STUDENT EXPERIENCES IN A COURSE BLENDED LEARNING

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Abstract

Fascination is a project for design students, developed jointly by the Technical University of Catalonia (UPC) and the University of Technology Thonburi (KMUTT), which works with two groups of students, one group of participants in Spain and another group in Thailand where, hands-on activities, a range of technologies are used to prepare students for the lessons, through learning activities and content.

This research paper presents the test of both a general model and a tool for measuring the participants' experiences in a course that uses a blended learning methodology, with the aim of collecting empirical evidence to justify the effort of applying this methodology, based on the participants' satisfaction. The procedure used in the conceptualization of the survey, the generation of topics, the collection of data, and the validation of the scale of various items are described here. The information, provided by the 26 people surveyed about the course and the virtual environment that was used, was analyzed to measure their perceptions and explore possible relations. Finally the conclusions of the research and the future work are presented.

Keywords - Blended learning, Design, Course evaluation, Learner satisfaction, Learning environments, Instrument development.

1 INTRODUCTION

The degree of satisfaction of students with the courses they take has played an important role in assessing the efficacy of distance-learning processes. The literature shows studies where the experiences of students using e-learning shows no statistical difference from traditional education in terms of satisfaction [1]. While one series of studies has examined the experiences of affective learning, with distance-teaching courses [3], there are few studies that focus specifically on the satisfaction of the students with blended learning. The possible reasons for this phenomenon are to be found in the study by Hara and Kling [9], who suggest that the students may not have the opportunity of expressing their feelings about the teaching and despite having suffered problems in the learning processes, they are not capable of expressing their feelings with respect to the course, concerns about their tutors or the time allotted to assessment. Another reason is that the researchers may have positive opinions about blended learning and tend to assume that the students are satisfied with the quality of the course. Measuring the value of an e-learning system is not possible using a single scale of global satisfaction; different aspects of the student's satisfaction if a useful diagnostic tool is to be obtained [17].

2 DESCRIPTION OF THE COURSE

Fascination is a project created between the Technical University of Catalonia (UPC), in Barcelona and the University of Technology Thonburi, in Bangkok (KMUTT). It consists of a course in which the main approach is to work is working with two groups of participants, in this case one group of students from Spain and another group of students from Thailand.

Each group works under the permanent guidance of a specialist designer who acts as a tutor, and they receive support from two consultants, each one is located in the place of origin of the students. The aim is to produce virtual objects that reflect a synthesis of the two cultures, thereby acquiring skills and acquiring knowledge connected with the area of design.

It is aimed at design students located in the cities of Barcelona and Bangkok. The language chosen for the course was English, since it is, a language that is known by most of the participants. The data obtained was collected from the registered students, a total of 26 participants. Forty per cent were females with an average age of 25 years and 60% were males with an average age of 25 years. The survey with which the course satisfaction data were obtained was filled in by 100% of the participants.

The course follows a blended learning methodology, which combines hands-on activities and on-line activities. Because of this the use of communication technologies was a key point in the running of the project. For that reason, a virtual environment was used that provided the students with different functionalities: e-mail, debating forum, and recommended links.

1.1 Activities

The course is divided into in the following activities:

1. Introduction. Tutors and students make a presentation using the meeting point, a place with videoconferencing so that the participants from the two countries can meet their classmates. The tutor explains the methodology and makes the introduction. The technology used in this point allows the students to interact by on-line chatting and getting to know their companions by means of video and audio. The virtual environment is the place for publication of documents that show the programme for the course and the educational materials.

2. Organisation of the work. The work is distributed among groups of two people, and the topics to be dealt with both in individual and in group work are distributed. The group consists of one student from Thailand and one from Spain. The information is published in the virtual environment. As well as the Chat facility, the students have a debating forum in the virtual environment where they take part by reviewing the contributions made by their companions and making their own.

3. Syllabus. The students follow the formal syllabus that has been set, and perform asynchronous self-learning activities in the virtual environment, participation in, videoconferences in the conferences area. As well as watching the material on the website, they can download the educational contents through podcasting, which makes it possible to view them later in a mobile device. Linked to of videoconferencing activity there are extracts from the bibliography related to each of the topics, which is accessible in bibliography.

4. Collaborative work. Three more sessions are set up in the meeting point to show all of the participants the information with respect to the results obtained by each group and with respect to the individual project that each student does. The tutor will discuss the projects in the meeting point with the intention of all of the participants giving their opinions and contributing their experiences in the session. It is important to mention that the projects are based on ideas that will be reproduced later by well-known companies at international level. The case of companies such as Lladró, Camper and Loewe, which participate in the course, means that the students have an additional motivation. The principal goal is for all the material that is developed can be used by the companies, bringing the business sector closer to the young designers in the university framework.

5. As the participants finish with the activities, they are made available to others for free consultation. This is done through the handover area in the environment virtual.

1.2 Methodology

The course follows a blended learning methodology, which combines didactic strategies and multimedia tools in the activities designed for the students. According to Osguthorpe and Graham [10], pedagogical richness, social interaction and facility in the review are achieved. Its main aim is:

1. To combine the modalities of learning [14, 16].

2. To combine methods of learning [13].

3. To combine attended learning and on- line learning [11, 18].

The characteristics of the methodology applied in the course are as follows:

- Defined learning goals. The programme is explained by the course goals. These goals derive from the performance in work and reflect the competencies to be learnt, as part of the successful implementation of a course. The effectiveness depends on the goals being well defined.

- Activities groped by modules. Vigotsky's constructivist theory of learning [7] indicates that instruction must be structured so that it can be taken in easily by the student. The organisation of modules responds to a strategy for doing increasingly complex activities, which optimises learning in accordance with Reigeluth and Stein's [12] theory of elaboration

- The students do a collaborative project. They do a project in pairs which is later shown to the whole group and will be assessed for development by the participating companies. The Theory of Commitment [8] is taken into consideration.

- There are a number of channels of asynchronous virtual communication and collaboration among the participants. The communication between the tutor, the participants and the administrator takes place through various conversation and collaboration tools such as: email, forum, chat, videoconference [6].

- Real case studies. The learning of the design is based mainly on the paradigm of problem-based learning. The course makes use of this principle through video-conferences with designers renowned in their fields that relate experiences and explain methodologies and processes of creative work. This is coherent with Knowles's theory of Andragogy of [7] according to which adults' learning is problem-centred rather than content-oriented. The presentation of the contents in this format stimulates learning and converts it in to a significant process, the level of processing is higher and more information is retained, in accordance with the theory of levels of processing by F. Craik and R. Lockhart [7]. In addition the appropriate use of multimedia, stresses important points, stimulates the imagination, clarifies relations between concepts and fosters study of topics of interest.

Moreover, following Mengoni, Germani, and Mandorli, [9] we propose methodologies based on reverse engineering to speed up the design process.

- Associated activities and bibliographic content. The students can at all times consult the bibliography and recommended links, but also activities such as the videoconferences have an association with extracts from the bibliography and recommended links in general. Tobin [15] points out that students attach much more value to on-line access to a variety of reading and reference material. For Gotthardt [5] the content must be adapted to the knowledge that the students are acquiring throughout the course.

- Space for discussion between the students and the tutor. In each case study there is a space for debate, moderated by the course tutor, in which the student presents his/her work and expresses considerations, doubts, queries and comments. This process takes place by videoconference, in which the students located in Thailand interact with the group located in Barcelona. This space, is basically a meeting place to debate the contents of the cases, share experiences and clear up uncertainties.

For Cook and Dupras [4] the tutor must provide feedback through synchronous or asynchronous communications. Benigno and Trentin [2] point out that the interaction of the participants is the key element of online courses and they state that interactivity produces benefits in the learning and that the asynchronous interaction stimulates profound reflection about the contents.

2 RESULTS

Wang [17] explains that in order to evaluate the scope and the specific nature of student satisfaction concerning the different dimensions in a virtual environment, theoretically and operationally defined, the instrument must be designed to capture multiple aspects of the student's satisfaction and provide a diagnostic tool to assess the online learning activities.

The tool used to measure satisfaction is a 47 question questionnaire administered to the students at the end of the course. It is divided in 3 sections: general information, quantitative section or main body of the exploration (with five-level Likert items) and a qualitative section. The qualitative section contains questions grouped in eleven scales measuring:

-Motivation in doing the course (mot);

-Access (acc): measures the ease with which the student enters the virtual environment at the most convenient times;

-The general skills (hab): measures the degree to which the course adds general skills to the participants;

-Appropriate work load (cta),

-Curriculum (cur);

-Interaction (int): measures the flexibility and quality they have in accessing the virtual environment;

-Clear goals (met);

-Learning resources (rec): determines the services and technological resources;

-The response scale (res): measures collaborative organisation;

-Results (ret): measures the contents of the lessons in terms of their development, presentation and quality; and

-The satisfaction scale (sat).

The works of Prosser and Trigewell confirm the usefulness of applying scales in different focal points of the learning, associated with the experience of the students referring to a course. This tool is called DCAQ (design course assessment questionnaire).

The variables described in table 1 were taken into account. The tools for measuring the variables are:

1. The system logs for the participation variables. A record is made for each student of the visits made to each of the activities of the virtual environment used in the course.

2. The participants' results scales related to the course.
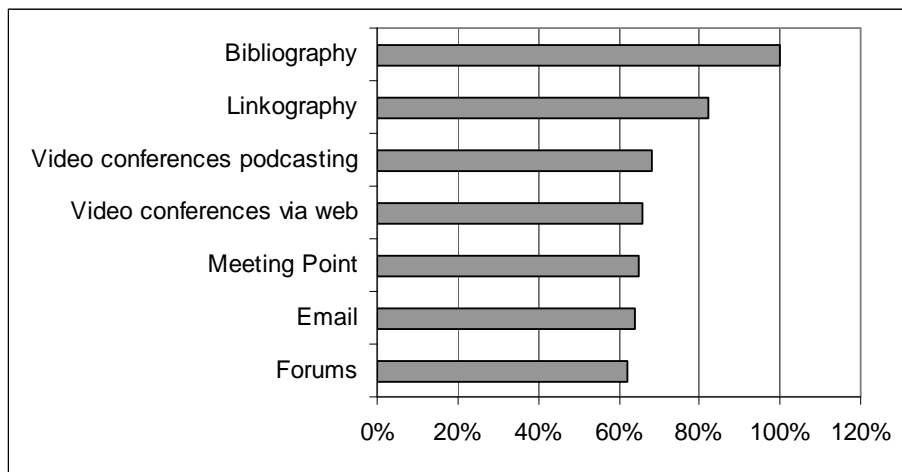
Table 1. Variables measured in the DCAQ

Participation Variables
Synchronous virtual collaboration
Video Conference in web (vcw)
Meeting point (mp)*
Asynchronous virtual collaboration
On-line debate forums(fo)**
E-mail (em)***
Asynchronous self-learning
Bibliography (bi)*
Linkography (lk)*
Podcast video conferences (pd)*
Results variables
Motivation (mot)
Access (acc)
General skills (hab)
Appropriate work load(cta)
Curriculum (cur)
Interaction (int)

Clear goals (met)

Learning recourses of (rec)

Response (res)

Results (ret)

Satisfaction (sat)

*Number of visits. ** Includes the visits, publishing, reading corresponding to messages. *** Includes receiving or sending messages.
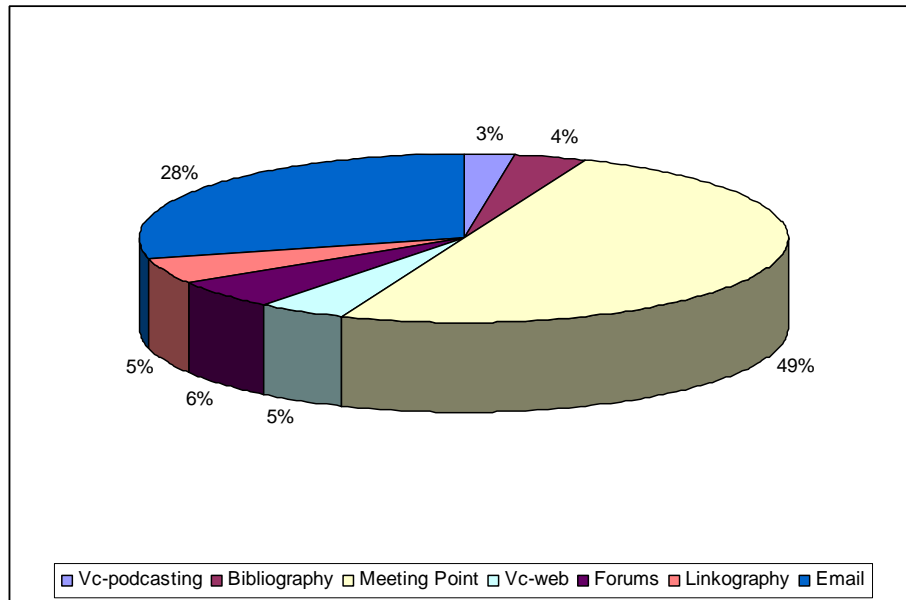
The figure below shows the percentage distribution of the participation of each activity with respect to the total participation in the course activities.

Fig 1.Participation in the course activities

These results show a high participation in the videoconferences via Web, whereas participation in e-mail remains very close to the participation in videoconferences via podcasting, linkography and forums. In fact, both in the forums and in the qualitative section of the questionnaire the students valued the video material positively.

Fig 2.Activities by a student in the virtual environment

Also the possible relations were explored between the participation variables of and the result variables. For the relations between the variables the Pearson correlation coefficient was calculated. Table 3 summarizes the results obtained and shops how the Motivation scale (mot) correlates positively with participation in web videoconferences (vcw), the Meeting point (mp) and the podcast conferences (pd), the resources scale (rec) shows a negative relation with participation in the videoconferences (vc-pod), and finally the satisfaction scale is related positively with participation in forums (fo) and the podcast videoconferences (pd) and negatively with the bibliography (bi).

Table 3. Pearson Correlations of for the measured variables

	vcw	em	lk	bi	mp	fo	pd
mot	0.83 **	-0.02	0.24	-0.27	-0.41 *	-0.15	0.47 *
acc	-0.13	0.15	-0.23	0.24	0.07	-0.38	-0.08
cta	0.12	-0.25	-0.33	0.09	-0.23	-0.37	0.03
cur	-0.22	-0.31	-0.06	0.15	-0.13	-0.37	-0.19
hab	0.14	0.29	-0.23	0.16	-0.03	-0.23	-0.04
int	-0.23	-0.08	0.07	-0.10	-0.25	0.14	-0.03
met	0.29	-0.13	0.40	-0.06	0.16	-0.26	0.18
rec	-0.11	-0.07	0.19	-0.09	0.06	0.10	-0.52 *
res	-0.39	0.20	0.09	0.05	0.21	-0.12	-0.25
ret	-0.24	0.02	0.08	-0.11	0.07	0.25	-0.03
sat	0.30	0.12	0.10	-0.49 *	-0.43	0.48 *	0.96 **

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

The results obtained showed a positive correlation. The most motivated students are the ones who had the highest participation in the videoconference via web (0.83). The same happens with podcasting videoconference (0.47) though to a lesser degree, while it is seen on the other hand that there is a negative correlation between the students' motivation and participation al the meeting point (-0.41).

Moreover, the correlation between the satisfaction scale and the of videoconference via podcasting activities (0.96) and the forums, shows that the more satisfied a student is the more he or she takes part in activities.

The results also show that the use of -mail, which was seen before to be the activity in which the students participate most (58% on average), is not correlated with motivation or with satisfaction. On the other hand, videoconference via podcasting, which is the least-used activity (5% on average), is

correlated with satisfaction. This can be interpreted as showing that a little-used activity in comparison with the other activities can be related with motivation or satisfaction of the students.
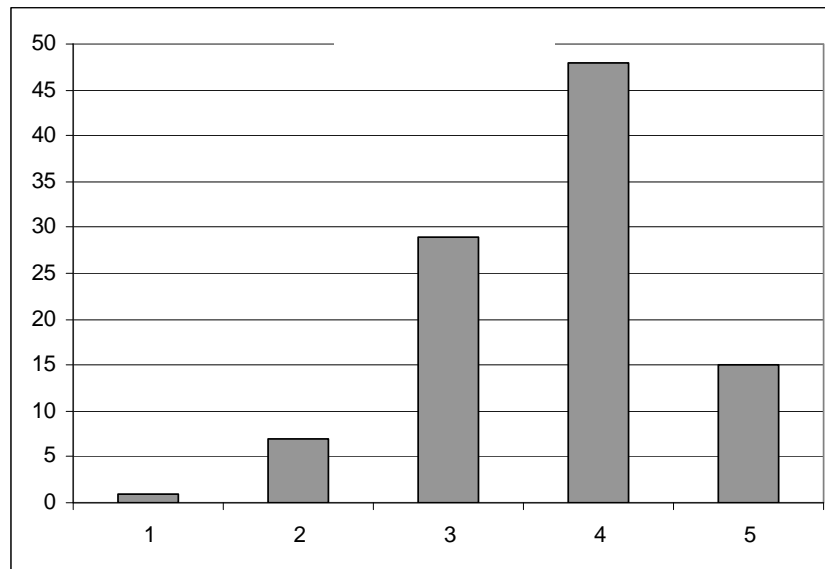
The results by scales show that 35% of the students agree that the course is intellectually stimulating and that it motivates them, whereas 27% are in total agreement with the motivation. On the access scale, 89% perceive the flexibility provided by the virtual environment to do the learning activities of at the most convenient times and 84% believe, with respect to the interaction scale, that there is flexibility and quality in accessing the virtual environment, while on the results scale 73% positively valued the organization and structure of the teaching materials available to them.

Table 4.Results (Likert scale)

	Totally disagree	Disagree	Neutral	Agree	Totally agree	Total
Motivation	1%	7%	31%	35%	27%	200
Access	0%	0%	6%	89%	5%	100
Work load	2%	23%	38%	26%	11%	125
Curriculum	0%	6%	58%	12%	24%	50
General skills	2%	4%	30%	48%	18%	200
Interaction	0%	0%	5%	84%	11%	75
clear goals	2%	20%	42%	31%	5%	100
Learning recourses of	0%	20%	20%	48%	12%	25
Response	0%	0%	14%	77%	9%	100
Results	0%	0%	11%	73%	16%	150
Satisfaction	0%	20%	36%	40%	4%	25
Total	**1%**	**7%**	**29%**	**48%**	**15%**	**1425**

Taking the total of the results table as an evaluation of overall satisfaction with the course, the graph below summarizes how this evaluation is distributed.

Fig 4.Overall satisfaction with the course

Overall satisfaction in the quantitative section, two groups of responses were obtained; the free assessment of the course by the students and their contributions to improve the course. In the first group of responses, 22 replied that the best thing about the course was the methodology used, and 10 of them thought that an important aspect was working with companies that consider the possibility of realizing their designs. "The technology used, the tutors and the organization of the course is one of

the best aspects" was the response of 8 of the students, and 26 (i.e. all) of them said that the most positive thing about the course was the possibility of exchanging experiences with a culture different from their own. In the second group, the students mentioned that they would like to see more courses of this kind organized with other countries.

3   CONCLUSIONS

It is important to democratise the opportunities for more flexible education by offering the options for delivery and providing a closer check of the students. The importance of this study lies in the students with respect to their experiences and perceptions with the blended learning, and the results provide useful ideas for anyone interested in their application and other kinds of formats of distance learning.

This project has made it possible firstly to establish a model for obtaining the perceptions of the students with respect to the course they have followed. Secondly, it was possible to obtain results with which to measure and conclude in what way the participation in activities correlates with the results obtained from the survey.

The research work undertaken from these results will be aimed at improving the methodology and the contents and to providing tools that will improve the management of the activities by the tutors.

Among the results of this work consideration should be given to the high percentage of responses obtained, 100% of the participants. This is an indicator of the reliability of the results. The formal analysis showed it to have the following qualities: It is appropriate for obtaining information it obtained conclusions with adequate internal consistency, as is shown by the Pearson coefficient. It also obtained determination in the selection of responses and made it possible to detect opportunities for improvement in the teaching activities by providing the numerical and graphical comparison between the results. Probably, the opportunity for improvement that demands implementation with the highest priority is the Curriculum and the general skills that the course provides for the participants.

The qualitative section of free comments was divided in two groups: strengths of the course and contributions. The majority of the responses were fairly positive, and it must be said that 100% of the students said that the most positive thing about the course was the possibility of exchanging experiences with a culture different from their own, while 22 of them replied that the best thing about the course era the methodology implemented. The synthesis of these comments correlated with the results of the quantitative analysis of the survey, add new perceptions that are difficult to research in a quantitative survey.

The survey and the analysis system that was used proved to be a useful measurement tool to be included as an instrument of evaluation for design studies that implement a blended learning methodology. It is planned in the future to use this tool to measure the experiences of the students in other similar courses.

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