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# The impact of a peer-tutoring program on quality standards in higher education

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**Abstract** The purposes of this study were, on one had, to determine the impact of a peer tutoring program on preventing academic failure and dropouts among first-year students ($N = 100$), from Civil Engineering, Economics, Pharmacy, and Chemical Engineering careers; while, on the other hand, to identify the potential benefits of such tutoring program on the cognitive and metacognitive learning strategies and social skills of student mentors in their last year of studies or already in a postgraduate program ($N = 41$) at the University of Granada (Spain). After building and selecting the measurement instruments necessary to gather demographic and academic relevant information on both samples, and assigning first-year students to either an experimental or control group, the intervention consisted of ten 90-min tutoring sessions during the first semester lead by student tutors who, in turn, had undergone four 3-h training sessions on tutoring contents like planning and time management, cognitive and metacognitive learning strategies, motivational strategies and the use of materials designed *ad hoc* for this program. The results show differences in favour of the treatment group on grade point average, performance rate, success rate and learning strategies and, also, statistically significant pre-post differences for the tutors on learning strategies and social skills.

**Keywords** Peer tutoring · Higher education · Academic performance · Cognitive strategies · Metacognitive strategies · Social skills

*Disclaimer*: However, any opinions expressed are those of the authors and do not represent Ministry of Science and Innovation positions or policies.

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## Introduction

Higher Education, both in Europe and the United States of America, is facing many challenges. On one hand, the student body is itself becoming more diverse in age, experience level, motivation, and learning need (Brown and Kysilka 2002; Carter and McNeill 1998; Odell et al. 2003); on the other hand, institutions are facing growing resources constrains (Salerno 2005) rapid technological advancements, demographic changes, and a growing demand for accessibility and equity (Whitt et al. 2008). Along this process, colleges and universities have been called upon to address these challenges by focusing more intentionally and systematically on undergraduate programs in terms of student retention and academic outcomes (Arco et al. 2005; Wolf-wendel et al. 2009).

Regarding student retention, despite some difficulties in making comparisons across countries, given the fact that each country defines and calculates such rates in particular ways, there exists some useful information on degree completion rates for the year 2003 (the number of degrees completed per 100 students enrolled). The following countries have these completion rates (Davies 2006; Instituto de Evaluación 2009; Van Stolk et al. 2007): Japan 26%, the United Kingdom 24%, Australia 23%, Denmark 23%, Ireland 21%, France 20%, Korea 18%, Sweden 18%, United States 17%, and Spain 17%.

In Spain, there are 77 institutions of higher education (50 public and 27 private). About 84% of the students access the university through a national exam. In the last 20 years, student enrollments have multiplied threefold, and faculty and staff have grown at a similar rate. Furthermore, the number of graduates has grown up to 77% during this period of time. During the academic year 2008–2009, a total of 1,504,276 students were registered in higher education (including 1,358,875 undergraduate students, 49,799 master's students and 77,249 Ph.D. students). The University of Granada (UGR), particularly, is a public university located in the city of Granada, in southern part of Spain. It is one of the five largest research universities in the country, offering more than 70% of the academic specializations and official degrees offered in the country (Ministerio de Educación 2009). In 2008–2009, it had about 56,000 undergraduate and 30,000 postgraduate registered students.

Studies on the quality of the Spanish higher education show a low productivity level, especially among freshmen students (Consejo de Coordinación Universitaria 2002). While the number freshmen students within this system is quite high, the percentage of dropouts reaches 26%; moreover, while 48% of university students do repeat course, at one point or another in their program of study, only 26% of the students finish their studies in due time (Consejo de Coordinación Universitaria 2002; Gutiérrez 2002; Pozo 2000; Rodríguez 2004). In consequence, the average duration of university programs for a great number of students is almost half over the institutionally pre-established time. Interestingly enough, in technical programs, 30% of the students repeat the first year, while the percentage of students who take final exams at the end of the course falls below 30% (Consejo de Coordinación Universitaria 2002). Among the factors that may contribute to this situation are (a) that lecturing in large classroom halls is the predominant teaching style—a style that does not provide ample opportunities for student participation; (b) that class attendance is not required in order to take exams or pass the class; and (c) that professors' spend office hours mainly doing grade revisions after exams (Consejo de Coordinación Universitaria 2002). Other contextual factors affecting students' engagement and persistence during their university studies have to do with the way in which the institution allocates its resources and organizes both services and learning opportunities to encourage students to participate in, and benefit from, Academic and Student Affairs programs (Kuh 1996; Pascarella and Terenzini 2005).

If, to all this, one adds the great variability in the profiles of students entering the University (Brown and Kysilka 2002; Carter and McNeill 1998; Guardia 2000; Odell et al. 2003) and the fact that 60% of the drop-outs take place during the first academic year, it is easy to see that something needs to be done in order to reverse the situation (Consejo de Coordinación Universitaria 2002). Needless to say, such low levels of retention and performance, besides having a high economic and social cost and causing considerable levels of frustration among students and university faculty and administrators, significantly and negatively affect the quality of teaching (Fernández et al. 2010). This is why so many authors have devoted a great deal of effort to developing models, activities and programs that may prevent academic failure (Bean 1990; Carter and McNeill 1998; Clark 2005; Lee et al. 2009; Martín et al. 2004; Murtaugh et al. 1999; Pascarella and Terenzini 2005; Pozo 2000; Ryan and Glenn 2003; Rodríguez 2004; Tinto 1993). Established theories and constructs long associated with student success (including involvement, engagement, and integration) have effectively guided educational practice for decades; but, most recently, research studies advocate for researchers and policy makers to be critical of the traditional theories of student retention and to pose new questions related to how students participate in college and to which extent current theories account for diverse learners (Wolf-wendel et al. 2009). This is particularly important, considering the growing cultural diversity of the student body and the relatively low effectiveness of the most widely-cited theories for explaining the drop-out phenomenon among college students (Guiffrida 2006).

Al the local level, the evaluation reports undertaken by the UGR also reflect the need to introduce some useful institutional measures so as to increase student retention and success (Arco-Tirado and Fernández-Balboa 2003). So far, two types of institutional answers have been developed: (a) Academic and Student Affairs programs offering help and support to new students so as to facilitate their integration into the new social and academic environment and (b) programs designed to increase and enhance the psycho-pedagogical skills of the professoriate. The Peer Tutoring Program (PTP) studied in the present study is one of the programs in the first category. More concretely, the PTP is a program of psycho-pedagogical intervention based on peer tutoring sessions whereby older, more experienced students (seniors, Master's) undergo a tutoring training seminar taught by the UGR's professional staff (Durán and Vidal 2004; Topping 1996). The PTP draws upon counseling approaches and seeks to enable students to know, understand, and decide how to spend time on task, engage in quality effort, and participate more actively in learning. All this seems to foster greater student autonomy and involvement. Although such an approach has had a long-standing tradition in secondary schooling (e.g., Durán and Vidal 2004; Kuh 2009; Robinson et al. 2005; Rohrbeck et al. 2003; Tindall 1995; Topping and Ehly 1998), it has been occasionally applied at the university level for preventive purposes, as well. In this vein, several studies and reports (e.g., Benavent and Fossati 1990; Blowers et al. 2003; Fernández et al. 2003; Fresko 1997; Griffin and Griffin 1997; Griffiths et al. 1995; Higgins 2004; Kuresman 2008; Lake 1999; Mynard and Almarzouqi 2006; Nestel and Kidd 2003; Quintrell and Westwood 1994; Topping 1996; Tuckman 2003; Warwick and Holton 2001; Xu et al. 2001) show that, by trusting that students are in the best position to identify their own induction needs (Carter and McNeill 1998), these programs tend to achieve high levels of efficacy and efficiency in addressing diverse problems, such as academic failure, cognitive and metacognitive strategies deficit, and difficulties in social integration (Topping 1996, 2005). Little is known, however, about the effects of these programs upon the tutors, with the exception of some data on personal satisfaction, which, in general, achieves quite high scores (Topping 1996).

To both ends, the following *hypotheses* were established:

**Hypothesis 1** As a result of the PTP, there will be a statistically significant improvement in the freshmen treatment group's Grade Point Average (GPA), reflected in the Academic Report, as compared to that of the freshmen control group.

**Hypothesis 2** As a result of the PTP, there will be a statistically significant improvement in the freshmen treatment group's Performance Rate (PR) (i.e., the coefficient of the number of credits passed divided by the number of credits registered), reflected in the Academic Report, as compared to that of the control group.

**Hypothesis 3** As a result of the PTP, there will be a statistically significant improvement in the freshmen treatment group's Success Rate (SR) (i.e., the coefficient of the number of credits passed divided by the number of credits examined), reflected in the Academic Report, as compared to that of the freshmen control group.

**Hypothesis 4** As a result of the PTP, there will be a statistically significant improvement in the freshmen treatment group's cognitive and metacognitive strategies (measured by the Pozar's Study habits inventory, 2002), as compared to those of the freshmen control group.

**Hypothesis 5** As a result of the PTP, there will be a statistically significant pre- and post-test difference within the freshmen treatment group's cognitive and metacognitive strategies, as measured by the Pozar's Study habits inventory (2002).

**Hypothesis 6** As a result of the PTP, there will be a statistically significant difference in the cognitive and metacognitive strategies of the tutors' group, as measured by Pozar's Study habits inventory (2002).

**Hypothesis 7** As a result of the PTP, there will be a statistically significant difference in the social skills of the tutors' group, as measured by Gismero' Social skills scale (2000).

## Method

### Participants

The sample of this study consisted of 141 students from the UGR. They were distributed in two sub-samples: One hundred freshmen and forty-one tutors. As for the freshmen, half of them were randomly assigned to the treatment group while the other half conformed the control group. Within the treatment group, twenty freshmen studied Civil Engineering, eleven studied Pharmacy, ten studied Economics, and nine studied Chemical Engineering. Furthermore, twenty-six were female and twenty-four were male. Their average age was of 17.9 years (range = 17–19). The control group had an equivalent distribution to that of the control group in terms of degree, gender, and age. The tutors' group was composed of students either in last 2 years of their degree program or already in a postgraduate (doctoral) program. Sixteen of them studied Civil Engineering, nine studied Pharmacy, seven studied Economics, and nine studied Chemical Engineering. Among them, fifteen were female and twenty-six were male. The average age was 23.9 years (range = 21–29).

### Materials and instruments

*The Pozar's Study Habits Inventory* (2002), consisting of 90 multiple-choice items, grouped into 5 scales (i.e., contextual conditions of study, study planning, use of study

materials, learning of study content, and honesty), was completed by the participants. The use of this inventory is justified not only because of the need to measure these cognitive and metacognitive strategies or "study skills" (Tuckman 2003) in higher education students, but also because of the fact that there are no other standardized instruments with its psychometric properties in Spanish. Its reliability index (two-halves model) is higher than .91, its internal validity indexes were (a) between .73 and .86, in the correlation coefficient between direct scores in the inventory's scales and the scores given by professors, and (b) higher than .72 in the correlation coefficients among the inventory's scales. All participants also completed the Study Habits Inventory (Pozar 2002).

*A Social Skills Scale* (Gismero 2000), composed of 33 multiple-choice items, grouped in 6 sub-scales (i.e., self-expression in social situations, defense of own interests as a consumer, expression of discomfort and annoyance, ability of saying "no" and cutting off interactions, ability to make requests, and ability to initiate positive interactions with the opposite sex), was also completed by both the freshmen and the tutors. This scale is commonly used to evaluate social skills in adolescents and adults due to its high reliability index (Cronbach alpha .89) and the acceptable validity indexes of .53 (in the correlation coefficient between the overall direct punctuation in the scale and the overall self-descriptors) and between −.84 for aggressiveness and .84 for assertiveness (in the correlation coefficient with adjectives). The Social Skills Scale (2000) was completed by the tutors only.

*The Academic Report* was additionally used to calculate the freshmen's GPA, PR, and SR.

## Designs and procedures

The number of hypotheses of this study required diverse methodological designs (see Ato 1995; Campbell and Stanley 1963). For hypotheses 1, 2, and 3, a static-group comparison design was used, hypotheses 4 and 5 required a pretest–posttest control group design, whereas hypotheses 6 and 7 called for a one-group pretest–posttest design.

The sampling selection was based on a non-probabilistic sampling technique called "purposeful sampling" (Martínez 1995). This technique consists of four sampling stages. In the first stage (i.e., *selecting the field of study*), the UGR was chosen as the field of study due to the fact that it was wherein the PTP was located. In the second stage (i.e., *inviting participation*), the deans of the four UGR degree programs with the lower rates of academic success were asked permission to allow the students in their respective colleges to participate in the PTP and, by extension, in the present study. In the third stage (i.e., *tentative sampling*), the investigators gave oral presentations and provided written materials about the purposes, processes, and requirements of the PTP to nine groups of doctoral and senior students and to ten groups of freshmen. After the presentations, the researchers solicited students' participation in both the PTP and the study. Forty-five doctoral and senior students and 197 freshmen agreed to participate both in the PTP and the study. As such, these volunteers (i.e., the tutors and the freshmen) were asked to (a) sign a "contract agreement" (Fernández et al. 2003) containing 14 clauses and one agreement section and detailing the rights and obligations of the participants in the PTP; (b) fill out a Self-Evaluation Report (Fernández et al. 2003) consisting of 22 open-ended items and 12 multiple-choice items grouped in 3 areas (i.e., demographic information, academic information, and areas-of-interest information); (c) complete the Study Habits Inventory (Pozar 2002); (d) fill out the Social Skills Scale (Gismero 2000); and (e) provide copies of their Academic Report.

In the fourth stage (i.e., *definite sampling*), a final selection process was undertaken. Of the 45 doctoral and senior students with initially volunteered, 41 were selected as tutors according to the following criteria: (a) having a GPA higher than 1.5 (in a scale from 0 to 4), (b) having an *enneatype* whose score was higher than 4 points on each one of the scales of the Pozar's Study habits inventory (2002), (c) scoring 25 points or higher in 4 of the subscales and the overall direct score on Gismero's Social skills scale (2000), (d) having positive scores on the rest of the areas of the Self-evaluation reports (Fernández et al. 2003), (e) attending the four PTP training sessions, and (f) passing the practical PTP training tests.

Concerning the 197 freshmen who initially volunteered, 110 were finally selected and paired up according to equivalences in three sets of variables (Brooks and DuBois 1995; Corominas 2001; Harackiewicz et al. 2008; Leppel 2002; Murtaugh et al. 1999; Pascarella and Terenzini 2005; Pozo 2000; Rodríguez 2004; Tinto 1993; Tuckman 2003; Valle 1996): (a) demographic variables (e.g., age, gender, nationality); (b) academic variables (e.g., degree program, program year, schedule); and (c) other variables associated with academic success or failure (e.g., cognitive and metacognitive strategies, level of commitment). The remaining 87 students were discarded due to the lack of an appropriate match.

Furthermore, 5 of the 55 initial pairs of freshmen were discarded due to the lack of available tutors (of the 41 tutors, nine agreed to tutor two freshmen). As such, the final freshmen group was composed of 50 pairs. Once the pairs were established, each member of each pair was randomly assigned to either the treatment group or the control group. Parametric and non-parametric analyses did not reveal significant statistical differences between the groups, thus establishing their equivalence. Finally, the matching of the freshmen in the treatment group with their respective tutor was done according to similarities in the program of study, schedules, and nationality (Ato 1995; Durán and Vidal 2004).

As mentioned above, the tutors had to undergo a four-session seminar (see Durán and Vidal 2004; Tindall 1995). Session 1 provided an introduction and a justification of the PTP and instructed tutors and tutees in the use of the Program Manual (a tool used to reflect upon the development and the content of the tutoring sessions, as well as on other aspects of the PTP; see Buela and Sánchez 2002; Caballo 1993; Gargallo 2000; Kee 2002; Zarcone 2000). The usefulness of the use of the Program Manual was ascertained in a previous pilot study (Fernández et al. 2003). This first session also provided the ground for the development of the first tutoring session and the evaluation of the freshmen's needs. Session 2 addressed sleeping habits (Zarcone 2000), eating habits (following the recommendations of the Sociedad Española de Nutrición Básica y Aplicada 2004), and intellectual work habits (e.g., self-regulation, goal setting, time management) (Gargallo 2000). Session 3 focused on strategies for classroom note-taking and assignment completion) and intellectual work techniques (e.g., strategies for accessing information databases, organizing, and exam preparation) (Gargallo 2000). Session 4 tackled basic social skills (Caballo 1993).

The PTP process for the freshmen consisted of a ninety-minute session, once a week, for 10 weeks spread over the first semester of the academic year. The meeting dates, time, and place had been previously concerted between the freshmen and their respective tutor. The tutoring method was mainly based on direct instruction and guided discovery. In the first session, tutor and tutee were introduced to one another, exchanged contact telephone numbers and e-mail addresses, discussed the implication of the PTP (including their respective rights and obligations), and elaborated an academic plan (including assignments for the tutee). In the second session, the tutee's previous assignments were revised, and the needs of the tutee were evaluated so as to determine areas of intervention. As such, healthy

sleeping habits and study habits, conditions and skills (e.g., goal setting, time management, and self-assessment) were addressed, in view of which, new goals and assignments were established. In the third session, the previous assignments were analyzed and the academic plan was adjusted (when necessary). Moreover, a plan for "active" listening in class was designed, additional intellectual/study skills and decision-making techniques were explained, and new assignments were set. The fifth session served to evaluate all that had happened to that point. Afterward, the emphasis was put on reinforcing and re-examining the cognitive and metacognitive strategies and the decision-making processes of the tutees.

### Data analysis

The data for hypotheses 1 (re: Freshmen's GPA), 2 (re: Freshmen's PR), and 3 (re: Freshmen's SR) were analyzed through the *U* of Mann-Whiney and value *d* of Cohen techniques. The data for Hypothesis 4 (re: Freshmen's intergroup cognitive and metacognitive strategies) were analyzed through a discriminant function analysis and an ANOVA, since the assumptions for using parametric test were met in both cases (Kolmogorov–Smirnov to check for normal distribution and the Levene Test to calculate the variance equality for the independent means). The data for Hypothesis 5 (re: Freshmen's intragroup cognitive and metacognitive strategies), 6 (re: Tutors' cognitive and metacognitive strategies), and 7 (re: Tutors' social skills) were analyzed through the *t*-student dependent test, both after applying Kolmogorov–Smirnov to check for normal distribution.

## Results

Pertaining to hypotheses 1, 2, and 3, the respective *U* of Mann–Whitney analyses for the freshmen treatment group on GPA, PR, and SR did not yield statistically significant differences at the end of the PTP, as compared to the results obtained by the freshmen control group (Table 1).

As to Hypothesis 4, the results obtained after comparing the means of the freshmen's treatment and control groups in the post-test showed that the variable "group" (i.e., treatment vs. control) yielded a statistically significant amount of variance (Lamda de Wilks $= .83, p < .000$). Using the Kolmogorov–Smirnov, it was ascertained that there was a normal distribution on both the pre-test and the post-test scores on the four Pozar's Study habits inventory (2002) scales on cognitive and metacognitive strategies. Moreover, the

**Table 1** Intergroup (Treatment vs. Control) comparisons of freshmen's GPA, PR, and SR at the end of the PTP

| | *N* | Mean | SD | *d* |
|---|---|---|---|---|
| GPA | | | | |
| Treatment group | 50 | .91 | .76 | .18 |
| Control group | 50 | .78 | .71 | |
| Performance rate | | | | |
| Treatment group | 50 | .53 | .36 | .17 |
| Control group | 50 | .47 | .34 | |
| Success rate | | | | |
| Treatment group | 50 | .59 | .37 | .22 |
| Control group | 50 | .51 | .36 | |

Levene test was applied to check for homocedasticity. The ANOVA yielded statistically significant differences in the post-test means of the treatment group, as compared to the means of the control group, in two of the four scales—i.e., "study planning" ($F = 11.59$, $p < .01$) and "use of study materials" ($F = 11.00$, $p < .01$) (Table 2).

With regard to Hypothesis 5, again, the Kolmogorov–Smirnov test corroborated a normal distribution both in the pre- and post-test scores on the four Study Habits Inventory Scales on cognitive and metacognitive strategies (Pozar 2002). Following, the *t*-student dependent test showed statistically significant differences between the treatment group's pre-test and post-test results regarding the four sub-scales of "contextual conditions of study" ($t = -2.41$, $p < .05$), "study planning" ($t = -4.73$, $p < .001$), "use of study materials" ($t = -6.84$, $p < .001$), and "learning of study content" ($t = -4.46$, $p < .001$) (Table 2).

In relation to Hypothesis 6, the Kolmogorov–Smirnov test also yielded a normal distribution of the tutors' pre-test and post-test scores on the four cognitive and metacognitive strategies scales on Pozar's Study Habits Inventory (2002). Afterward, the *t*-student dependent test revealed an increase of the average scores in the 4 scales of cognitive and metacognitive strategies, although only the variables "contextual conditions of study" ($t = -3.02$, $p < .01$) and "study planning" ($t = -2.33$, $p < .05$) were statistically significant (Table 3).

Finally, after obtaining a normal distribution from the Kolmogorov–Smirnov the pre- and post-test on Social Skills Scale (Gismero 2000) scores on the five sub-scales, the *t*-student dependent test indicated statistically significant differences on both the sub-scale "ability of saying 'no' and cutting off interactions" ($t = -2.13$, $p < .05$) and the overall Social skills scale score ($t = -2.07$, $p < .05$) (Table 3).

## Discussion

The present study provides research-based data on a higher education peer-tutoring program and delves much deeper into issues that cannot be studied using other types of questionnaires (e.g., academic performance and personal satisfaction with their program of study) (Topping 1996). More concretely, this study was designed to ascertain the usefulness of the PTP—a program designed to improve teaching and learning among freshmen and their tutors by focusing on concrete aspects of student development (e.g., independent learning, cognitive and metacognitive strategies, social skills). The conclusions of the study are the following: First, the PTP did not have a statistically significant impact on freshmen's GPA, PR, SR, and, hence, hypotheses 1, 2 and 3 could not be accepted. Second, by contrast, as a result of the PTP, there was a statistically significant difference between the freshmen's treatment and the control groups in some of their cognitive and metacognitive strategies (i.e., "study planning" and "use of study materials"); and, therefore, Hypothesis 4 can be partially accepted. Third, when compared to the pre-tests, the post-tests of the freshmen's treatment group indicated that the PTP did statistically significantly enhance cognitive and metacognitive strategies (i.e., "contextual conditions of study", "study planning", "use of study materials", and "learning of study content"), confirming, therefore, Hypothesis 5. Fourth, the PTP also proved to be beneficial for the tutor's group since there was a statistically significant pre-test/post-test difference within the tutor's group regarding their cognitive and metacognitive strategies (i.e., "contextual conditions of study" and "study planning") and their social skills (i.e., "ability of saying 'no' and

**Table 2** Pre-test/post-test & intragroup comparisons of freshmen treatment versus control groups regarding cognitive and metacognitive strategies

| | *N* | Mean | SD | *d* |
|---|---|---|---|---|
| Pre-test | | | | |
| Contextual conditions of study | | | | |
| Treatment group | 50 | 25.14 | 3.23 | – |
| Control group | 50 | 24.48 | 3.15 | |
| Study planning | | | | |
| Treatment group | 50 | 13.56 | 5.14 | – |
| Control group | 50 | 13.55 | 4.75 | |
| Use of study materials | | | | |
| Treatment group | 50 | 18.64 | 3.09 | – |
| Control group | 50 | 18.43 | 3.19 | |
| Learning of study content | | | | |
| Treatment group | 50 | 21.93 | 4.36 | – |
| Control group | 50 | 21.71 | 3.27 | |
| Post-test | | | | |
| Contextual conditions of study | | | | |
| Treatment group | 50 | 25.94 | 3.28 | .29 |
| Control group | 50 | 24.67 | 3.39 | |
| Study planning | | | | |
| Treatment group | 50 | 16.88 | 3.98 | .74 |
| Control group | 50 | 13.39 | 5.31 | |
| Use of study materials | | | | |
| Treatment group | 50 | 20.84 | 2.82 | .72 |
| Control group | 50 | 18.58 | 3.40 | |
| Post-test | | | | |
| Learning of study content | | | | |
| Treatment group | 50 | 23.23 | 4.13 | .33 |
| Control group | 50 | 21.94 | 3.66 | |
| Treatment group | | | | |
| Contextual conditions of study | | | | |
| Pre-test | 50 | 25.14 | 3.23 | .24 |
| Post-test | 50 | 25.94 | 3.28 | |
| Study planning | | | | |
| Pre-test | 50 | 13.56 | 5.14 | .72 |
| Post-test | 50 | 16.88 | 3.98 | |
| Use of study materials | | | | |
| Pre-test | 50 | 18.64 | 3.09 | .74 |
| Post-test | 50 | 20.84 | 2.82 | |
| Learning of study content | | | | |
| Pre-test | 50 | 21.93 | 4.36 | .31 |
| Post-test | 50 | 23.23 | 4.13 | |

**Table 2** continued

| | *N* | Mean | SD | *d* |
|---|---|---|---|---|
| Control group | | | | |
| Contextual conditions of study | | | | |
| Pre-test | 50 | 24.48 | 3.15 | .06 |
| Post-test | 50 | 24.67 | 3.39 | |
| Control group | | | | |
| Study planning | | | | |
| Pre-test | 50 | 13.55 | 4.75 | .03 |
| Post-test | 50 | 13.39 | 5.31 | |
| Use of study materials | | | | |
| Pre-test | 50 | 18.43 | 3.19 | .04 |
| Post-test | 50 | 18.58 | 3.40 | |
| Learning of study content | | | | |
| Pre-test | 50 | 21.71 | 3.27 | .07 |
| Post-test | 50 | 21.94 | 3.66 | |

cutting off interactions" and the total Social Skills Scale score) respectively. As such, hypotheses 6 and 7 can also be partly accepted.

Given the particular purposes of the study, the results ought to be interpreted not only considering the *probability* and *statistical significance* values (Goldschmid 1976); but, also, and perhaps more importantly, on the basis of the *effect size* (Coe and Merino 2003; Frías et al. 2000; Glass et al. 1981). In fact, the effect size allows one to reach more useful conclusions in relation to the potency of the results (Cohen 1988). In this sense, the values of the effect size in the dependent variables for hypotheses 1, 2, and 3 allow one to see that freshmen in the treatment group scored higher than 58% on GPA, PR and SR than their counterparts in the control group. Furthermore, bearing in mind Coe and Merino's (2003) suggestion that an effect size higher that .1 would constitute an already noteworthy improvement, the effect sizes obtained in this study for each of the aforementioned aspects (i.e., .18, .17, and .22, respectively) become quite remarkable, especially when taking into account the size of the effect accumulates over time (see also Glass, et al. 1981; Keselman et al. 1998; Ledesma et al. 2008). Considering, furthermore, that PTP also had statistically significant effects on the treatment group's acquisition of "cognitive and metacognitive strategies," it could be affirmed that PTP did contribute to enhance academic success (Benavent and Fossati 1990; Fernández et al. 2003; Griffin and Griffin 1997; Higgins 2004; Lake 1999; Nestel and Kidd 2003; Topping 1996, 2005; Tuckman 2003; Xu et al. 2001). These results are particularly relevant for Academic and Student Affairs professionals, since they can champion and consistently use this research-based innovative practice to improve critical current indicators of quality in higher education (e.g., course completion rates, success rates, student retention, graduation rates, student satisfaction, student personal and professional development, and citizenship). We do also agree with Kuh (2009) that Academic and Student Affairs professionals could also take the lead in monitoring student participation in these and other high-impact educational activities, while working with academic administrators and faculty to find ways to create effective and efficient opportunities for students, especially for those who start college with two or more "risk" factors (e.g., being academically underprepared, being the first in the family to go to college, or coming from low-income backgrounds). Moreover, the PTP offers a viable

**Table 3** Tutors' pre-test/post-test comparisons of cognitive and metacognitive strategies and social skills

| | *N* | Mean | SD | *d* |
|---|---|---|---|---|
| Contextual conditions of study | | | | |
| Pre-test | 41 | 26.74 | 2.40 | .32 |
| Post-test | 41 | 27.49 | 2.19 | |
| Study planning | | | | |
| Pre-test | 41 | 18.50 | 4.18 | .20 |
| Post-test | 41 | 19.28 | 3.51 | |
| Use of study materials | | | | |
| Pre-test | 41 | 21.00 | 2.04 | .20 |
| Post-test | 41 | 21.46 | 2.50 | |
| Learning of study content | | | | |
| Pre-test | 41 | 24.81 | 2.97 | .21 |
| Post-test | 41 | 25.46 | 3.13 | |
| Self-expression in social situations | | | | |
| Pre-test | 41 | 24.94 | 4.62 | .13 |
| Post-test | 41 | 25.53 | 4.21 | |
| Expression of discomfort and annoyance | | | | |
| Pre-test | 41 | 11.78 | 2.92 | .18 |
| Post-test | 41 | 12.31 | 2.69 | |
| Ability of saying "no" and cutting off interactions | | | | |
| Pre-test | 41 | 17.44 | 3.45 | .28 |
| Post-test | 41 | 18.42 | 3.49 | |
| Ability to make requests | | | | |
| Pre-test | 41 | 14.33 | 2.71 | .36 |
| Post-test | 41 | 15.25 | 2.45 | |
| Global direct scoring | | | | |
| Pre-test | 41 | 97.14 | 15.16 | .30 |
| Post-test | 41 | 101.39 | 13.22 | |

model to institutions of higher learning as to how to allocate their resources and organize their student support services in order to foster student participation in activities positively associated with persistence, satisfaction, learning and graduation. The PTP also proves to be useful regarding the recommendations of Goldschmid (1976), Schroeder (2004) and Whitt et al. (2008), in the sense that it capitalizes on existing human resources (i.e., students) at low or no cost and without extensive involvement of additional staff.

Additionally, this study has demonstrated the usefulness of the PTP for the tutors, who, on their part, improved some of their cognitive and metacognitive strategies and social skills. In this regard, the present study can be considered to be a pioneering one because, although the data on the tutors stemmed only from a one-group pre-test/post-test design (Ato 1995; Campbell and Stanley 1963), and despite that these data are incidental or unintended outcomes of the study, they did indicate a variety of benefits of the PTP upon these veteran students (e.g., increasing their confidence in communicating and presenting, gaining additional experience in managing people, enhancing their curriculum vitas, improving their ability to manage at work-placement interviews). This is particularly relevant in a context where older students orient their careers toward teaching, either within the university (e.g., as teaching assistants, young professors, tutors) or outside of

higher education (e.g., as school teachers, organization managers). In addition to compensating for some of their shortcomings in their academic and professional preparation (Kuh 2009), the PTP may have also provided them with value recognition and status among their younger peers, as well as contributed to the bettering of both the institutions' learning culture (Carter and McNeill 1998) and student success. Another aspect to consider in regard to the tutors is that their selection was based precisely on their already sophisticated level of cognitive and metacognitive strategies and social skills. As such, these levels may have produced a "regression effect" in the sample (Campbell and Stanley 1963); notwithstanding this fact, the tutors did show an improvement on their post-test scores in some aspects of both Pozar's Study Habits Inventory (2002) and Gismero's Social Skills Scale (2000), a fact that, once again, may point to the usefulness of the PTP for these students.

In view of this, it is reasonable to suggest that if institutional development is to begin to influence curriculum delivery, it will be necessary to reassess the role of higher education tutors as well as to reappraise the interrelatedness between what, in the past, have been considered to be separate areas (i.e., student guidance and the curriculum itself) (Carter and McNeill 1998). In this new scenario, the Academic Affairs and the Student Affairs units will have to draw upon examples of educational practices that include purposeful student-faculty contact; collaboration among faculty and staff; and active and collaborative peer-learning and peer-tutoring strategies in order to enhance their programs and provide appropriate services that engage students not only in the learning process, but also in the exercise of their rights and duties, as indicated in Article 46 of Spain's Organic Law of Universities (Ministerio de Educación, Cultura y Deporte 2001).

Under these circumstances, it can be deemed logical to continue researching the pedagogical, psychological and social variables involved in the enhancement of teaching and learning within programs such as the PTP. Also, to extend what has been found in the present study, researchers may want to address the complexity of peer-tutoring programs employing more sophisticated experimental designs. For instance, researchers could investigate aspects such as the effects of peer-tutoring programs on student motivation, expectations, learning styles (Tinto 1993), or cultural norms (Guiffrida 2006), the effects of these programs over the long term (i.e., beyond one academic year), the particularities of the different learning dynamics students engage in depending on their filed of study or the type of subject matter studied (e.g., compulsory or elective, letters or sciences), and whether there exists a correlation between the improvements of the peer-tutors and those of their tutees, and in what areas. Also, to improve the measurement of the higher-level thinking and independent learning that academic tasks at the college level and to strength the learning skills intervention element of future peer-tutoring programs will require more sophisticated instruments—instruments able to capture not only the type of cognitive and metacognitive learning strategies students use as self-regulatory processes (Kitsantas et al. 2008), but also the complexity of the dynamic interactive systems students operate under (Phan 2010). In this regard, we remain committed to the notion of deliberately embedding the PTP within the institutional agenda as an intricate part of the education system so as to leverage significant institutional change concerning student success (Arco et al. 2005).

In sum, the overall results of the present study seem particularly relevant given the "airs of change" affecting HE in Europe, where the Bologna Process recommends the development of certain student skills such as self-reflection, independent learning, and self-assessment (European University Association 2007). Terms such as "student centredness" and "learner autonomy" may have little meaning to students entering HE; thus, these terms may need to be made explicit at the start of the study program. The emphasis here needs to

placed be on how guidance at an early stage of a college program may foster the development of student autonomy (Carter and McNeill 1998). In this line, the PTP and its corresponding study could be taken as two examples of those "best practices" recommended by the Spanish Network of University Quality Assurance Agencies (Red Española de Agencias de Calidad Universitaria 2009). As such, both the PTP and this study could be very useful to Academic Affairs and Student Affairs professionals, as well as other stakeholders involved in warranting quality within the European Higher Education Area (e.g., those in charge of institutional quality issues, Deans and Vice-Chancellors, or institutional auditors such as those in the AUDIT Program set by the Spanish National Evaluation and Quality Insurance Agency). Moreover, we understand that the PTP and the present study contribute to the development of the internal systems of warranty quality, since they do clearly respond to one of the criteria set by the European National Quality Assurance (Vicerrectorado para la Garantia de la Calidad 2008). Finally, institutions of higher education aiming at building a body of evidence from which to demonstrate their effectiveness and their ability to meet accountability demands in order to obtain scarce resources and facilitate change may benefit considerably from creating, supporting and researching programs like the PTP.

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