



Digital Signage: An Experience of Innovation in Higher Education

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Abstract

This project on teaching innovation was developed in ESIC Business & Marketing School Valencia and is based on the educational opportunities provided by Digital Signage. This paper describes the different phases undertaken to implement a flexible teaching method that counted on the participation of 43 third-year undergraduate students of Communication and Public Relations during two consecutive academic years (2013-2015). The objectives of this project are to promote educational innovation through the creation of a work structure led by teachers and to encourage students' independent learning in the process of constructing knowledge through the development of the most appropriate visual designs for the transmission of information and advertising messages from the school. To achieve this, students have used Photoshop, Flash and Premiere software. The obtained results show that this project helps to encourage assimilation and implementation of key concepts in the field of creativity, graphic design and content management. The project also supports that teachers involved in the project should improve education quality by pooling and making the most of the best practices they have implemented on new methodologies in teaching and the development of their subject matters.

Keywords

Digital signage; intra-university management and information planning; teaching innovation; teamwork; independent learning

1. Introduction

The creation of the European Higher Education Area (EHEA) implies various and profound changes in teaching. Baena and Padilla (2012) consider that the most substantial change might consist in the harmonisation of qualifications across Europe in order to be adapted to the current and future needs of students and the labour market. However, an essential aspect of the EHEA, which lies at the basis of this innovation project, is to improve teaching quality in universities and boost student skill acquisition (Cano, 2008). The evolution of the training needs that society demands has encouraged institutions of higher education to implement an educational strategy meant to ensure students' access to knowledge and skills for lifelong learning. In this context, it is essential to achieve flexibility in teaching methods in order to adapt them to the skills that students must possess. Therefore, universities should promote innovative experiences in the teaching-learning processes in order to train students in the skills they will carry out in their professional life, since the current labour market is characterised by being rapidly changing and competitive.

This statement is endorsed by the Framework Document on the Integration of the Spanish University System in the EHEA that emphasises the necessity that European-accredited qualifications should provide access to the labour market. The educational objectives of the official undergraduate training will generally have a vocational orientation, i.e., they must provide university education with a harmonious integration of core generic skills, transversal skills related to the comprehensive personal development and more specific skills for vocational orientation that should ease graduates' integration into the labour market. In this regard, it is imperative to harmonise the design and development process of the official undergraduate training and the officially recognised qualifications in other European countries in each of the scientific, technical and artistic fields. At the same time, there must be a close collaboration between academic coordinators and those in the associations and professional bodies (Ministry of Education, Culture and Sports, 2003).

Canzer (1997) points out that teachers should support students in their acquisition of skills and make sure they will be able to apply them in their professional field. Similarly, there is evidence that students who work together and collaborate in the achievement of their goals develop skills and competencies that the traditional method can hardly provide (Exley and Dennick, 2007). Wright et al, (1994) agree with this line and emphasise that active student learning can originate skills like leadership, teamwork and task distribution; on the contrary, a passive learning hinders acquisition. Baena (2010) stresses the advantage of developing active learning, which should make students lead their learning process for their satisfactory integration in their workplace. Thus, the classical teaching-learning structure based on a lecture given by the teacher and in which students act as passive recipients should be replaced by a strategy to encourage their active participation. The mere transmission of knowledge and procedures must give way to a

scheme of acquisition of new skills, abilities and competencies through self-learning (Martin et al, 2014).

This new situation can be possible with the introduction of innovative teaching projects that include practical work sessions, debates and seminars where students can have a dynamic personal and team interaction that should lead to the acquisition of skills that, in turn, will help them to lead their own learning (Whitehead, 2008). To achieve that, university teachers should alter their relationship with students, so that the vertical teacher-student hierarchy should be replaced by a horizontal structure where the teacher mainly plays the role of an advisor (Criado and Moreno, 2009).

This paper describes the different phases carried out to implement a flexible teaching method that should provide students access to the skills and abilities to work in advertising, marketing and communication. The objective of this project is to promote student autonomous learning of these subjects by developing the most appropriate visual designs for the transmission of informative and advertising messages in the school.

2. Description of the educational innovation project

Digital Signage (also called Dynamic Marketing or Dynamic Communication) is a system of communication frequently used in the field of digital advertising that allows management, distribution and multimedia content display through various screens. In any case, all terms converge towards a single concept: a communication vehicle that replaces the traditional advertising poster with a "digital sign" that can stream video and reproduce multimedia contents. For this reason, the result of this innovation project is an "audio-visual poster" created and programmed by students. For this purpose, students use graphic design applications, specifically, Photoshop, Flash and Premiere software. Digital Signage becomes therefore a novel communication channel based on digital content.

This instrument provides the basis for the construction of this educational innovation project because it is currently a very popular communication channel for digital content in business. The Research on Total Investment in Digital Advertising in 2013, prepared by IAB Spain, includes for the first time the investment in Digital Signage, which is above € million (€6.1 million), which means almost 1% of the total digital investment.

Digital Signage has two major advantages. Firstly, the information is not static, since the user can be exposed to different messages that change in a given period of time. Secondly, the content grid can be managed automatically from a single source of emission, which means that messages can be programmed or changed in real time from a single computer and displayed in different formats enabled for this purpose. All these factors allow the creation of a communication channel of its own.

As it is adaptable to the needs of each organisation, Digital Signage offers diverse functionalities such as corporate communication, the transmission of informative messages and live or recorded events. In the present educational project there are three communicative alternatives disseminated through television screens.

The main objective of this educational innovation project is to create a flexible teaching method that should encourage the implementation of essential key concepts in terms of creativity, graphic design and content management in order to enable learning professional aspects.

On balance, Digital Signage is considered a tool that adapts to the acquisition of skills required by students. In this case, the new information and communication technologies are closely linked to fields like marketing and advertising. In addition, this experience requires not only the active collaboration of students and the involvement of teachers, but also the cooperation of the whole educational structure. In fact, the novelty of this project consists in the commitment of the university to assume it as a global initiative that involves students, teachers and administrative staff. The different areas of the centre involved in the achievement of the educational innovation project were the Department of External Communication, ESIC Entrepreneurs, the Department of International Relations, the Department of In-company Training, INMETUR Innovation Centre, the Library and ESIC Language Department.

Regarding the students, the educational innovation in this project is to move certain skills outside the classroom in order to develop them in a professional environment, in this case, in an educational institution.

The educational innovation project was conducted in the third year of undergraduate studies in Communication and Public Relations in ESIC Business & Marketing School in Valencia during the academic years 2013-2014 and 2014-2015. The subject that incorporated the innovation project was Art Direction and Advertising Production and counted with the participation of 43 students. The academic departments responsible for the project were two: Advertising and IT.

The implementation of the present educational innovation project covers issues that, according to Salinas (2004), should be considered in an experience of this kind:

- A support system for teachers that includes their further training in the use of information and communication technologies (ICT) in teaching; in this case, teachers and administrative staff in the communication department involved in the project attended a seminar about the functioning of a content management software for digital marketing and advertising. They also had access to ongoing

training in order to take advantage of all the communication options this system offers and which can lead to innovations in the teaching-learning processes.

- A support system for students: students require not only training but also technical assistance and promotion policies for the use of ICT. In relation to this factor, the students involved in the educational innovation project of Digital Signage received the necessary guidelines to acquire skills in different fields: selection, information management and planning, graphic and visual design and communication skills, in order to present a digital poster on the new channel.
- Team policy: the organization of the members of the project is an essential element to consider. In this regard, the presence of a project manager in this project is relevant, as well as that of a content coordinator and a quality supervisor, who worked together throughout the process. Thus, although independently listed below, the actions taken by the members of the innovation project were always coordinated, which created synergies that enriched the project.
 - The role of project manager was to establish a protocol for all the parties involved in the project (teachers, administrative staff and students) with the aim of helping students to get naturally closer to the business side of an educational institution through activities related to the implementation of the Digital Signage communication channel.
 - The contents coordinator designed the methodology for learning and active student participation so that students could develop their own channels of communication for the transmission of university-related information. To do so, special attention was given to the teaching and learning about the necessary tools to create such information. In this aspect, students' teamwork is very important, as it is meant to help them to acquire skills that should allow them to address new situations and needs in fields like marketing and communication. The training programme also included an in-person tutorial class structured in short sessions.
 - Finally, the functions of the quality supervisor are transversal because they have at their core an action of control that evaluate initiatives of implementation of innovative methodologies for learning and active participation. The main role of the quality supervisor in the project was to prepare a questionnaire that students had to complete in order to evaluate the extent to which the project was accepted and the objectives were met.
- Network, hardware and software infrastructure: teaching based on ICT needs strategic lines aimed at creating a technology plan that should include specific resources for the development of the innovation project. In this case, the actions taken by the project manager were those of acquisition of licenses for a content management software, as well as of various screens for the transmission of the created messages. Furthermore, and prior to the implementation of the dynamic

communication channel, ESIC had equipped six computer labs with the audio-visual editing and graphics software for the development of Digital Signage material, as well as other purposes.

3. Methodology

In summary, the educational innovation project allowed each group of students to work for a week in a collaborative way on the research, selection, editing, design, planning and release of contents related to the academic year, as well as on their presentation as digital posters.

Specifically, the current project aimed at promoting measures to improve teaching quality through the implementation of active and participatory methodologies meant to facilitate and improve the teaching-learning process. This project considered the following actions:

- The development of an innovative methodology for learning and active participation for knowledge construction in order to encourage the development of autonomous learning.
- The design of active processes for skill and ability acquisition for professional practice. These processes have therefore been moved from the classroom to the real company.
- The study and design of evaluation processes according to this methodological update.
- The design and development of specific material and resources for the implementation of these new methodologies.
- The development of the tutorial activity.

Thus, the consequent methodology to carry out this innovative teaching strategy includes the following aspects:

- The development of the necessary basic skills to pass the subject of Art Direction and Advertising Production: to do this, students had to internalise the theoretical and practical concepts aimed at creating a visual work (or digital poster) so that they could later adapt it to the Digital Signage channel. In this case, it was essential for students to practice informational, corporate and advertising content development expressed in the most semantically and visually accurate way possible to communicate a message effectively.
- Use of ICT: students had to learn how to operate the content management system to create the communication channel, as well as the graphics and audio-visual editing software for the design of an appealing presentation of the message they wanted to transmit. In addition, they had full access to these tools in the computer rooms. The Digital Signage content manager - a software for programming audio-

visual posters - was set up on two terminals in the IT department in order to have direct control of its use. Similarly, the six computer rooms in the university had the necessary software for the design of audio-visual posters. On the other hand, a classroom was booked for the in-person question-answer sessions about information selection or its presentation.

- **Teamwork:** Students, in groups of three, developed and projected informational, corporate and advertising contents in a digital poster format. Cooperative learning means greater motivation for students. However, teachers have to make sure students work in teams and not allow them to work individually on their part of the assignment (Polanco, 2005). The structure of the innovation project was designed to specifically address this aspect. Thus, the guidelines created for this project underline the active and collaborative participation of each student to achieve the objective to create an adequate message for a visual composition from a communicative point of view and adapted to a dynamic communication channel.
- **Evaluation:** The assessment of the practical part considered in the syllabus of the subject involved in the project allocates 30% of the final mark to Digital Signage content design in groups. The development of highly creative and communicative contents by each team and therefore their possible release on the company's channel is a sign that the work met the parameters required by the company and, therefore, this aspect is rewarded with a more positive assessment. In any case, whether the designed posters were selected for release or not, every student had access to the software for remote content programming.
- **Revision of results:** At the end of the semester, students completed an evaluation questionnaire that assessed the degree of effectiveness of the educational innovation. Thus, it was possible to measure students' perception of the project and the extent to which improvements affected student training.

More specifically, the innovation project based on Digital Signage has the following structure:

As mentioned before, students were divided into groups of three. This planning demanded each of the members to develop relevant skills for negotiation, discussion of doubts, productive dialogue and, finally, adequate planning in order to achieve the ultimate objective.

Each group of Dynamic Marketing had to complete their work over a week, whose result was two Digital Signage posters. Thus, every Wednesday, the team in charge of the practical work chose topics on which they had to obtain relevant references that became the starting point for the messages in the digital poster. Consequently, from the data supplied by each of the departments involved in the project students had to select the information likely to become the message for the Digital Signage channel. They also set a

specific target audience for their messages (undergraduate and graduate students, alumni, etc.).

Once that the topic and the target of the message were decided, students had to develop the most appropriate communication strategy for each case. Therefore, they had to get together, propose, discuss and debate ideas in order to find the most suitable communication design for the intended content, target audience and emission channel.

After structuring the message, the group had to design the contents for its presentation in the format of a digital poster. In this case, since the messages was going to be projected on high-definition screens, the images and videos of the Digital Signage system had to be adapted to 1280x720 pixels.

After the digital posters were ready, the group had access to the content management software to learn how to operate it. The content management software allows embedding videos, texts, images, web pages, flash animations, audios, etc., so that users can combine and save them according to their needs. Through this specific software for Digital Signage channels students carried out the remote programming of the messages they had created. Their posters were included in the emission grid of the dynamic communication channel.

Finally, besides the audio-visual posters, each group presented a report on the Digital Signage practice that included the description of the planning and explanation of the created design. This report was delivered one week after the end of the practical part of the project.

4. Obtained results

The aim of the educational innovation project is to make students of Art Direction and Advertising Production work on real cases and at the same time design specific contents for the Digital Signage channel of the educational institution. This facilitates collaborative work and encourages a horizontal and egalitarian relationship between participants.

The evaluation of the objectives of the innovation project was carried out with a questionnaire based on a five-point Likert scale and was completed at the end of the term. Table 1 shows the technical sheet of the research, while Table 2 reflects the profile of the surveyed students.

Table 1. Technical sheet of the research

Universe	University students of ESIC Valencia, Degree of Communication and Public Relations. Subject: Art Direction and Advertising Production (3rd year)
Geographic Area	Valencia, Spain.
Sampling Design	Personal survey
Sampling Size	35 valid surveys
Field work	2014/12/17
Statistical Techniques	Descriptive analysis
Statistical Programme	SPSS versión 21.0

Table 2. Profile of the surveyed users

Characteristics		%
Gender	Men	28,6%
	Women	57,1%
Age	Average	22,19
	Typical deviation	2,370
	Minimum	20
	Maximum	29

Table 3. Descriptive statistical data

	Minimum	Maximum	Average	Typ. Desv.
1. I was interested in the Digital Signage project	1	5	3,60	1,090
2. My interest in educational innovation projects has increased after my experience in Digital Signage	1	5	3,77	0,910
3. I think the structure of the Digital Signage project is correct	3	5	4,20	0,677
4. The quality of the acquired practices is good	2	5	3,94	0,906
5. A more extended Digital Signage project could have been carried out	1	5	3,56	1,050
6. I find the Digital Signage Project intellectually stimulating	1	5	3,88	0,880
7. I learned things that I consider valuable	1	5	3,77	1,140

8. My interest in the subject has increased as a result of the Digital Signage project	2	5	3,83	0,822
9. I understood the communication strategies of this project	1	5	3,83	0,954
10. Altogether, I improved my collaboration with colleagues	2	5	3,69	0,963
11. I would recommend the Digital Signage Project with similar characteristics to my colleagues	2	5	3,89	0,758
12. Overall, I am pleased to have completed this Digital Signage project	2	5	4,20	0,677
13. I would like more projects of this kind to be carried out	2	5	4,20	0,797
14. I would participate in another Digital Signage project at the university	1	5	3,89	1,022

In Table 3 the following items stand out: 3 "I think the structure of the Digital Signage project is correct", 12 "Overall, I am pleased to have completed this Digital Signage project", and 13 " I would like more projects of this kind to be carried out ", being the best rated with an average score of 4.20.

In contrast, items 1 "I was interested in the Digital Signage project" and 5 " A longer Digital Signage project could have been carried out" are less valued, with an average score of 3.60 and 3.56, respectively.

5. Conclusions

Knowledge is neither final nor fixed but is dynamic and adapted to the context in which it is integrated. That is why it is essential that teaching evolve and adapt to the needs demanded by society at all times.

Students play an essential part in this project, as they have the opportunity to meet the preferences of their "client" and, thus, they can help improve their corporate image and at the same time get involved in the actual operation of a company, in this case, of an academic nature.

For Whitehead (2008) teaching should enable students to perform individual work as well as teamwork, which would allow them to become the leading part of their own learning. In this project, the practices to be developed take into account this context. In fact, by using seminars and workshops in order to properly plan and manage information coming from the centre's different departments, and by mastering tools of graphic and audio-visual creation, students have organized their own college communication channel. With this method of learning, the simple transmission of knowledge has been replaced by a

teaching strategy that involves acquiring new capabilities and skills through self-learning. In this sense, the idea remarked by Martin et al (2014) is observed.

Moreover, the relationship between the teacher and students has acquired a horizontal structure, relegating the traditional vertical hierarchy. As highlighted by Criado and Moreno (2009), in this project teachers have mainly played an advisory role. To this end, an in-person tutorial class has been developed and organised in short sessions aimed at providing students with the skills and capabilities to enable independent learning for professional practice in advertising and communication. Therefore, the objective of this project of teaching innovation is that certain competencies should be transferred outside the classroom, in order to develop them as much as possible in the professional context of an educational institution.

The overall assessment of the project is positive on basis of the questionnaires, as the creation of a Digital Signage channel encourages collaboration among students, university and administrative staff from different areas, because it sets the outcome of the assignments in open environments. Thus, students publish their creations on the new communication channel of the university. This fact motivates the collaborative and creative efforts of students under the guidance of the teacher and the indications received from the various departments of the center. Similarly, it has been shown that the structure and duration of the project of teaching innovation have been adapted to students' initial expectations.

As reflected in the results, students greatly appreciate such initiatives. However, although these results are above average, it is advisable to develop the necessary actions in a new way to encourage their initial interest in the project and, above all, to increase student teamwork. This is because, as several authors point out, collaboration among students to achieve their goals means further development of skills, capabilities and competencies that the traditional method does not provide (Exley and Dennick, 2007, Wright et al, 1994).

It should be noted that item 10 "Altogether, I improved my collaboration with colleagues" has a score of 3.69. This is an above average result, but very improvable. It is therefore necessary to determine prior to the development of future editions of this project to what extent students consider they already work together. If they believe their collaboration is adequate, it will be necessary to maintain it during the implementation of the Digital Signage project. In any case, the need to define the necessary strategies to encourage collaboration with colleagues is imperative.

As this experience was well received, the design and management of a Digital Signage channel by students can help to improve teaching quality because they can provide to a large extent skill acquisition for professional environments. Therefore, the project is also

carried out in the official degree of Business Management and Marketing through the subject of Multimedia Technologies. This innovation is being implemented over the second semester of the academic year 2014-2015.

On balance, this strategy can be considered valid to stimulate student acquisition of skills, since it encourages the assimilation and implementation of key concepts related to creativity, graphic design and content management. In addition, the teachers involved in the project can improve education quality by pooling and leveraging the best practices they have implemented in the field of new methodologies for teaching and subject development.

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