

Pictures, teaching, marketing and languages. Results of an innovative learning project based on pinhole photography

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Abstract

A pinhole photography exhibition, entitled Tinned Cities, was organised thanks to the collaboration between the University of Valencia and the London School of Economics. Students from both universities took part in an interdisciplinary project based on a real decision making process in the context of cultural management. The implementation of a market research by UV students determined the 23 pictures to be exhibited. Students at LSE were responsible for writing descriptions of each picture. Most of the pictures selected represent icon cities. In order to test students' participation, motivation and satisfaction with this innovative project, we undertook a quantitative research. Results showed high levels of participation, motivation and satisfaction. Artistic black and white pinhole pictures have been successfully used as a pedagogical resource.

Keywords

Pinhole photography, interuniversity cooperation, problem-based learning, Content and Language Integrated Learning (CLIL), quantitative research,

Introduction

Photography has an important role in today society. The more sophisticated digital cameras have boosted population interest and taking of pictures. Within this context, some artists, like fotolateras.com, use tin cans to take black and white photos. They have travelled around the world "cooking" pictures using this technique. Some of their pictures were exhibited recently as the final step of a multidisciplinary learning project between two European universities.

The exhibition, entitled Tinned Cities, was organised thanks to the collaboration agreement between the University of Valencia and the London School of Economics. Students from both universities took part in an interdisciplinary project based on a real decision making process in the context of cultural management. This pedagogical resource is framed within the active learning environment literature, which is presented first in this paper. Then, we describe this interdisciplinary project analyzing both the contribution of students at the UV designing and implementing of a market research to organize the pinhole photography exhibition, and students at LSE writing descriptions of each picture to be exhibited.

In this project, students have worked linguistic aspects, economic and managerial contents as well as other social competences. In particular, the activity was held for LSE students taking an optional course such as Spanish Language and Society, which is oriented to non-Spanish-speaking students, and for students at UV taking a core course of the Business Administration degree (i.e. Marketing Research) in English, which is not the native language for most students. Students had to do several tasks in groups related to Business and Society (qualitative and

quantitative research, including a survey, data collection and statistical analysis, and written reports). Language used by LSE students was Spanish, while UV students had to communicate in English.

Next, the 23 photographs selected by a sample of around 600 individuals, most of them representing icon cities (New York, Venice, Paris, etc.), were exhibited together with their explanations at the LSE Arts Centre in February 2010. In order to test students' participation, motivation and satisfaction with this innovative project, we undertook a quantitative research using a structured questionnaire. Results showed high levels of participation, motivation and satisfaction. Artistic black and white pinhole pictures have been successfully used as a pedagogical resource.

Active learning environment

Active learning environments, in comparison to traditional classrooms, have been associated with increased student motivation (Garcia & Pontrich, 1996, Stipek et al., 1998), contributing in this way to self-regulated learning (Young, 2005). In this sense, the cognitive theory states that student motivation and performance is influenced by the will to reach specific academic objectives, that can be learning-oriented or goal-oriented (Elliott & Dweck, 1988; Ames, 1992; Dupeyrat & Mariné, 2005). Additionally, student social motivations have been also proposed as antecedents of academic goal achievement (Wentzel, 1993; Urdan & Maehr, 1995; Covington, 2000; Humphrey, 2004). Thus, student motivation is closely related with participation (Martin, 2007).

To actively involve students in their learning process, Marketing lecturers have used various learning methods and activities such as team projects (Lilly & Tippins, 2002), documented class participation (Peterson, 2001), experiential learning exercises (Gremier et al., 2000), Internet-based projects (Siegel, 2000), case-study method (Kennedy et al., 2001) and, sharing certain characteristics with the latter, problem-based learning (Savery, 2006).

In particular, problem-based learning is an instructional approach focused on the student that develops the ability to carry out a research, to integrate theory and practice and to apply knowledge and skills to reach a viable solution to a problem (Savery, 2006). However, to ensure effective learning and transfer of skills, problem-based learning requires activities highly valued in the real world (Bransford et al., 2000). Mainly used in Medicine studies, this teaching-learning method has been applied successfully in the past decades and continues to gain acceptance in various disciplines. This method can be included among active and cooperative learning strategies, that use students to help each other learn (Slavin, 1990).

An important trend in education in the last decades is a movement of the focus from that of teaching to that of learning (e.g. Bates, 1995; Oliver & Omari, 1999). An evidence of this change is the wide use of problem-based learning, an instructional learner-centered approach that empowers learners to conduct research, integrate theory and practice, and apply knowledge and skills to develop a viable solution to a defined problem (Savery, 2006). The learning effectiveness and the transfer of skills of problem-based learning requires activities valued in the real world (Bransford, Brown & Cocking, 2000).

In the present paper, we present a problem-based activity in a Content and Language Integrated Learning (CLIL) program. It is a project based on a multicultural, interdisciplinary and bilingual collaboration developed between two European universities, i.e. the University of Valencia (Spain) and the London School of Economics and Political Science (United Kingdom) thanks to a previous bilateral interuniversity agreement in force since 2006.

The Marketing Department of University of Valencia (Spain) and the Spanish Section of the Language Centre in London School of Economics (UK), with the help of the photography artists fotolateras.com, decided to implement a set of teaching-learning activities related to the subjects marketing research (for University of Valencia students) and Spanish language (for the London School of Economics students). A pinhole exhibition was proposed as a source of inspiration for multidisciplinary activities in Higher Education studies at both universities. Results allowed to design a pinhole exhibition which was held at the Atrium Gallery of the LSE in February 2010.

In order to assess the outcomes of this activity, both qualitative and quantitative approaches have been considered. Regarding the qualitative assessment, results allow us to conclude that this collaboration project enable students to obtain and to process information on other realities and to improve their language skills through a motivating online learning environment. In general, students' involvement and feedback provided seem to confirm the positive contribution of this problem-based, interdisciplinary and bilingual activity to the teaching-learning process. Concerning quantitative analysis, a survey to measure the student assessment of this activity was performed among participants. In particular, the survey allowed to measure student assessment on the interest of this activity for the teaching-learning process, motivation, group interaction and use of technological tools. We also consider data about student participation in this activity and final grades. After statistically processing of student assessment, participation and grades, as well as the qualitative feedback obtained from student' comments, we obtain evidence supporting the relevance of this project in the teaching-learning process and its positive implication in students' results. Notwithstanding, the project fails at encouraging group interaction and involves difficulties in the use of technology. A discussion about the importance of task definition and its influence on e-learning outcomes will be developed.

Interdisciplinary project

The project "*Pinhole exhibition: Tinned Cities/Ciudades Enlatadas*" was conceived as an inspiration for several multidisciplinary activities. Specifically it was integrated in two courses in the academic year 2009-10:

- Marketing Research, core degree of the Business Administration degree, taught in English by Manuel Cuadrado-Garcia and María-Eugenia Ruiz-Molina, marketing lecturers at the University of Valencia. In 2009-2010 students taking this course have developed a survey that has shown the real-life implementation of marketing research. Specifically, they have undertaken a quantitative research to select 23-black and white pinhole pictures by *fotolateras.com* to be shown in an exhibition at LSE in February 2010. Thus, students have fully understood the application of Marketing Research theoretical concepts.
- Spanish Language and Society (Beginners) course coordinated by Lourdes Hernández-Martín, Assistant Language Co-ordinator (Spanish) at LSE. In 2009-2010, as part of Spanish Language and Society (Beginners), students have followed a 20-hours activity called *Still Spanish*, a workshop which aims to provide students with a basic knowledge of documentary films. As their final product, students have been asked to create a multimedia essay using pictures, text and audio under the title *Cityscape*. In this frame, the 23-pictures of *Tinned Cities/Ciudades Enlatadas* by *fotolateras.com* to be shown at the exhibition have been used as material for several activities for *Still Spanish*. Among those activities, students have written the captions of the pictures for the exhibition (with a translation in English). Finally, students followed a workshop given by *fotolateras.com* on photographic techniques. All these activities have taken place in Spanish and they have been integrated into the curriculum of the course during Lent Term.

The aims of the projects were the following:

For the Marketing Department, Faculty of Economics, UV, the aims of this project are linked to the basic principles, competences and skills of the University of Valencia strategic plan and the Bologna principles. Among them: cooperation, exchange, languages, cultures, new technologies, critical thinking, etc. Focused on the UV students, the project aims

- To understand the role of marketing research in an organisation and in the society, and specifically in the arts context.

- To develop individual and team working abilities, to improve informational and communicational skills, and to learn to search and analyse different types of information resources.
- To understand the problems or situations an organisation may face, and suggesting surveys and actions to start solving them.
- To make the teaching-learning process more interesting, motivating and satisfactory.
- To make students more aware of disciplines different to business, management and marketing.

For the Spanish Section, Language Centre, LSE, this project have offered the Spanish section a mean to directly address some of LSE values and strategic priorities as stated in the *LSE Strategic Plan 2008-2013*:

- To implement innovative ways of teaching and learning offering students educational experiences which are engaging and relevant.
- To address the whole student experience which encompasses their social, living, study and life experiences.
- To engage with the wider community through a diverse range of activities.

In order to achieve the above objectives, a real problem in cultural management was proposed to students to be solved. The following steps were followed:

21 September 2009- 15 December 2009

In the course Marketing Research in the International Group (taught in English) at the University of Valencia, students have carried out a market research in order to select, among a large number of pinhole photographs by *fotolateras.com*, the most-liked 23 photographs to be shown in a public exhibition at LSE.

Qualitative and quantitative techniques have been developed to measure the level of attractiveness of the pictures. The research population, i.e. interviewees, has been potential visitors of an art exhibition in a university campus: students, administrative personnel and academics in the University of Valencia.

In particular, the University of Valencia students have developed six activities to conduct a real research from the research problem definition to survey data analysis and decision making. In order to provide a solution to the problem of choosing 23 photos out of 53, UV students had to conduct several activities:

- management problem and research problem definition,
- research questions definition,
- qualitative research using secondary sources of information (i.e. documents already available, not elaborated by the researchers, such as institutional websites and market research databases of the UV library, that involve generalization, analysis, synthesis or data evaluation).
- quantitative research through primary sources of information (i.e. first-hand information collected by researchers), that involved questionnaire elaboration and survey to collect data from 10 respondents by student,
- data analysis through statistical analysis software (SPSS version 17).

UV students had to deliver three written reports showing and explaining the results of their qualitative research (Report 1), data collection (Report 2) and data analysis (Report 3).

Report 1 consisted in a comparative study between United Kingdom (i.e. exhibition site) and Spain (country where the research is developed) about attendance to exhibitions, camera sales and additional data allowing inferences about the popularity of photography and cultural events related to this in United Kingdom and Spain. In order to complete this task, UV students made use of the databases available in the Virtual Library of the University of Valencia.

Report 2 involved for students to develop proposals of questionnaire that were later gathered by the lecturers to elaborate an official questionnaire that will be used by all the students in the field work. The objective of this questionnaire is to gather the assessment of a representative sample of members of the university community (i.e. target market of the exhibition) about the 53 pinhole photos with the final purpose of selecting 23 for the London exhibition. In order to achieve this aim, each student must collect 10 valid questionnaires.

Finally, Report 3 shows the results of the questionnaire once processed with the SPSS software. The students are invited to perform a series of statistical analyses that allow to choose the 23 most preferred pictures by respondents and to conclude the potential success of the pinhole exhibition to be celebrated in London.

For students at the University of Valencia, this project was proposed as a team and voluntary activity, whose full implementation might contribute to the student's final grade in a maximum of 1 point out of 10.

15 December 2009-10 January 2010

Fotolateras.com organised the exhibition to be taken place in London according to the results of the research. In this sense, *Fotolateras.com* sent copies of the 23 selected photographs via email to Lourdes Hernandez-Martin to be integrated in the activities of *Still Spanish*.

January 2010

Once the 23 photos were selected as a result of the research conducted by the students at the University of Valencia, the students of Spanish Language and Culture at the London School of Economics are invited to develop a caption and a text (in Spanish with a translation in English) to accompany each of the photographs in the exhibition in London, under of the collaboration agreement between both universities. That is why it is an inter-university project designed as a multicultural, interdisciplinary and bilingual. Each student at LSE has to develop this task individually.

Pinhole photography exhibition

The last step of the project was the exhibition in itself. The most important dates are the following

- Exhibition at LSE: Tinned Cities/Ciudades Enlatadas. Inauguration: 16 February 2010, Time: 19.30, Place: Atrium Gallery, Old Building.
- Workshop. The artists will give a 4-hours workshop to students of Spanish Language and Society (Beginners) in Spanish on photographic techniques focusing on pinhole techniques using tins.
Day: 17 February 2010, Time: 14.00-16.00
Weather permitted, students will have the opportunity “to *photo-tin*”: 18 February 2010, Time: 9.00-11.00.

A sample of 600 individuals assessed the 53 pictures selected by fotolateras.com among all those taken previously by the artists. Each picture was assessed by respondents using a 4-item semantic differential scale. Most of the pictures selected represented icon cities such as New York, Venice and Paris. Besides, water was a common feature found in most of the pictures selected. Table 1 shows the mean for each picture. Pictures 50 (Gran Canal, Venice), 7 (Fountain, Castellón), 48 (Gondoli, Venice), 4 (Ría, Bilbao) and 9 (Kursaal, San Sebastián) were the ones most preferred by individuals as they scored higher than five, out of 7.

Table 1: Pictures assessment

Estadísticos descriptivos

	N	Mínimo	Máximo	Media	Desv. típ.
Picture50	46	3,25	6,75	5,4185	,81489
Picture7	50	3,25	7,00	5,2300	1,20568
Picture48	39	1,75	7,00	5,1603	1,15776
Picture4	49	2,50	7,00	5,1173	1,05339
Picture9	40	3,25	7,00	5,0438	,96391
Picture37	40	2,25	7,00	4,9750	1,38652
Picture8	50	3,00	6,75	4,9650	,89928
Picture51	36	1,50	6,50	4,8889	1,30034
Picture3	49	1,75	7,00	4,7653	1,26903
Picture10	39	3,00	6,50	4,7372	,90129
Picture22	50	2,75	6,50	4,7250	,83184
Picture19	60	2,00	6,25	4,7083	1,07077
Picture29	39	2,00	7,00	4,6410	1,26412
Picture30	40	1,75	6,75	4,5563	1,17327
Picture47	50	2,25	7,00	4,5500	1,05221
Picture53	56	2,00	7,00	4,5491	1,19413
Picture36	40	2,50	6,25	4,5188	,90827
Picture52	46	2,25	6,50	4,5000	1,10805
Picture46	60	2,00	6,50	4,5000	1,18875
Picture21	50	1,50	6,00	4,4350	1,11896
Picture28	39	2,50	5,75	4,4103	,75543
Picture41	50	2,00	7,00	4,3850	1,58211
Picture23	50	2,25	6,50	4,3750	,91647
Picture39	50	2,00	6,50	4,3450	1,09718
Picture49	36	1,75	6,25	4,3333	1,35752
Picture38	50	2,00	6,50	4,2600	,98193
Picture13	50	2,25	7,00	4,2050	1,16681
Picture16	50	1,75	6,50	4,1400	1,19005
Picture18	50	2,00	6,25	4,0850	1,00078
Picture24	40	1,50	6,25	4,0813	1,14828
Picture26	39	1,00	6,50	4,0769	1,20328
Picture34	40	1,25	5,75	4,0500	1,21581
Picture27	39	1,50	6,25	4,0256	1,33377
Picture31	40	1,75	5,75	4,0063	1,08233
Picture40	50	1,50	6,75	4,0000	1,34392
Picture25	39	1,25	5,75	3,9359	1,36897
Picture32	40	1,25	6,50	3,9313	1,04695
Picture45	49	2,25	6,25	3,9235	1,10774
Picture17	50	1,25	7,00	3,8900	1,34312
Picture20	60	1,50	6,50	3,8625	1,04904
Picture15	50	1,25	7,00	3,8350	1,31476
Picture33	30	1,25	5,75	3,8250	1,26141
Picture12	40	2,50	6,50	3,8063	,98626
Picture35	40	1,25	6,75	3,7750	1,45752
Picture11	40	1,50	5,25	3,7500	,96907
Picture1	69	1,25	6,25	3,6594	1,20200
Picture14	50	1,00	5,50	3,6250	,99264
Picture6	50	1,00	5,75	3,6100	1,39894
Picture43	50	2,00	5,25	3,4300	1,03144
Picture5	49	1,00	7,00	3,3980	1,37965
Picture44	50	1,50	5,50	3,3950	,93826
Picture2	59	1,00	6,25	3,0508	1,18520
Picture42	50	1,25	5,00	3,0500	,92168
N válido (según lista)	0				

Participation, motivation and satisfaction

With these activities we expected to increase student motivation, comprehension of the contents of the respective subjects and the involvement of class activities. In order to assess these expected outcomes, we have combined both qualitative and quantitative data. Regarding the former, we have considered the quality of the tasks developed by the students during the course, as well as the feedback received.

Regarding quantitative inputs, we have conducted a survey among students to assess motivation, group interaction, use of technology and the suitability of problem-based learning. The items of the questionnaire have been adapted from Hazari et al. (2009) and proposed by the authors. Data have been processed through SPSS statistical software to obtain descriptive statistics and contingency tables.

To evaluate the results of this pilot activity for the UV students, first, it is considered the student participation in this activity, both quantitatively and qualitatively. In this sense, although this activity was voluntary and its contribution to the student final grade was scarce (i.e. 10% maximum), almost all enrolled students took part in this project. In particular, 57 out of 64 students (i.e. 89.06%) submitted at least one of the three reports under this activity. Regarding the quality of the reports submitted, it is quite high, being the average grade “outstanding”.

Secondly, the last day of class a questionnaire based on the proposal of Hazari et al. (2009) was administered in order to gather students’ evaluation of their perception of the educational contribution of this activity, their motivation for problem-based learning activities, the ability of this activity to encourage interaction within the group and the use of technology tools such as databases of the Digital Library of the University of Valencia and the statistical software SPSS. Additionally, classification questions were included.

Respondents were asked to rank each statement in a 5-point Likert scale according to their level of agreement or disagreement (1 = I totally disagree, 2 = I disagree, 3 = neutral, 4 = I agree, 5 = I totally agree). Results for 56 valid questionnaires are shown in Table 2.

Table 2. Students’ assessment of the pinhole activity contribution to the teaching-learning process

	Mean	St. Dev.
1. The Pinhole Exhibition activities were overall easy to understand	3.95	0.796
2. I liked interacting with other students in the Pinhole Exhibition activity	3.73	0.842
3. I would prefer classes that use problem-based activities over other classes that do not use this kind of activities	3.36	1.227
4. Using SPSS was easy	3.02	0.981
5. The Pinhole Exhibition activities aided me in achieving course objectives	3.59	0.813
6. I stayed on the task more because of the Pinhole Exhibition activities	3.36	0.841
7. I would like to see problem-based activities used in other courses	3.79	0.825
8. Benefit of the Pinhole Exhibition activities is worth the extra effort & time required to work on them	3.45	0.807
9. I participated in the assignment more because of this problem-based activity	3.47	0.690
10. Benefits of using the SPSS outweighed any technical challenges of its use	3.27	0.952
11. The Pinhole Exhibition activities helped me interact more with students	3.64	0.841
12. Technical features of SPSS helped enhance my learning	3.36	1.103
13. Because of working on a real problem-based activity, my group was able to come to a consensus faster	3.59	0.910
14. I will retain more material as a result of taking part in the Pinhole Exhibition activity	3.47	0.790
15. I would recommend classes that use real problem-based activities to other students	4.16	0.811
16. Compared to SPSS, the Euromonitor database was easier to use	3.87	1.090
17. Development of a real marketing research promoted collaborative learning	3.96	0.687
18. I learned more because of information shared with other students in the Pinhole Exhibition activities	3.36	0.749
19. The Pinhole Exhibition activity enhanced my interest in the course	3.66	0.837
20. I will continue to explore use of databases for education	3.63	0.964

Regarding the assessment of the pinhole activity by the UV students, the results obtained are encouraging, since the scores exceed the midpoint of the 5-point Likert scale (i.e., 3) for all

items considered. In particular, high scores are obtained for the items "I would recommend classes that use real problem-based activities to other students" (4.16), "Development of a real marketing research promoted collaborative learning" (3.96) and "The Pinhole Exhibition activities were overall easy to understand" (3.95). Notwithstanding, the questionnaire also shows as the worst rated items those relating to the use of technology tools: e.g. "Benefits of using the SPSS outweighed any technical challenges of its use" (3.27) and "Using SPSS was easy" (3.02).

Grouping the items in Table 2 in the four factors identified by Hazari et al. (2009), i.e. Learning/Pedagogy, Motivation, Group Interaction and Technology, we have estimated the average of the items included in each factors. Results are shown in Table 3.

Table 3. Students' assessment of the pinhole activity contribution to their English command

Factor	Items no.	Mean	St. dev.
Technology	1, 4, 10, 12, 16	3.48	0.557
Motivation	3, 6, 8, 15, 20	3.71	0.491
Group Interaction	2, 11, 13, 17, 18	3.13	0.435
Learning/Pedagogy	5, 7, 9, 14, 19	3.60	0.493

The results obtained provide evidence in the sense that our problem-based activity is not encouraging group interaction as expected. Thus, although Reports 1 and 3 were to be developed in teams, it seems as if team members divided tasks and worked individually. This finding has relevant implications for task definition.

Furthermore, the resulting average for the Technology factor supports the difficulties experienced by some students with the technological tools used during the course. Notwithstanding, the high value of the standard deviation for this factor reflects the heterogeneity of the assessments expressed by students regarding this issue.

On the other hand, the high average scores for student motivation and the contribution of this activity to learning are encouraging. Therefore, the fact of conducting a real research from the beginning to the end seems to have encouraged students to follow actively the course and to complete the different tasks, contributing positively to the assessment of their learning in this subject.

Additionally, UV students are requested about the contribution of this activity to improve their English command. Results for this issue in comparison to the previous English command declared by the student are shown in Table 4.

Table 4. Students' assessment of the pinhole activity contribution to their English command

English command	Pinhole activity contribution to English command			Total
	None	Fair	Significant	
Intermediate	2 3.6%	10 17.9%	1 1.8%	13 23.2%
Advanced	19 33.9%	10 17.9%	2 3.6%	31 55.4%
Proficiency	5 8.9%	5 8.9%	0 0.0%	10 17.9%
Native	2 3.6%	0 0.0%	0 0.0%	2 3.6%
Total	28 50.0%	25 44.6%	3 5.4%	56 100.0%

Chi-squared: 10.807 (p-value: 0.095)

As a result, we observe that half of the students consider that taking part in this activity has positively contributed to the development of their communication skills in English. In particular, this improvement is assessed as more relevant the lower the English command of the student. Therefore, we obtain evidence supporting a positive impact of the proposed problem-based activity on the teaching-learning of Marketing Research and on the student language skills.

Finally, the questionnaire included an open question -“Any additional comments? (such as what you liked MOST/LEAST about the Pinhole exhibition marketing research)”- inviting students to provide qualitative feedback about their experience in this problem-based activity. Results are shown in Table 5.

Table 5. Students additional comments

Type of feedback	Number of students	%
Positive	7	12.5%
Positive & negative	1	1.8%
Negative	4	7.1%
None	45	78.6%

Although this was the last question and was not so quick to answer as the preceding multiple choice or 5-point-scale questions, nearly a quarter of students developed their impressions about this activity. In particular, 12.5% of students responded to this question with thankful and supporting comments, encouraging the lecturers to repeat this type of activity in further courses. On the other hand, all negative comments were focused on complaints about the difficulties experienced with the use of SPSS software and the speed of computer processing. Regarding the latter, there were some problems with computers in some sessions due to a failure in the UV network. Notwithstanding, some students suggested the convenience of including an additional session to get familiar with the SPSS software before developing the required task and, thus, we shall take this idea into account for further courses.

CONCLUSIONS

A problem-based learning approach was adopted to design a Marketing Research course activity to be developed sequentially, enable students to achieve course objectives in a more efficient way in comparison with traditional methods. Following the evidence obtained for the UV Marketing Research course, we consider that the interdisciplinary collaboration between UV and LSE through this project has involved positive effects on students' motivation, involvement and performance. In particular, we have obtained results supporting that, even if there is a low extrinsic reward for the student because of his/her participation, he/she becomes actively implicated in the activities proposed if he/she considers them as exciting challenging and useful for solving a real-world problem. This result has implications on the design of attractive teaching-learning activities that may stimulate student's participation therefore contributing to improve his/her final results. This evidence is in the line of Deci & Ryan (1985), who assumed that the activation of intrinsic motivation is determined to a great extent by characteristics of the task. In this sense, we agree with Bergin (1992) regarding the existence of a relationship between motivation, academic activities and leisure that the lecturer must take advantage of in favour of the teaching-learning process.

All in all, the results obtained for the students of University of Valencia seem to support the positive influence of this interdisciplinary activity in the students' performance and the use of learning methods that facilitate active and cooperative learning through problem-based activities. The collaboration project allowed students from two different disciplines and different universities not only to meet the learning objectives of their corresponding courses, but also to get information on other realities (i.e. arts management) and to improve their foreign language skills. Both the qualitative and quantitative results seem to confirm the positive contribution of this interdisciplinary problem-based learning activity to the teaching-learning process and, according to previous literature, the convenience of the use of this method in Higher Education classrooms.

However, the evidence is not conclusive, as it has been an exploratory research and the activity should be replicated in further years and for different courses. Regarding the quantitative data, the results obtained could be biased because of some students' work in groups for Reports 1 and 3 that may find an incentive to act as “free riders”, since the grade for these reports was

common for all team members. On the other hand, causality between participation indicators and student's final grade has not been explored. In this sense, do students have better results because of their participation in this problem-based learning activity? Or do the "best" students tend to participate in this activity more than others? "Best" students might be more intrinsically motivated by these class activities and vice versa. In this sense, considering the performance of students in other subjects and qualitative analysis – e.g. interviews with students – might contribute to shed additional light on the results of this research.

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