SOCIETY FOR THE TEACHING OF PSYCHOLOGY

Teaching of Psychology
39(1) 45-47
© The Author(s) 2012
Reprints and permission:
sagepub.com/journalsPermissions.nav
DOI: 10.1177/0098628311430312
http://top.sagepub.com
SAGE

Continuous Assessment Improved Academic Achievement and Satisfaction of Psychology Students in Spain

María T. Carrillo-de-la-Peña[1] and Jorge Pérez[2]

Abstract

The authors present the experience of a continuous assessment procedure carried out in the second term of a physiological psychology course during 3 consecutive academic years at a Spanish university. Each year, the academic outcomes of students under continuous assessment (the experimental group) were compared with those of students under traditional assessment (the control group), with 903 total students. To control for possible differences in prior academic achievement, grades in the first term of the same subject were used as a covariate, and progress was assessed from the first-term to the second-term evaluations in the experimental and control groups. The results provided robust evidence of the positive impact of continuous assessment on all indices of academic outcomes considered. In addition, responses to a self-report questionnaire revealed that continuous assessment improved students' satisfaction and was perceived by students as a procedure that promotes deeper learning.

Keywords

continuous, formative, innovative assessment, psychology, higher education

The influence of the type of assessment on learning has been widely recognized. It is well known that students adjust their learning processes according to the particular type of assessment used (Wass, Van der Vleuten, Shatzer, & Jones, 2001). Consequently, the choice of the type of assessment is crucial and should closely correspond to the teaching objectives. In this vein, the use of formative and continuous assessment (CA) in the health sciences has become a generalized practical recommendation. Formative assessment provides feedback that assists students in the preparation of topics (Wass et al., 2001; Carrillo-de-la-Peña et al., 2009). CA is associated with a more distributed learning effort throughout the course and is thought to promote deeper learning, greater motivation, and consequently improved understanding of course material (Van der Vleuten, 2000; Butler & Roediger, 2007).

Despite the above assessment recommendations on various educational grounds (Astin et al., 2003), in Spain, many teachers are still reluctant to use CA and rely instead on final exams. In this research, we allowed students to choose the CA procedure and analyzed their academic outcomes and subjective satisfaction in comparison with a control group (within the same classroom) under traditional assessment (TA). We analyzed the grades of students from three classrooms in the second term of a course on physiological psychology, during 3 consecutive academic years. We hypothesized that CA would have positive effects on academic achievement and perceived satisfaction with the teaching process.

Method

Participants

A total of 903 students in physiological psychology in the second term of the 2nd academic year in psychology participated in the study. Participants' mean age was 19.4 years, and the vast majority were full-time students. The requirement to participate in this study was that students had previously participated in the examination during the first term of this annual subject. The present project was conducted at the University of Santiago de Compostela during 3 academic years. The study was performed in three different classroom groups, of about 100 students each, every year.

Procedure

At the beginning of the term, students had to choose to follow TA or CA (rates were about 70% and 30%, respectively). The

[1] University of Santiago de Compostela, Santiago de Compostela, Spain
[2] University Pompeu Fabra, Barcelona, Spain

Corresponding Author:
María T. Carrillo-de-la-Peña, University of Santiago de Compostela, Department of Clinical Psychology and Psychobiology, Campus Post 15702, Santiago de Compostela, Spain
Email: mteresa.carrillo@usc.es

CA group took three formative assessments and had to perform other complementary individual and group tasks. Formative assessments lasted about 20 minutes and had a variable number of multiple-choice questions, ranging from 12 to 20 questions on each assessment. Students received immediate feedback about their performance because each exam was corrected just after it was completed.

The educational format was common for both groups. We consider classroom time as a multiple-use time when students may read, perform tasks in groups, or attend to teachers' explanations. Students from both groups knew that they all would have a final examination (a multiple-choice test) at the end of the course.

For the TA group, the final examination represented 100% of the mark. For the CA group, the exam counted for 70%, and the remainder (30%) could be achieved from formative tests and activities performed throughout the year. Students in both groups had to get 5 of 10 points to pass the course. The course met from February to June. Once students had taken their examinations, they completed an anonymous questionnaire about their subjective evaluations of the CA system.

Measures

We used the following dependent variables in relation to academic achievement: the percentage of students who took part in the second term final examination,[1] mark in the second-term final exam (out of 10 points, for both groups), progress from the first to the second term (computed by subtraction of first-term from second-term exam mark), and the academic qualifications[2] of students in the annual course on physiological psychology for the TA and the CA groups (computed by summing exam plus CA activities in the latter, including the first-term and second-term assessments for both groups).

To control the effect of possible differences in academic achievement prior to the study, we took the marks in the first term of the same subject as a covariate and assessed progress from the first-term to the second-term evaluation in experimental and control groups. As a quality control, we kept the end-of-semester examination for all the students. The educational objectives and teaching procedure were identical for the TA and CA groups, and thus only the evaluation system differed between them.

Data Analyses

We performed the following analyses: (a) χ^2 coefficients to analyze the difference between the TA and CA groups in the percentage of participation in the final evaluation, (b) univariate analysis of variance with group (CA vs. TA) and academic year (3 years) as between-subject factors and previous outcome (mark on the first examination) as the covariate, using the marks on the final exam as the dependent variable[3] (we also performed an analysis of variance with the same between-subject factors using progress [second exam score minus first exam score] as the dependent variable), (c) percentage of each academic qualification for each group, and (d) descriptive statistics of the students' responses to the items of the questionnaire.

Results

Chi-square indices revealed significant differences ($p < .001$) between the TA and CA groups in the proportions of final exam participants and nonparticipants for all academic years (overall rate of nonparticipants: 17.60% for TA vs. 3.41% for CA).

There were significant differences between the CA and TA groups in previous outcome in all academic years. Nevertheless, the effect of group (TA vs. CA) on academic achievement (second-term examination marks) was significant, even after correction of the contribution of the covariate, ($F(1, 803) = 67.20, p < .001$). The effect of group was replicated when progress was the dependent variable, ($F(1, 803) = 50.05, p < .001$). Thus, students who undertook the CA system had better marks and made greater progress on the second-term exam. The effect of group was not moderated by academic year (i.e., the differences between TA and CA were maintained over the 3 years considered).

The CA system was associated not only with a higher proportion of students who successfully passed the course (approximately 80% vs. 63% for the TA system) but also with superior qualifications. The proportions of good, excellent, and honors grades were larger in the CA group than in the TA group in all three cases.

Students' subjective assessments of the CA system were positive. The general satisfaction of students with it ranged from 7.17 to 7.88 on a 10-point scale. Approximately 90% of participants reaffirmed their prior selection of the CA system, and approximately 93% thought that their learning was enhanced because of it. Students under TA also believed that their learning could have been better with the CA system (ranging from 64.3% to 73.8%), and some of them would choose it at the beginning of the course (ranging from 33.3% to 60.4%).

Discussion

In this research, we investigated the influence of CA on the academic outcomes and satisfaction of physiological psychology students. The results indicated that the usefulness of the CA system in facilitating student learning is overwhelming in a context (i.e., Spain) in which CA is not widely practiced.

The CA system was associated with fewer students' dropping the course or not taking the exam at the end of the semester. In addition, the CA system was associated with improved academic achievement, as evidenced by different indicators. Students under CA got better grades on the second-term examination, made better progress from the first-term to the second-term outcome, passed the course in a higher proportion, and earned better official qualifications. It may be argued that students who chose the CA system were probably more hardworking to start with, and we cannot rule out this possibility. In fact, there was a significant difference on the pretest

(first-term outcome) between the CA and TA groups. However, we used the first-term mark as a covariate to control for possible pretest differences and found that that the superior academic achievement of the CA group remained even after the correction of the covariate influence.

These academic results are congruent with the questionnaire responses of students, who in about 93% of cases reported that they learned more and learned more efficiently using the CA system. Thus, altogether, both objective achievement indices and the subjective opinions of students proved that CA promotes student engagement in the subject, increases academic achievement, and improves motivation.

These results are in accordance with previous literature on the benefits of frequent testing. Taking frequent tests stimulates a distributed practice of study throughout the course (spacing effect) and strengthens long-term retention of pieces of information that must be retrieved from memory in different occasions (testing effect; Larsen, Butler, & Roediger, 2008). In addition, testing gives students more opportunities for feedback about their learning process, a subject already recognized as the core element of formative assessment and CA (Black & William, 1998). There is strong evidence that formative assessment results in substantial learning gains (Wininger, 2005).

In summary, our results reveal the utility of CA and may be of interest for both enthusiastic and reluctant teachers. Although this procedure may be quite common in the United States, it is not very common in Spain, where we conducted the present research. This issue is especially relevant given the present context of European universities, which are trying to converge toward the European Higher Education Area. In the new situation, alternatives to the traditional lecture format and to the use of unique final examinations are strongly encouraged to achieve a learner-centered education rather than a content-centered instruction (Tuning Educational Structures in Europe, 2005). Unfortunately, it is still very common to use a single assessment at the end of the teaching process.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

Notes

1. In our university system, it is possible to not take the final exam at the end of the semester (June) and sit for the exam in September.
2. According to the Spanish university official qualification system, we used the following labels: fail (<5), sufficient (5 to 6.9), good (7 to 8.5), excellent (8.5 to 9.5), and honors (9.5 to 10).
3. To avoid a spurious effect of points obtained by CA activities, in this case the exam counted out of 10 for both groups.

References

Astin, A. W., Banta, T. W., Cross, K. P., El-Khawas, E., Ewell, P. T., Hutchings, P., ... & Wright, B. D. (2003). *9 principles of good practice for assessing student learning*. Available at http://www.iuk.edu/~koctla/assessment/9principles.shtml

Black, P., & William, D. (1998). Assessment and classroom learning. *Assessment in Education*, *5*, 7–74.

Butler, A. C., & Roediger, H. L. (2007). Testing improves long term retention in a simulated classroom setting. *European Journal of Cognitive Psychology*, *19*, 514–527. doi:10.1080/09541440701326097

Carrillo-de-la-Peña, M-T., Baillès, E., Caseras, X., Martínez, A., Ortet, G., & Pérez, J. (2009). Formative assessment and academic achievement in pre-graduate students of health sciences. *Advances in Health Sciences Education*, *14*, 61–67. doi:10.1007/s10459-007-9086-y

Larsen, D. P., Butler, A. C., & Roediger, H. L., III. (2008). Test-enhanced learning in medical education. *Medical Education*, *42*, 959–966. doi:10.1111/j.1365-2923.2008.03124.x

Tuning Educational Structures in Europe II (2005). *Universities contribution to the Bologna Process.* Final report. Phase 2. University of Deusto and University of Groningen.

Van der Vleuten, C. (2000). Validity of final examinations in undergraduate medical training. *British Medical Journal*, *321*, 1217–1219.

Wass, V., Van der Vleuten, C., Shatzer, J., & Jones, R. (2001). Assessment of clinical competence. *The Lancet*, *357*, 945–949.

Wininger, S. R. (2005). Using your tests to teach: Formative summative assessment. *Teaching of Psychology*, *32*, 164–166. doi:10.1207/s15328023top3203_7