas those with lower perceptions of the quality of the instructional process were more involved in repetitive and surface learning.

In conclusion, the data from our study suggest that the processes of deep learning occur in students who have vocational reasons to do postgraduate study (with the aim of completing their training to be a good teacher) and that, once on the course, they perceive quality instructional processes (demanding personal involvement in the construction of learning and in the development of the skills they seek). However, these results must be taken with caution as there are some limitations that are worth noting: (a) the well-known problems of reliability and validity of self-report instruments, with and without inverted items (Vigil-Colet et al., 2020), (b) the correlational, transversal study design, which makes it difficult to make causal inferences, and (c) the limited sample of students affects the generalization of the results; it remains to be seen whether these data can be extrapolated to what happens in other postgraduate courses or in other contexts. In addition, when making inferences towards educational practice, it should be borne in mind that, with few exceptions, the effect sizes were small and in the odd case, medium.

The results of our study have clear practical implications for university educational policy. The data clearly indicate that both the reasons for starting postgraduate study and the perceived quality of the instructional process are two important variables which are closely associated with the quality of the students' learning. Therefore, in the selection process for the students as well as for teachers, it seems advisable to consider these two variables. In this way, the selection process for prospective secondary school teachers should bear in mind that students with a vocational motivational orientation, more than any other, will use complex cognitive and metacognitive strategies in their learning processes that ensure quality training. Similarly, in the selection of teachers for masters' it is important to consider quality indicators of the teaching process and encourage continued subsequent training. As we have seen, when students see that they are receiving quality teaching processes, they tend to better involve themselves in their training as future teachers.

Acknowledgements

This work was partially funded by the European Regional Development Funds (European Union and Principality of Asturias) through the Science, Technology and Innovation Plan (GRUPIN14-100, GRUPIN14-053 and FC-GRUPIN-IDI/2018/000199).

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