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Collaborative versus individual learning experiences in virtual education: the effects of a time variable

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Abstract

In this study we analyzed a time effect variable on the performance of collaborative versus individual tasks. Thirty-one postgraduate students carried out two online collaborative learning tasks and two online individual tasks as part of a university course. The results of an ANOVA did not show significant effects of time or task type variables, although the effect of interaction was significant. At the beginning of the course (T1) the students´ performance was significantly higher in the collaborative tasks, while at the end of the course (T2) this trend was reversed, with the students´ performance in individual tasks being significantly higher than in the collaborative tasks. The results suggest implications for when to incorporate collaborative learning tasks in virtual learning environments.

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Keywords: collaborative learning, virtual education, time variable, individual learning;

1. Introduction

Since its inception the use and uses of the Internet have spread very rapidly and this continuing growth has been accompanied by significant developments in new technologies. In the area of higher education the Internet has brought with it new tools for learning and teaching, obliging tutors to reflect on their pedagogical practices and integrate technology into their classes. It has also encouraged and created opportunities for studying and for learning which did not exist even twenty years ago. Now online learning platforms enable students who are in different geographical locations or who have different learning backgrounds to be in contact via various synchronic and asynchronic tools, while increasingly sophisticated virtual world environments are allowing the creation of new learning scenarios. One result of all this growth is that nowadays in countries such as Spain the number of students who study the whole or part of their undergraduate and postgraduate courses online can be counted in thousands

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rather than hundreds, and of course, while studying they are developing the sort of IT skills which are now taken for granted in many professions.

Perhaps one of the most potent aspects of online learning platforms is the possibility of a virtual space which is shared by students and tutors. Shared space offers many opportunities for collaborative and co-operative work (as required by the European Area for Higher Education), but also brings with it the need to understand the learning processes involved; for example, how student-student and student-tutor interactions may influence how and what is learned. Research into online learning to date has focused on a number of aspects such as the advantages and limitations of online learning environments, online tools, types of interaction between students and tutors, or collaborative learning (see, for example, Beldarrain, 2006; Chickering & Ehrmann, 1996; Collis & Moonen, 2005; Dabbagh & Bannan-Ritland, 2005; Weller, Pegler & Mason, 2005). Not so many of these, however, have concerned themselves with analysing the influence on learning of variables such as the students' and tutors' degree of familiarity with the technologies or the duration of the online course. In this paper we are concerned with the last of these.

2. Aims

This study was undertaken during the academic year 2011-2012 with students doing a five-month online distance learning course in Educational Intervention as part of a Master's degree. Our main aim was to analyze how the amount of time spent doing an online course might affect students' performance on collaborative versus individual tasks. In other words, we wanted to see whether task performance was affected by the time spent doing the course and/or by familiarity with the dynamics of an online environment.

3. Methodology

Four types of tasks were employed: two individual and two collaborative. One of the individual tasks consisted in completing an online questionnaire (made up of closed questions) while the other required the participants to write an essay. The two collaborative tasks required the participants work on a group assignment and to take part in an online forum. All four tasks were designed to have a similar level of difficulty and all four contributed equally to the final mark. For the collaborative tasks the students were put arbitrarily into groups of 4-5. The same group carried out both tasks. In total 31 students (14 male, 17 female) took part in the study. Ages ranged between 24-30. All were graduates in Psychology.

Data were taken twice: at 2 months (T1) after the commencement of the course and at 4 months (T2). Our main considerations in the choice of these intervals were that, with respect to T1, we felt that students needed at least 2 months study in order to acquire sufficient subject knowledge to be able to carry out the tasks, while with respect to T2 we thought that after 4 months they would have acquired suffficient familiarity with using the online tools that this would not interfere with task performance.

Except for the questionnaire, the tasks were evaluated by a panel of 4 expert raters who then agreed on a final score. In this way a kappa index of 0.87 was obtained. The criteria used to evaluate the individually written essay and the group assignment and group forum were:

- How the answer was elaborated and developed; that is, whether it showed evidence that the student had reflected on the subject content and how well she or he had integrated subject knowledge into the answer.
- Relevance and pertinence of the answer to the question.
- Originality.
- Correctness of the written language.

4. Results

Results were analyzed using an ANOVA 2 (time variables: T1 and T2) x 2 (task type: group versus individual). No significant effects were found either for the time variable ($F(1,22) = 0.31$, $p = .58$), or for the type of task

variable (F(1,22) = 0.12, p = .73). On the other hand, the effect of the interaction was significant (F(1,22) = 17.40, p = .000). We can see in Figure 1 that near the beginning of the course (T1), performance is significantly higher in the collaborative tasks than in the individual tasks (p = .005). This trend is reversed at T2, however, when performance in the individual tasks was significantly higher than in the group tasks (p = .013).

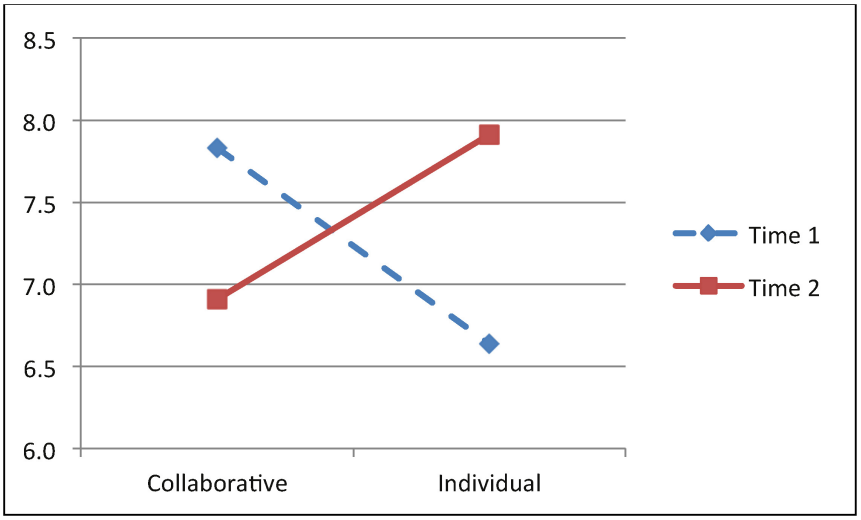

Figure 1. Performance of collaborative and individual tasks at T1 vs. T2

5. Conclusions

Those of us who work in distance learning programs know that without adequate interaction with their peers our students have very few possibilities, if any, of resolving the sort of complex problems which can be asked in learning environments requiring collaboration and co-operation (e.g., Abrami & Bures, 2009; Garrison, 1993). However, what we still don't know is what makes collaborative learning effective.

The study reported here throws up some interesting results about the possible benefits of incorporating group tasks together with other types of task into a distance learning Master course, as well as about the timing of such tasks.

One conclusion we can make is that the amount of time spent doing an online course and /or the degree of familiarity with the online tools can influence task performance. Contrary to our expectations we found that at T2, when the participants were used to using the platform and interacting online (especially through the forum and chat), their performance on the collaborative tasks diminished in comparison to their performance on the individual tasks. This result, in turn, contrasts with the participants' own evaluations made after completing each task which show a notable increase in their positive feelings towards group work after T2 compared with at T1. It could be the case that these evaluations are contaminated by their overall positive feelings towards the course in general or towards the learning tools used and they may not reflect their feelings solely towards the tasks. It should be noted here that this data did not form part of the original study and was only carried out to enable the students to evaluate the course.

On the other hand, performance on the individual tasks improved at T2. We believe there are two possible causes for this; the first concerns the students' motivation towards the individual tasks which perhaps increased due to their positive experiences with the collaborative work and to the dynamics of online learning. In other words, there could have been a kind of transfer effect. The second could be related to the students' own beliefs about what was expected of them at a Master level compared to on an undergraduate course. In this respect, and bearing in mind possible future research, we believe it would be interesting to analyze, for example, the role of collaborative work (as

opposed to other types of task) taking into account the academic level of the participants or their previous experience with group work.

A further factor which might have influenced the results is the timing of when assignments were to be completed. In our study, the deadline for handing in the group and individual assignments was the same, and we believe that as the course progressed the students gave more importance and dedicated more effort to completing the individual tasks to the detriment of the collaborative tasks. A different timetable might have eliminated this bias towards finishing the individual work.

Nevertheless, it is clear that students' are more than willing to participate in collaborative work and that this type of learning program can bring with it considerable direct and indirect benefits. But many questions still remain. Is there an optimum time to introduce group work? How might requirements carry out other types of tasks influence performance? Do individual variables (such as age, gender, culture or academic background) play a role in performing individual and collaborative tasks in an online learning environment? Are there correlations between individual variables and variables such as time or task type or other social aspects and how is learning influenced (if at all) by these factors? There is no doubt that considerable challenges for further research lie ahead.

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