María del Carmen Llorente Cejudo,
Julio Cabero Almenara
Spain

Blended Learning: Attitudes, Satisfaction, Academic Performance and Online Communication in Processes of University Training

Abstract

The main purpose of this study/paper is to get to know the attitudes, satisfaction, and academic performance of undergraduate students who participate in Blended Learning courses as well as their use of online communication tools. A quantitative and qualitative methodology of the collection and analysis of data (questionnaires, discussion groups and analysis of online communication) was used to understand how this new training method was developed in 334 undergraduate students. Students showed a positive attitude toward the internet and the method was presented as satisfactory for students and it appeared to increase academic performance. Results showed that the uses made by students in discussion forums were fundamentally focused on social and informal aspects.

Keywords: *blended learning, students' attitudes and satisfaction, online communication*

1. Introduction

The gradual, but in turn indispensable, incorporation of ICT in a university context is creating new necessities that focus on the appearance of new decisive variables in the teaching-learning process, as well as the necessity of studies that guide and establish theoretical-practical models to approach these new formative methods supported in telematic nets.

Diverse studies (Donnelly, 2010; George-Walker and Keeffe, 2010; Motteram, 2006) have been conducted around B-Learning training methods, showing high student satisfaction. This satisfaction is related to time-space flexibility and good access to all course materials. A stronger assumed sense of community was also observed among participants, and improvement was provided in tutorship systems. Among diverse studies we can observe that, in a general way, blended learning is presented as an option with a great quantity of positive valuations. Through a blending-learning study at Sheffield Hallam University, where the main objective was to investigate student learning and its development, Aspden and Helm (2004) considered this methodology and wanted to find out if it influenced relationships between students and other aspects of their own learning. Their results showed that this modality was a viable methodology in different situations, allowing students to fulfill different proposed activities in a more flexible way, depending on the peculiar circumstances of each one. If it is used in an appropriate way, the effectiveness of a mixture of face-to-face sessions and online sessions gives students the opportunity to establish connections between their learning experiences and their particular necessities. If for any reason it is impossible for some students to go to campus they can develop their work in an independent way and, at the same time, they can maintain contact with their partners and with the institution. The present article investigates B-Learning modality and how it influences students' attitudes, satisfaction, academic yield and online communication, and also whether it is perceived as positive / beneficial from the professors' point of view.

2. Methodology

The first thing necessary to point out is that the study was carried out during four months of the 2006/2007 academic year, more concretely, between February and June, in different subjects selected for the experimental part of the research, specifically those of New Applied Technologies to Education, of Faculty of Education, University of Seville (Spain).

Participants

The selected subjects were studying using the B-Learning modality, always under supervision. A total of 332 students were enrolled in subjects developed under the B-Learning modality during the 2006/2007 academic year in different specialties: Elementary Education (45), Childhood Education (152), Musical Education (63), Special Education (54), and Physical Education (38). It is necessary to point out

that approximately 50% of the students were aged between 19 and 21, and that 80% of them were female, while 20% were male. Most of them had had no previous experience of online training (91.7%) and 79.9% had internet access at home.

Data Sources:

The procedure for collection of information was structured by the following instruments:

- Students' attitudes toward the internet: Through Osgood's Scale of Attitudes with semantic differential construction, using a seven-point scale (1 = extremely positive; 7 = extremely negative). Examples of bipolar adjectives include: quick-slow, expensive-economical, necessary-unnecessary, useful-useless.
- Academic performance: objective type tests were designed, composed of 21 items, 18 in relation to memory objectives, 3 related to understanding, and 3 to application, with two application times: pretest and postest.
- Students' satisfaction: an "Undergraduate student satisfaction questionnaire toward the blended theory" was created, which contained 38 items using a four-point scale (4 = Strongly Agree, 3 = Agree, 2 = Disagree, 1 = Strongly Disagree), and different open-ended questions.
- Discourse Analysis: messages submitted to online discussion forums were analyzed through the construction of a system of categories based on different models used in similar studies (Cataldi, 2005; Cataldi and Cabero, 2006; Perera, 2007).
- Professors' perceptions: to find out teachers' opinions concerning the B-Learning modality, we ran a discussion group, a protocol / discussion guide for this purpose.
- Finally, students were asked to provide demographic information about their age, sex, specialty, previous experience in online training, and the possibility of having a computer with internet access at home.

Methods of Analysis:

To analyze the variables that were the object of the study, we carried out an analysis of diverse studies; that is to say, we developed different studies regarding the same sample to analyze the effect of the mentioned main variable: academic performance, grade of satisfaction, attitudes toward the internet, etc. In general, this type of study is characteristic of the first stages of the development of research and, according to Bisquerra (2004, 197), it prepares the way for configuration of new theories or research, it centers its performance on determining the "whats"

of an educational phenomenon, and it is not limited to a mere collection of data, but rather it tries to respond to questions on the present state of any educational situation with implications that go beyond the limits set by the studied elements. On the other hand, a correlational study seeks to establish and to evaluate the existing relationships among different variables that we have identified starting with different studies that can be influential in the process of acquisition of information, and can also end up establishing significant relationships in an online training context. We also develop a qualitative study referred to as analysis of interaction that students establish with tools of asynchronous communication of training in net. And lastly, an experimental method was used, referring to the effect that e-learning has on the academic performance of students. Therefore, we should point out that, as Arnal, Del Rincón and Latorre (1992, 102) suggest, with this type of study the ideal goal of the researcher is that changes or variations in values of dependent variables (in this case, academic performance) are due to manipulations of independent variables (online training) and not to other variables.

3. Results

The following sections summarize the results of our study through different analyzed variables, which, as pointed out previously, were: students' attitudes toward the internet, undergraduate students' satisfaction with B-Learning training, students' academic performance in B-Learning training, and teachers' perceptions about B-Learning modality.

Findings from Students' Attitudes toward the Internet:

The fundamental purpose of this study was to investigate the undergraduate students' attitude towards the internet, identifying if this had changed between their initial and final one, and if correlations could be made with satisfaction and with academic performance. Concerning the initial CAAI, we could see that, in general, there was a positive attitude towards the internet, with a mean of 5, and a typical deviation of 1.441. Therefore, it is possible to affirm that students, before beginning their training in hybrid modality, had had a favorable attitude towards the internet. This positive attitude towards the internet can be observed in descriptions using adjectives such as Useful, with a mean of 6.03, Necessary with 6.01, or Informative with a mean of 5.99. In the same way, the lowest values, and therefore a less positive attitude, were shown when students used adjectives such as Addictive, with a mean of 3.71, Expensive with a 3.83, and Dispensable with a mean of 4.58. Regarding the

results obtained between relationship attitudes and academic performance, that data demonstrated that there was no relationship among these variables, as 91% of the students in the sample declared they had not had any previous experience with training through the internet.

Students' Academic Performance in B-Learning:

In the study, we understand as academic performance memory capacity, understanding and application, so much visual as conceptual of different contents presented in different topics of formative experience through net, supporting in Bloom (1979) and D'Hainaut (1985) classifications about them, and that revolved around the first three categories: knowledge, understanding and application. The results obtained allowed us to affirm that the students who participated in our experiment had acquired learning from the three main established categories, which allowed us to confirm one of our fundamental objectives and point out that training strategies in B-Learning modality help students to improve academic performance.

On the other hand, analyses carried out allowed us to confirm another of our high-priority objectives, namely that the performance of the students in different analyzed dimensions increased once formative experience through the B-Learning modality was carried out; it was even completed for all and each one of the specialties that constituted the sample of the research (Childhood, Musical, Special, Elementary and Physical). Summarizing, what we can infer from this data is that significant differences in the increment of the students' learning exist if they have participated in B-Learning, and in addition, this increment has nothing to do with the professor who teaches the subject.

Findings from Students' Satisfaction in the B-Learning Modality:

First of all, we want to point out that six high dimensions were contemplated in the questionnaire proposed to identify the students' satisfaction ratings in our B-Learning formative experience: a) Students' general aspects; b) General aspects of the subject; c) Aspects related to the online professor-tutor; d) Aspects related to contents; e) Aspects related to online communication; and f) Aspects related to the platform.

To continue, we show the most significant results found for each of the above-mentioned dimensions.

First, with regard to the students' expectations, although at first the students had low expectations of the new modality of learning, subsequently these were modified towards more positive values. On the other hand, these positive values

were established once the students were consulted after having completed the training process.

With respect to general evaluation of the subject, the first thing we have to point out is that values near 3 show that, in regard to general questions on the subject (more concretely, on the adaptation of the program, as well as on the usefulness/ utility of essays and of practical work), the students were very positive, with means of 2.91 and 2.97, and where modal punctuation was in both items of 3.

Questions linked to the teacher obtained a very high punctuation, except in one of the items analyzed, namely the one that made reference to this idea "The Professor-tutor carried out an appropriate animation and it stimulated participation". However, the students showed average values of around 3 or above, which means that their answers were focused on the option "Agree" and, in some cases, near "Strongly Agree". This clarifies that, taking into account that all items highlighted the online professor-tutor's positive functions, the data show that the faculty were valued in a very positive way.

Students' satisfaction with regard to the contents of the B-Learning formative experience was positive, with high values above the mean of 2, near to 3. It is noteworthy that they were the lowest values in relation to the other dimensions and that in accordance with the students' perceptions the problems were not so much in the quality of the contents, but possibly in its structuring and volume.

The dimension "Aspects related to Communication" obtained the value of 3.06, with a typical deviation of 0.737. This denotes, again, a high level of student satisfaction.

Aspects related to platform (WebCT) with a mean of 3.07, and with a typical deviation of 0.647 were valued positively by the students. Consequently, the students considered appropriate technical elements of the environment.

Findings from Computer-Mediated Communication in Discussion Forums:

A total of 4,599 messages sent by the students following different subjects in our study were analyzed. These messages were analyzed with a system of categories based on Garrison & Anderson (2003), Cataldi (2005), and Perera (2007), and we proceeded to generate our own categorization system using four high dimensions: Social, Cognitive, Didactic and Technological. Interventions made by the students were analyzed in two high sections: those sent to general discussion forums, and those corresponding to thematic discussion forums. Table 1 shows dimensions, categories and subcategories for each of these as well as the obtained appearance frequency.

Table 1. Category system

Dimension	Category	Subcategory	Frequency	
			General forum	Thematic forum
COGNI-TIVE	Initiation	Recognize the problem	4	0
		Sense of puzzlement	47	27
		Initiating arguments	19	3
	Exploration	Divergence from group	6	2
		Divergence from message	2	2
		Information exchange	2	1
		Reconsideration of suggestions	3	1
		Request information	101	98
		Facilitate information	46	17
		Contents problems	8	26
		Facilitate bibliography, webs	6	4
	Integration / Construction	Agreements with partners	52	39
		Agreements with a message	2	0
		Specify ideas	39	39
		Propose solutions	20	20
		Contribute ideas	155	161
		Contribute metaphors, examples	4	15
		Accept ideas	3	0
		Extract conclusions	6	2
		Appreciate solutions or explanations	69	57
	Problem Solved	Apply solutions to the real world	2	0
SOCIAL	Affective	Expression of emotions	24	8
		Use of humor	173	23
		Risk-free expression	276	12
		Critic	4	2
		Play jokes on partners	3	1
	Interactive	Use "replay" to a message instead of beginning	994	534
		Formulate questions	18	0
		Congratulate and value writings of others	7	4
		Express agreement with somebody	21	1
		Encourage participation or present challenges	10	2
		Appreciate answers or offer solutions	2	0

Dimension	Category	Subcategory	Frequency	
			General forum	Thematic forum
SOCIAL	Cohesion	Mention own name in the messages	317	139
		Salute	34	2
		Support	2	1
DIDACTIC	Organizational and Instructional Design	Establish the program	4	3
		Establish parameters of time	4	0
		Use media	2	0
		Establish norms	1	0
	Facilitate Discourse	Encourage, recognize, reinforce a student's contribution	3	0
		Promote participation, discussion	2	0
		Value process effectiveness	17	2
	Task	Clarification	140	122
		Demands	85	101
		Support	3	0
		Scheduling	10	10
		Evaluation	15	1
	Instructional Management	Formulate and replay questions	121	3
		Intervention reaction	3	0
		Correct, express authority	0	7
		Reaction to valuation of the intervention	1	1
		Support	0	1
		Focus on discussion	4	13
		Summarize discussion	0	1
		Confirm that it has been understood	5	20
		Diagnose mistakes	0	11
		Re-plan technical questions	4	2
TECHNOLOGICAL	Use of tools	Problems and difficulties with the use of tools	57	31
		Propose solutions for problems or difficulties with the use of tools	36	18
		Negative valuations of platform and tools	1	3
	Net or System	Problems and difficulties	3	2
		Negative valuations	1	0
TOTAL			3.003	1.596

Several points to highlight are:

a. The number of messages obtained in "General Forum" duplicates the number of messages obtained in "Thematic Forum", which suggests the importance that the students attached to this category.

b. The students frequently used forum tools to address social aspects of character more than cognitive or didactic aspects.

c. Overall, the students frequently used forum tools to Request information and Facilitate information, just as we can observe in the following example: "Hello, I am unsure about the first task of theme 9: the valuation that is made of the two uses of the Net. It's not like in the questionnaire of topic 3 where it was necessary to make a kind of numeric valuation. Thank you" (General Forum.txt – 1:116)

d. We think it is worth making a remark about the social dimension. We refer concretely to Narration of daily life aspects and Use of humor, which had much more significant and higher values regarding the other ones.

e. To conclude, the subcategory that obtained the highest index of frequency and percentage of appearance (f = 994; % = 94.48), and also had the widest margin of difference compared to the other subcategories was *Uses "replay" to a message instead of beginning*. We can obtain different answers environment to questions that they think about as a continuation of initiation of a sent message, such as: answers after a question to resolve doubts – of a professor as well as of a student – respond to topics of activities –with a high appearance frequency – answers from partners about organization, about platform, or to corroborate some intervention.

Findings from Professors' Perception of B-Learning processes in their Subjects:

The professors, through a discussion group, gave us qualitative and significant information on diverse elements that encouraged or hindered formative action, as well as to know how teachers perceive utility of imparting the subject in a virtual environment of low teaching-learning blended modality. We highlight some of the significant results:

a. Categories with the highest percentages in interviews were: "Valuation" with 37.32%, "Suggestions" with 14.44%, "Attitude" with 12.04%, and "Difficulties and Limitations on incorporation of mixed methodology", with 10.82%.

b. The teachers said that the students went into this experience with little knowledge about B-Learning or e-learning training modality, as well as with insufficient skills in the use of virtual environments: *"P 1: transatlas.*

   txt – 1:81 (393:394)   Codes: [CPrevios]. There were students that in 99%
   had not done an online course before and entering in a digital platform
   is to simplify it".
c. The tutors perceived an attitude change in the students during the
   course, and if at the beginning attitudes were not completely positive, at
   the end the great majority had positive attitudes.
d. The teachers highlighted two issues: in the first place, the high participa-
   tion of the students through communication tools; and in the second
   place, the professor was not only "responsible" for solving doubts, but
   rather among the same partners solved many doubts.

4. Conclusions

As many students as professors showed a positive attitude toward the training
processes of the Blended Learning type in university teaching (Llorente, 2008;
Precel et al, 2009; So and Brush, 2008).When the students' and professors' attitudes
toward the hybrid model were studied, in general, the results allow us to say that
there was a positive attitude toward this modality, although with certain limitations
in regard to links between working on the net and actions related to entertainment
and leisure, or to the necessity of having an internet connection at home.

It is relevant that it was impossible to find significant differences between men
and women in relation to the attitudes shown toward the internet; this is a finding
that coincides with (Henríquez, 2005) and differs (Cabero et al., 1991) from other
studies in relation to the same topic. Also, the fact that the initial attitudes of the
students were inferior to the final ones allows us to conclude that participation in
internet formative experiences is an appropriate resource to training, improves
attitudes that undergraduate students show towards a given subject.

On the other hand, the academic performance of the students increased the
cognitive levels studied (knowledge, understanding and application), but it was not
possible to establish significant relationships with other variables such as students'
attitudes or satisfaction (Wu and Hsia, 2010).

Regarding how students use asynchronous communication tools it was proved
that basically they were employed in a social way or to request and facilitate infor-
mation about doubts or problems that arose in the development of the subject,
with lower use in relation to contents aspects.

The presented study has certain limitations that need to be taken into account,
e.g., whether the students had adequate skills to study and work with and through

the computer screen and, of course, with a resource that they associated with entertainment, i.e. the internet. In the same way, we think that it would be convenient to repeat the study with different samples, in other subjects, and in different universities.

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