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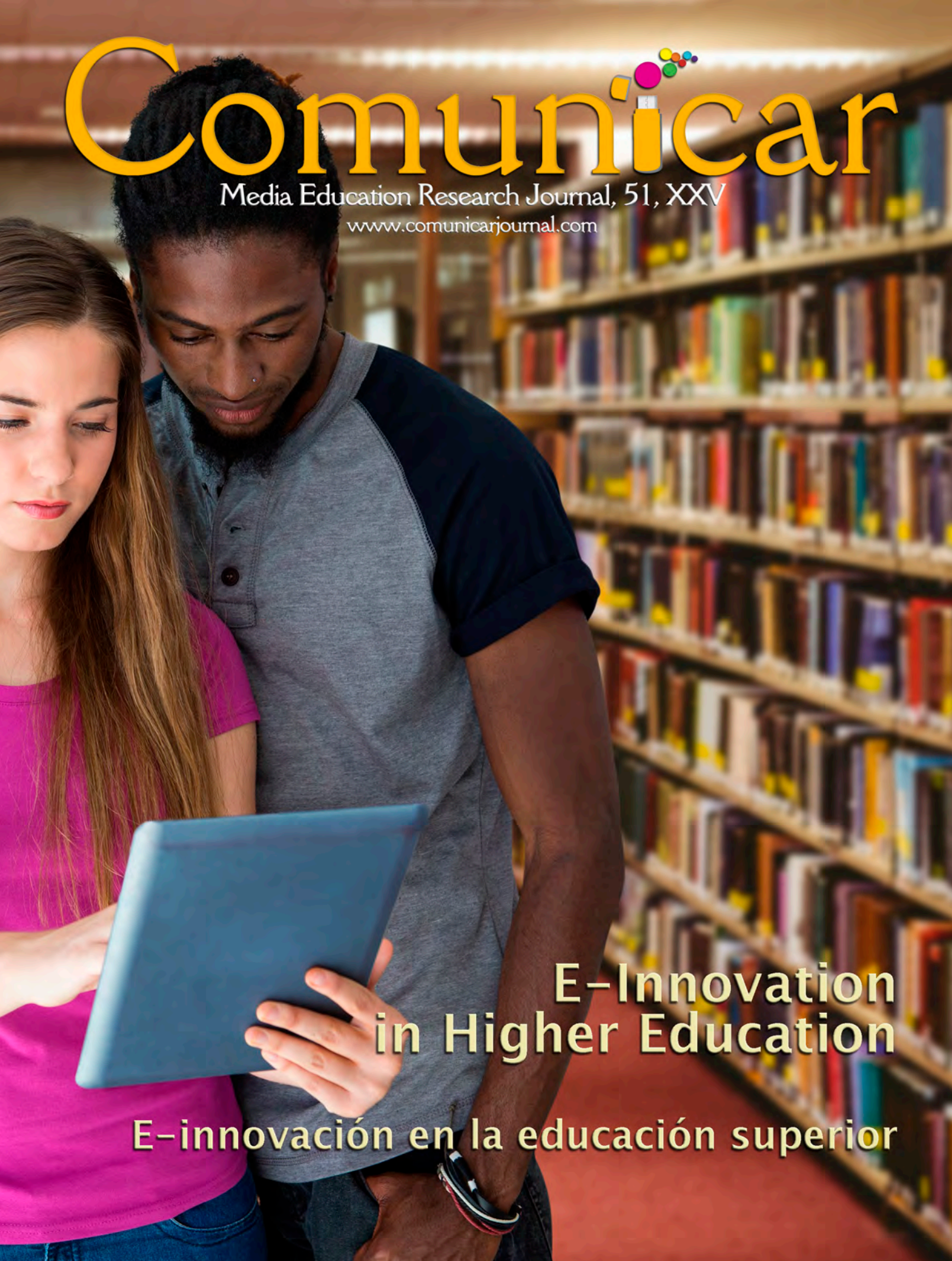

E-Innovation in Higher Education

E-innovación en la educación superior

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MEDIA EDUCATION RESEARCH JOURNAL
REVISTA CIENTÍFICA DE COMUNICACIÓN Y EDUCACIÓN

ISSN: 1134-3478 / DL: H-189-93 / e-ISSN: 1988-3293
n. 51, vol. XXV (2017-2), 2nd Quarter; April, 1st 2017

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PUBLISHED BY: GRUPO COMUNICAR EDICIONES
- **www.comunicarjournal.com**
- **www.grupocomunicar.com**
- Administration: info@grupocomunicar.com
- Staff: director@grupocomunicar.com
- Mail box 527. 21080 Huelva (Spain)

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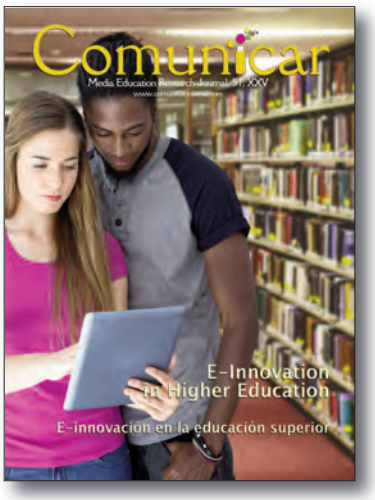

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© ISSN: 1134-3478 • e-ISSN: 1988-3293

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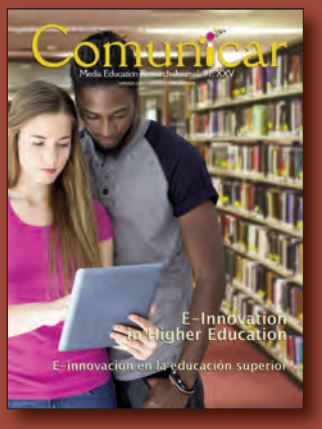

Comunicar 51

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E-Innovation in Higher Education

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Comunicar
Revista Científica de Comunicación y Educación
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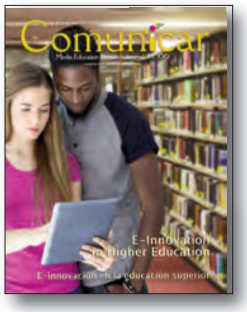

Formative Research in Ubiquitous and Virtual Environments in Higher Education

La investigación formativa en ambientes ubicuos y virtuales en Educación Superior

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ABSTRACT

Academic training in research is fundamental in the quality of higher education and within this context, technological mediation becomes pivotal to reach student-centered learning objectives in any moment and at any time. The findings of a study, the purpose of which has been to evaluate the results of the formative research of two groups of students that have interacted in learning environments (E-learning and U-learning), are presented. The research follows a quasi-experimental study with a design of chronological series and multiple treatment, framed in three stages that were defined as referencing, systematization, and analysis. The sample consisted of 189 fourth-year students of the Early Childhood Education degree, at El Bosque University in Bogotá, Colombia. The results reveal that U-learning environments strengthen and consolidate formative research as an ongoing process for undertaking educational research through personalization, adaptation, and situational learning, marking meaningful differences with respect to E-learning environments during the systematization stage. The intervention with U-learning environments has revealed challenges and needs in the academic curriculum such as strengthening the link between evaluation and educational research in the field of professional practice, as well as the incorporation of technology with the purpose of making it something natural, adaptable, and interoperable, that students are able to use it without even thinking about it.

RESUMEN

La formación en investigación es fundamental en la calidad de la Educación Superior, y en este contexto, la mediación tecnológica resulta esencial para alcanzar objetivos de aprendizaje centrados en el estudiante en cualquier momento y lugar. Se presentan los hallazgos de un estudio cuyo propósito ha sido evaluar los resultados de la investigación formativa de dos grupos de alumnos que han interactuado en ambientes de aprendizaje E-learning y U-learning. La investigación obedece a un estudio cuasi-experimental con un diseño de series cronológicas y tratamiento múltiple, enmarcada en tres etapas definidas como referenciación, sistematización y análisis. La muestra ha estado constituida por 189 estudiantes de cuarto año de Licenciatura en Educación Infantil de la Universidad El Bosque en Bogotá (Colombia). Los resultados revelan que los ambientes U-learning fortalecen la evaluación y consolidan la investigación formativa como un proceso permanente para aprender investigación educativa por medio de la personalización, adaptación y el aprendizaje situacional, marcando diferencias significativas con respecto a los ambientes E-learning durante la etapa de sistematización. La intervención con ambientes U-learning ha traído consigo retos y oportunidades de innovación en el currículo académico, tales como el fortalecimiento del vínculo entre la evaluación y la investigación educativa en los campos de práctica profesional, así como la inclusión de la tecnología hasta convertirla en algo natural, adaptable e interoperable, de modo que los alumnos pueden utilizarla sin tan siquiera pensar en ella.

KEYWORDS | PALABRAS CLAVE

Educational research, formative research, higher education, ubiquitous learning, U-learning, virtual learning, systematization of experiences, teaching practice.

Aprendizaje ubicuo, aprendizaje virtual, educación superior, investigación educativa, investigación formativa, práctica docente, sistematización de experiencias, U-learning.

Received: 2016-04-11 | Reviewed: 2016-09-09 | Accepted: 2016-12-05 | Preprint: 2017-02-15 | Published: 2017-04-01
DOI: https://doi.org/10.3916/C51-2017-01 | Pages: 09-18

1. Introduction

Quality in education is a key issue that has been included in the agendas of the Ibero-American governments in the last decade. The Colombian Ministry of Education (MEN, 2015-2016) points out that quality education is a generator of opportunities that change realities. In this context, quality in higher education is related to the capacity of university institutions to make it possible for students to achieve academic results directly related with their learning process and their area of study, through technology, professional practice, and research (Ardila, 2011).

Higher education should be essentially an ongoing process of research mediated by the development of science and technology, since these elements are fundamental for consolidating high quality education (Restrepo, 2003). This process requires an ongoing dialogue between the appropriation of knowledge, its transformation, and its linkage to the professional practice in order to ensure that students adapt to the conditions and requirements of the context, understanding that the quality of education is associated with the research practices and, at the same time, these are linked to the search for, construction, and appropriation of knowledge (Herrera, 2013).

It is in this context that formative research, which is conceived as the research process that is developed so that the student is educated from problematic situations close to the curricular context and their professional future, becomes meaningful (Restrepo, 2003). The academic scenario of our work and that of the participants fourth-year students on the Early Childhood Education degree at El Bosque University, in Bogotá, Colombia-, necessarily leads us to contemplate formative research for academic training in Educational research from the perspective of the experiences and paradigmatic and methodological approaches that logic and their particular activities impose in the field of education.

Strengthening the link between educational research and professional practice is one of the fundamental objectives of the Higher Education Institutions and, therefore, it is an element of essential importance for the generation of new knowledge. From this perspective, the student is expected to follow the path of educational research through continuous and systematic praxis, and in so doing, to fulfill student-centered learning objectives. Academic training for research should take advantage of all those activities that are oriented towards the «learning to learn» process with the purpose of strengthening and consolidating skills and knowledge in students that enable them to successfully develop activities related to academic research, development, and innovation.

In Colombia, for 65.000 students which represents 5% of the entire child population according to the National Accreditation Council (CNA, 2015), virtual assistance has been essential in their formative process. In the context of the study presented in this article, technological tools have been used to assist and evaluate the formative processes in educational research, particularly through applications which capture and edit digital data, software for the analysis and systematization of information, electronic resources for bibliometric studies, and platforms for evaluation and research evaluation. Recent technological developments have also allowed access to databases and referencing managers for formative processes in research, which has facilitated the use of specialized sources of information (Velandia, 2014). Similarly, technological progress has strengthened research in the way that it has initiated collaborative work and communication between peer researchers in accessing research practices, socializations and disclosures (Herrera, 2013). Another fundamental factor that is associated with technological development in formative research processes has been the orientation and flexibilization of tutoring in synchronous and asynchronous manners, which in terms of quality of education is considered to play a pivotal role in the development of research competence through the formative assessment of the student. (Martínez, Pérez, & Martínez, 2016).

Nevertheless, for the participants in this study, who are being trained as future teachers in Early Childhood Education, there are conditions and elements where virtual environments do not facilitate a permanent dialogue between educational research and the reality of the student in his/her professional practice. Only 54.3% of the students carry out their professional practice in urban and rural areas (Velandia, 2014), where internet connection becomes a factor that makes the systematization of the pedagogical experience and the tracking process of formative research difficult. Although digital resources have allowed the extension of guidance processes in other scenarios beyond the classroom, certain requirements such as access to electronic devices and the quality of the internet connection are still to be met, under the assumption of effective functioning of the tools at any time and location. Strengthening the link between technology and formative research in the field of professional teaching practice implies restructuring the educational experience to consider acknowledged standards for the academic community and, at the same time, it must respect the rigor of the systematization. This task requires an intellectual labour, the manifestation of skills, and the implementation of those resources that assist the process. Educational research must systematize the experience in which analysis is key to build knowledge and to developing professional competences.

With this statement in mind and with the contextual need to build environments that allow the monitoring of the processes of formative research at any time and place, an ad hoc U-learning environment was designed and implemented. Although communication and information exchange through learning environments that are mediated by digital technologies have made relevant formative processes possible, the need to analyze ubiquitous learning environments has arisen as a possibility for strengthening scenarios of pedagogical practices for the educational research training in higher education and to determine if there are differences regarding the use of virtual environments.

The articulation of educational research with professional practice requires the systematization of the pedagogical experience, which is understood as an ongoing exercise in the production of critical knowledge from practice (Jara, 2012). This process implies considering and interpreting what takes place and reconstructing what has happened by engaging in the identification of elements that have intervened in the experience from a critical perspective in order to understand it from the basis of the practice itself. The articulation of educational research with professional practice has 3 stages that are sequenced and called referencing, systematization, and analysis. The initial or referencing stage involves the construction of antecedents, theoretical referents, and epistemological frameworks that are determined by the emergent issues in the pedagogical practice scenarios; the intermediate or systematization stage (Torres, 1999) embraces data collection and processing of the context, and the final or analysis stage corresponds to the triangulation, interpretation, and discussion of findings (Correa-García, 2003). This process requires technological assistance that allows access and ongoing information tracking, in addition to a formative evaluation that provides students with feedback. In the same way, the process cannot be limited to a physical and temporal space, given the fact that knowledge is built in a conscious and unconscious way at any time and place.

> Strengthening the link between technology and formative research in the field of professional teaching practice implies restructuring the educational experience to consider acknowledged standards for the academic community and, at the same time, it must respect the rigor of the systematization. This task requires an intellectual labour, the manifestation of skills, and the implementation of those resources that assist the process. Educational research must systematize the experience in which analysis is key to build knowledge and to developing professional competences.

2. State of art

The use of technological tools in educational process began around the 1950s with distance education, in which media were positioned as an alternative for democratising learning and which allowed the extension of academic participation to different scenarios in which printed texts, manuals, and books sent via mail sealed the beginning of an education generation blessed with technological resources (Aparici, 2002). Later, towards the 1970s the concept of 1.0 formation was born, it was considered as an analogical stage characterized by unidirectional mediation through radio and television: a static network for transmitting information and knowledge in a unidirectional way (Sevillano-García, Quicios-García, & González García, 2016). Towards the early 1990s, offline learning incorporated multimodality (Díaz, 2009). CD-ROM and computer science enabled the student to interact in two ways, teacher-digital medium-student (Capacho, 2011). The great advances in the field of science and technology at a virtual educational level (E-learning) have transformed economic, educational, political, social, and cultural sectors since the early 1990s; the so called digital era has produced great development and challenges that must be taken on board in the face of the dynamics imposed by the information and knowledge society (García, 2006). The incorporation of technology in face-to-face learning processes led to blended learning (Hinojo, Aznar,

& Cáceres, 2009). Similarly, the combination of electronic learning and smart mobile devices (Smartphone, iPod, Tablet, PDA) was seen, developments that allowed combining geographical mobility with virtual scenarios (Marcos, Támez, & Lozano, 2009).

2.1. Genesis and development of U-learning

Ubiquitous learning (U-learning) emerges as an inclusive learning paradigm, since it assimilates elements of each one of the modalities that were previously mentioned and, it also seeks to integrate technology in the assessment and monitoring of educational processes of the students in a natural way with a high dose of spontaneity, breaking the barriers that are framed by place and time. On the other hand, U-learning comes from the intelligent computing field, the artificial neuronal networks and the diffused logic whose main objective is that technological systems develop tasks of identifying patterns tasks in different sets of data in order to make decisions based on the optimization of processes. As an e-innovation agent, U-learning has been consolidated as an important concept in the last decade, since the technological development of mobile devices has allowed the operational focus to be the user, allowing student centered learning mediated by technology. In other words, at the beginning a computer was shared by several users, later, the use of personal computers was incorporated and, today we find that further development has led to the incorporation of ubiquitous technology, a third paradigm , which seeks to put different interconnected devices at the user's service. Through this technological approach, the devices are integrated into people's life; instead of intentionally interacting with only one device, technological ubiquity looks for simultaneous interaction with several devices for solving everyday tasks and, in many cases, without the person's awareness.

Strictly focusing on U-learning scenarios, there are different studies that have focused on the definition, construction, characterization, and application of ubiquitous learning environments as a situation of total immersion in the learning process. Jones & Jo (2004) develop a U-learning model based on intelligent computing and adaptive learning; the authors point out that digital devices are, day by day, naturally embedded in every aspect of our lives, making ubiquitous learning a certainty for the future of education. The research group (I+G) incorporates the concept of adaptive learning and, in this way, builds digital systems that adjust themselves to the needs of each student based on the personalized teaching method (Paramythis & Loidl-Reisinger, 2004).

Dey (2000) and Hornby (1950) agree on considering that students are able to assimilate knowledge when it is built as part of everyday context or real environments. Within this scenario, the student's profile and contextual information are used to collect, systematize, and evaluate data in order to respond to students' requirements at the moment they require them. In the study conducted by Chen, & Li (2010), the student's learning process is monitored by keeping track of his/her location, learning time, leisure time, time available to work on learning objectives and, time for group and individual work using artificial neuronal networks. Hwang & al. (2012) and Kim & al. (2011), both research teams at the «Anticipatory Computing Lab at Intel Labs» who developed an anticipatory communication model for the scientist Stephen Hawking, pointing out that systems can predict actions only with information from the context. The technological devices for forecasting the weather, transport routes and other events are commonly used today to improve quality of life. U-learning environments seek to predict the learning path of students and, in that way, anticipate guiding elements and activities that are synchronized with the suggested learning objectives. Through the interaction of students with electronic devices, it is intended to register their academic training and, in this way, to compare objectives and evaluation of learning, allowing the system to anticipate and adapt the answer so that students and teachers make decisions regarding the formative process.

Table 1. Comparison between E-learning, M-learning and U-learning

Comparison between E-learning, M-learning, and U-learning			
Learning environment	**E-learning**	**M-learning**	**U-learning**
Device	Computer	Mobile Device	Smart PDA
Connectivity	Broadband	GPRS, 3G, 4G, Bluetooth	WIFI, 3/4G, NFC, QSR
Content	Multimedia	Light	Interoperable
Learning Approach	Interactive	Spontaneous	Invisible
Information Flow	Hyperlinked	Connected	Associated
Communication	Collaborative	In network	Personalized
Mode	Virtual or Blended	Geo-positioned	Ubiquitous
Education	Formal	Informal	Non formal
Teaching method	Virtual	Shared	Personalized

At a general level, both E-learning and U-learning have differentiating characteristics regarding the type of interaction in the construction of learning and, in the use of communication technologies. The construction of the referents in this study has led us to synthetize the characteristics of E-learning, M-learning, and U-learning based on the proposal by Laouris & Eteokleous (2005) as shown in Table 1.

Based on the characteristics of the aforementioned technological environments and the contextual needs determined by the pedagogical practice, an ad hoc U-learning environment was designed and validated at El Bosque University with the purpose of analyzing its influence in the educational research that is required from fourth-year students in the Early Childhood Education degree. This process was conducted under the assumption that assessment and monitoring are key elements that facilitate the development of autonomous skills in these students (learning to learn) in the necessary research training that is required for the completion of the thesis work. In particular, in this study we ask: Does the designed ad hoc U-learning environment for the development of research competence significantly improve the learning process of the fourth-year students of the Early Childhood Education degree at El Bosque University, compared to those who have learnt through an E-learning environment?

3. Materials and method

This is a quasi-experimental study with a pretest-posttest approach and a chronological series design with multiple treatments and a non-equivalent control group (Campbell & Stanley, 1995). The purpose of this study is to analyze the influence of U-learning environments on the learning outcomes of the formative research or academic training in educational research across three established moments in the process of systematizing the pedagogical experiences (referencing, systematization, and analysis), that are carried out through virtual classrooms. The students in the control group had access to the aforementioned academic training process through the E-learning virtual classrooms, while the students in the experimental group interacted with a U-learning environment. Both environments were built with the same educational research learning environments. The design in this study is shown in Table 2.

In the framework of a quasi-experimental design, the initial equivalence of the two groups is not guaranteed; this is because there is not random assignment (Hernández, Fernández, & Baptista, 2010). This is our case due to the fact that both groups were arranged in the process of student enrollment according to the criteria of academic management of the participating university and therefore, before this study started. The sample of this study is a total of 189 students (all of them women) in the fourth-year of the degree in Early Childhood Education in the Education Faculty at El Bosque University in Bogotá, Colombia. Out of the 189 students, 96 were the experimental group (U-learning environment) and 93 were the control group (E-learning environment). All of them were in academic training to become teachers through pedagogical practice and, at the same time, they take the educational research formative program. This program seeks to develop students' competences in research in order to contribute to the building of new knowledge in different fields of the educational system and to elaborate the research document (thesis) that is a requirement for them to graduate. Moreover, in the aforementioned program research topics that are related to the professional pedagogical practice are defined. The characteristic features of U-learning environments seek to accompany the formative process in different learning scenarios. Students from an education degree were selected to participate as they were already carrying out their teaching practicum in an educational context and that allowed the two components to be articulated into the thesis process.

Table 2. Methodological Design of chronological series

	Dependent Variable						
Independent Variable	Pretest	Referencing		Systematization		Analysis	
RG $_{U\text{-learning}}$	O_1	X_1	O_3	X_3	O_5	X_5	O_7
RG $_{E\text{-learning}}$	O_2	X_2	O_4	X_4	O_6	X_6	O_8

The systematization of experiences carried out in the U-learning environments registers in a databank the interoperation between devices, location, time synchronization, characterization of learning paths, monitoring of learning goals, and notifications regarding each user's personalization, adjusting the goals to the student's needs. The systematization of experiences based on the suggested parameters in the educational research processes, enables the student to take advantage of the articulation of the referencing, systematization, and analysis stages, understanding that they are a sequence of interdependent operations. During these stages, contents were structured and tools for

data analysis were provided, thus establishing connections between the context and the educational research processes.

The evaluation of the research competence of students from both groups (control and experimental) was done through evaluation rubrics (Andrade, 2013), taking as reference the models of research in ubiquitous and mobile contexts in higher education (Sevillano & Vázquez, 2015). The instrument has 41 items, each with four levels of achievement that are distributed as follows: Ten value the learning outcomes linked to the referencing stage of the context, twenty to the strategies of systematization, and eleven to the analysis and reflection of the experience. The analyses conducted, Cronbach's Alpha model and the Guttmann's split-half reliability method, revealed that the instrument to collect data has a high internal consistency since it showed a value of $\alpha \geq 0.80$ (Table 3).

With the purpose of guaranteeing methodological rigor, contents, activities, and interoperable learning objectives were implemented, elements that intervened in both environments and were structured from the student-centered learning theory according to the proposal by Fink (2008). After the theoretical and epistemological foundation, and the strategic planning of the methodological design, the consent form was distributed to the participating students. Later, a piloting test was carried out in three sessions: academic training, personalization, and the configuration of both learning environments proposed in this study.

Table 3. Reliability Statistics

Reliability Statistics			
Cronbach's Alpha	Part 1	Value	,791
		N of elements	21[a]
	Part 2	Value	,830
		N of elements	20[b]
	Total N of elements		41
Correlation between forms			,810
Spearman-Brown Coefficient	Even length		,806
	Uneven length		,811
Split half Guttman Coefficient			,815

Note: Confidence Intervals ≥80%

As a consequence, the intervention in the learning environments to accompany the participating students in their context-situated research process took place, a process in which the first stage (referencing) was simultaneously evaluated and monitored. In the next stage the data was collected and the second phase (systematization) was implemented; later, the data analysis and the implementation of the third stage of the formative research process took place. Finally, we worked on the reflection on and publishing of the results. The field study allowed collection and storage of data in a real context. Each stage of the formative research required 12 sessions that corresponded to three academic semesters.

Prior to the confirmatory analysis of the data, the parametric assumptions of normality and the population distribution were compared through the Kolmogorov-Smirnov test and the Levene test for homogeneity variables. Regarding the inter-group analysis differences, and given the non-equivalence between them, the possibility was opened for the Student's T-test for independent samples with parametric data, or the Mann-Whitney U test for independent groups with non-parametric data. The comparison between the dependent variables was done through the average scores obtained by the students in the evaluation rubrics at the beginning of the program (pretest) and along the three points (referencing, systematization and analysis). The critical value assumed for the contrast hypothesis is $\alpha<0.05$. The analytical treatment of the data was carried out with the IBM SPSS 23 statistic software.

4. Analysis and results

Table 4 summarizes the results that were obtained in the pretest and in the three subsequent stages of the intervention in formative research processes in both environments: U-learning (experimental group) y E-learning (control group).

Table 4 shows the means for each moment of the study (dependent variables) and for both groups. Taking into account that the coefficient on the variation does not exceed 25% in any of the dependent variables, the mean is statistically considered as a good criterion to apply the contrast hypothesis with parametric tests (Wayne, 2003). Subsequently, the Kolmogorov-Smirnov normality test was applied and the results show probability values higher than 9.05, indicating that the data of the dependent variables are adjusted to a normal distribution. The homogeneity of variance (Leven test) and the normality in the distribution of the implied variables led us to make the choice of parametric techniques for the analysis of possible differences between the control and the experimental group. The average values obtained in the diagnostic test of the pretest were similar for both groups (x_p=38.83, σ=7;

x_p=40.55. σ=7.25), which was confirmed through the Student's T-test for the independent samples, since significant differences are not observed between the two groups prior to being exposed to both experimental situations (t=-1.66; p>.05).

Table 4. The parameters estimated in the stages of referencing, systematization, and analysis, are compared with the criterion of variation index, Typical error of the mean and N=number of participants (Maximum score=50)

Group statistics

Learning Environment		N	Mean	Standard deviation	Standard error mean
Pre-Test	E-learning	93	40,5562	7,25382	,75219
	U-learning	96	38,8380	7,00327	,71477
Stage 1 – Referencing	E-learning	93	42,1971	5,99855	,62202
	U-learning	96	41,8563	5,21804	,53256
Stage 2 – Systematization	E-learning	93	38,6260	8,56053	,88769
	U-learning	96	42,5328	6,33121	,64618
Stage 3 - Analysis	E-learning	93	43,9841	7,32660	,75973
	U-learning	96	44,2970	7,47595	,76301

Table 5 shows the results of contrasting the differences between means for independent samples in the three stages of the intervention (referencing, systematization, and analysis). In stage 1, there was an improvement in the mean scores of the E-learning group in comparison with the experimental group U-learning (x_{1e}e=42.19 versus x_{1u}=41.85) with a homogenization of less dispersion in the experimental group (σ_{1e}=5.99 vs σ_{1u}= 5.21), showing that there are no statistically significant differences in the referencing stage between the two groups that interact in E-learning and U-learning environments (t=–0.42; p>.05). Both groups of students improve referencing activities in the educational research process, regardless of the learning environment in which they had interacted.

In the intermediate stage of systematization, the results indicate that there are significant differences between the means of the two groups (x_{2e}-x_{2u}=–3.9). In this case, the students of the control group are the ones who obtained the lowest results in the intervention, increasing the dispersion with a coefficient of variation higher than 20%; on the contrary, the experimental group (U-learning) showed a stable dispersion (Figure 1). The inter-groups analysis through Student's T-test confirms that such differences are significant between the E-learning and U-learning groups of students in the processes of systematization of the pedagogical experiences with (t=–3.58 y p<.05), being the one with the best average scores. The results, therefore, reveal that the students who interact with a U-learning environment meaningfully improve their systematization processes in their educational research training in contrast to those who only interact in the virtual classrooms.

Finally, regarding the last stage of the intervention (analysis), the lowest mean difference is observed concerning the rest of the independent variables in the work (x_{3e}-x_{3u}=0.31). The comparison of means between the E-learning and U-learning groups through the Student's T test evidences that there are no significant differences between the

Table 5. Test –Student's T-test for two independent samples
F=Fisher-Snedecor Statistic, Sig.=Statistical

Independent Sample Tests

		Test Levene of equality of variances		Test T for equality of means						
									95% difference confidence interval	
		F	Sig.	t	gl	Sig. (bilateral)	Difference of means	Difference of standard error	Lower	Upper
Pre-Test	Equal variances are assumed	,128	,721	1,66	187	,099	1,71823	1,03705	-,32759	3,764
Stage 1 – Referencing	Equal variances are assumed	2,92	,089	,417	187	,677	,34077	,81705	-1,2711	1,952
Stage 2 – Systematizatio	Equal variances are assumed	9,39	,003	-3,57	187	,000*	-3,9067	1,09285	-6,0626	-1,750
Stage 3 - Analysis	Equal variances are assumed	,038	,846	-,291	187	,772	-,31290	1,07709	-2,4377	1,811

* Weighting factor<.05 highlighted in bold

two groups (t=0.29 y p>.05). Therefore, the students' achievements in the activities for the analysis of the formative research process in which they have participated, is independent of the learning environment in which they have interacted.

5. Discussion and conclusions

The intervention with U-learning environments in general shows positive results in the processes of formative research so that students learn the logic and the proper educational research activities in the pedagogical practice scenarios through the ongoing dialogue between the pervasive technology and the students' reality at any time and place. The experimental results explain that ubiquitous learning environments facilitate contextual learning given the fact that proper content is provided at the right time and place, this in line with the statement by Chen and Li (2010). The actions performed in the U-learning environment (personalization, contextual information, comparison between evaluation and learning objectives) show that students in research formative process make the knowledge their own in a more meaningful way if pedagogical experiences are systematized in real contexts; customization, adaptation, and situational learning are fundamental factors for the technological system to anticipate and adapt the formative needs of different academic actors.

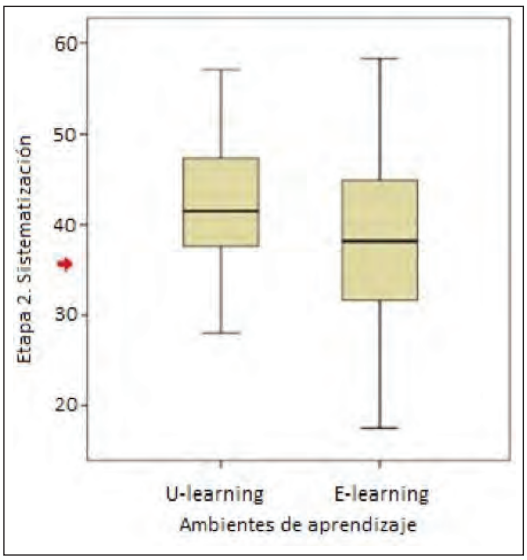


Figure 1. Box plot U-learning versus E-learning environments, systematization stage of pedagogical experiences.

There are no significant differences between the learning outcomes achieved by students who have interacted in both environments (U-learning versus E-learning) along the referencing and analysis stages of our own formative research proposal. Nevertheless, the use of U-learning environments to systematize experiences makes a significant positive difference in the research formative process of those students who have used E-learning environments. This conclusion leads us to support the belief that ubiquitous learning environments consolidate higher education as a permanent research process when integrated with science and technological development. While it is true that virtual education generates opportunities that change realities (MEN, 2015-2016), education that is supported with U-learning environments seems to extend this picture and to affect the quality of education through assessment, monitoring, adaptation, and situational learning.

Based on the evidence and on the level of acceptance by the different participants in the study, the need to suggest and develop intervention initiatives with U-learning environments in different educational contexts is shown. This might allow comparing our findings and assessing their level of generalization. The positive results of the intervention in U-learning environments in higher education are the beginning of new studies in search of the inclusion of technology in academic formative processes with the goal of making it something so incorporated, so adaptable, so natural, so interoperable that we can use it without even thinking about it.

Finally, it is important to note that the incorporation of ubiquitous learning environments requires a significant investment of human and physical resources, which is both a limitation and a challenge. Nevertheless, the impact of the academic training is reflected in the creation of personalized and contextually adapted systems, the building of learning paths and technology that monitors student-centered learning objectives through diagnostic, formative, and summative evaluation. The development and conclusions of this study have meant an ongoing challenge of innovation and the improvement of the curriculum and of the learning and teaching process of the afore mentioned course and group of students, which has meant the consolidation of a link between technology and educational research training in the field of professional practice. The formative research processes in ubiquitous contexts strengthen the evaluation due to the assessment and ongoing monitoring of professional practice. One of the fundamental conditions for the construction and intervention of U-learning environments in the formative process, is the incorporation of experienced teachers in the research groups with pedagogical, technological, and research skills, understanding possible deductions and opening space for future research regarding the use of smart learning environments, evaluation of the impact of virtual and distance educational policies, and the construction of learning paths in formative research.

Funding agency

El Bosque University (Bogotá, Colombia). Research Vice-presidency and Faculty of Education, Early Childhood Education Program in which Doctoral Program in Education of the International School of Doctoral studies from the Department of research and methods and diagnosis collaborate with the Early Childhood Program. Research Group: Education and Investigation UNBOSQUE.

Referencias

Andrade, H.G. (2013). Teaching with Rubrics: The Good, the Bad, and the Ugly. *College Teaching*, *53*(1), 27-30. http://dx.doi.org/10.1080/02602930902862859

Aparici, R. (2002). Mitos de la educación a distancia y de las nuevas tecnologías. [The Myths of distance Education and New Technologies]. *Revista Iberoamericana de Educación a Distancia*, *5*(1), 9-27. http://dx.doi.org/10.5944/ried.5.1.1128

Ardila, M. (2011). Calidad de la educación superior en Colombia, ¿problema de compromiso colectivo? *Educación y Desarrollo Social*, *6*(2), 44-55. (http://goo.gl/vfhKcR) (2016-06-01).

Campbell, D.T., & Stanley, J.C. (1995). *Diseños experimentales y cuasiexperimentales en la investigación social*. Buenos Aires: Amorrortu Editores.

Capacho, J.R. (2011). *Evaluación del aprendizaje en espacios virtuales-TIC*. Barranquilla (Colombia): Universidad del Norte-ECOE Ediciones.

Chen, C.M., & Li, Y.L. (2010). Personalised Context-Aware Ubiquitous Learning System for Supporting Effective English Vocabulary Learning. *Interactive Learning Environments*, *18*(4), 341-364. https://dx.doi.org/10.1080/10494820802602329

Consejo Nacional de Acreditación (2015). *Lineamientos para la acreditación de programas de Pregrado*. Bogotá: CNA.

Correa-García, R.I. (2003). Estrategias de investigación educativa en un mundo globalizado. [Educational Research Proposals in a Global Society]. *Comunicar*, *20*, 53-62. (https://goo.gl/AkMAa9) (2016-06-01).

Dey, A.K. (2000). *Providing Architectural Support for Building Context-Aware Applications*. PhD Thesis. USA: Georgia Institute of Technology.

Díaz, J. (2009). Multimedia y modalidades de lectura: una aproximación al estado de la cuestión. [Multimedia and Reading Ways: A State of the Art]. *Comunicar*, *33*, 213-219. https://doi.org/10.3916/c33-2009-03-013

Fink, D. (2008). Evaluating Teaching: A New Approach to an Old Problem. *Resources Network in Higher Education for Faculty*, 26, 3-21. San Francisco: Jossey Bass.

García, F.A. (2006). Una visión actual de las comunidades de «e-learning». [A Current View of The e-learning Communities]. *Comunicar*, *27*, 143-148. (http://goo.gl/VAaAiu) (2016-07-05).

Hernández, R., Fernández-Collado, C., & Baptista, P. (2010). *Metodología de la investigación*. México: McGraw-Hill.

Herrera, J.D. (2013). *Pensar la educación, hacer investigación*. Bogotá: Universidad de la Salle.

Hinojo, F.J., Aznar, I., & Cáceres, M.P. (2009). Percepciones del alumnado sobre el blended learning en la universidad [Student's Perceptions of Blended Learning at University]. *Comunicar*, *33*(XVII), 165-174. https://dx.doi.org/10.3916/c33-2009-03-008

Hornby, A.S. (1950). The Situational Approach in Language Teaching. *English Language Teaching*, *4*, 98-104. https://doi.org/10.1093/elt/IV.4.98

Hwang, I., Jang, H., Park, T., Choi, A., Lee, Y., Hwang, C., & Song, J. (2012). Leveraging Children's Behavioral Distribution and Singularities in New Interactive Environments: Study in Kindergarten Field Trips. *10th International Conference on Pervasive Computing*, 39-56. Newcastle, UK. https://doi.org/10.1007/978-3-642-31205-2_3

Jara, O. (2012). Sistematización de experiencias, investigación y evaluación: Aproximaciones desde tres ángulos. *The International Journal for Global and Development Education Research*, 1, 56-70. (http://goo.gl/6bpdm2) (2016-03-02).

Jones, V., & Jo, J.H. (2004). Ubiquitous Learning Environment: An Adaptive Teaching System Using ubiquitous technology. In R. Atkinson, C. McBeath, D. Jonas-Dwyer, & R. Phillips (Eds.), *Beyond the comfort Zone: Proceedings of the 21st ASCILITE Conferen*ce (pp. 468-474). Perth, 5-8 December (https://goo.gl/HUHWtN) (2016-05-07).

Kim, B., Ha, J.Y., Lee, S., Kang, S., Lee, Y., Rhee, Y..., & Song, J. (2011). AdNext: A Visit-pattern-Aware Mobile Advertising System for Urban Commercial Complexes. In *Proceedings of the 12th Workshop on Mobile Computing Systems and Applications* (pp. 7-12). ACM. https://doi.org/10.1145/2184489.2184492

Laouris, Y., & Eteokleous, N. (2005). We Need an Educationally Relevant Definition of Mobile Learning. In *Proceedings of the 4th World Conference on Mobile Learning*. USA: Neuroscience & Technology Institute Cyprus. (http://goo.gl/zWzanm) (2016-02-15).

Marcos, L., Támez, R., & Lozano, A. (2009). Aprendizaje móvil y desarrollo de habilidades en foros asincrónicos de comunicación [Mobile Learning as a Tool for the Development of Communication Skills in Virtual Discussion Board]. *Comunicar*, *33*(XVII), 93-100. https://dx.doi.org/10.3916/c33-2009-02-009

Martínez, P., Pérez, J., & Martínez, M. (2016). Las TIC y el entorno virtual para la tutoría universitaria. *Educación XXI*, *19*(1), 287-310. https://dx.doi.org/10.5944/educXX1.13942

Ministerio de Educación Nacional (2015-2016). *Calidad en educación superior camino a la prosperidad*. Bogotá: MEN. (http://goo.gl/4OIc7x) (2016-02-14).

Paramythis, A., & Loidl-Reisinger, S. (2004). Adaptive Learning Environments and e-Learning Standards. *Electronic Journal on e-Learning*, *2*(1), 181-194. (http://goo.gl/YcsFvs) (2016-02-15).

Restrepo, B. (2003). *Concepto y aplicaciones de la investigación formativa, y criterios para evaluar. investigación científica en sentido estricto*. Bogotá: CNA. (https://goo.gl/ahVj7P) (2016-02-13).

Sevillano, M.L., Quicios-García, M.P., & González-García, J.L. (2016). Posibilidades ubicuas del ordenador portátil: percepción de estudiantes universitarios españoles [The Ubiquitous Possibilities of the Laptop: Spanish University Students' Perceptions]. *Comunicar*, *46*(XXIV), 87-95. https://dx.doi.org/10.3916/C46-2016-09

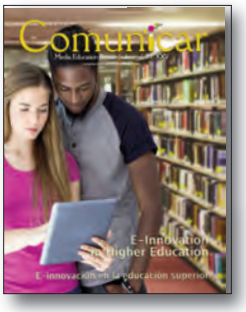
Sevillano, M.L., & Vázquez-Cano, E. (2015). Modelos de investigación en contextos ubicuos y móviles en Educación Superior. *Educatio Siglo XXI*, *33*(2), 329-332.

Torres, A. (1999). La sistematización de experiencias educativas. Reflexiones sobre una práctica reciente. *Pedagogía y Saberes*, 13(4), 5-16.

Velandia, C. (2014). Modelo de acompañamiento y seguimiento en ambientes U-learning. K. Gherab (Presidencia), *Congreso Internacional de Educación y Aprendizaje.* New York: Symposium XXI International Conference on Learning Common Ground in Lander College for Women.

Wayne, W.D. (2003). *Bioestadística: Base para el análisis de ciencias de la salud*. México: Limusa Wiley.

Comunicar, n. 51, v. XXV, 2017 | Media Education Research Journal | ISSN: 1134-3478; e-ISSN: 1988-3478
www.comunicarjournal.com



Using Twitter in Higher Education in Spain and the USA

Uso de Twitter en Educación Superior en España y Estados Unidos

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ABSTRACT

This article examines student teachers' use and perceptions of Twitter, based on a mixed-method comparative approach. Participants (N=153) were education majors who used Twitter as a part of required coursework in their programs at two universities in Spain and the United States. The theoretical background covers research on international work carried out on Twitter as well as a brief overview of the introduction of technology in two educational national systems. Quantitative data were collected via a survey, while qualitative data were obtained from students' reflective written texts. The majority of participants from both contexts perceived educational benefits to Twitter. However, their use of Twitter, and the nature of their perceptions of its educational value, appeared to differ in important ways. The USA participants' longer and more frequent use of Twitter was accompanied by more positive beliefs regarding the educational relevance of Twitter. While many Spanish participants saw value in the use of Twitter to find and share information, USA students highlighted interactive and collaborative uses. The study uncovers some challenges for learning related to Twitter's short format. In the conclusion section we discuss implications for learning and teaching in an age of ubiquitous social media.

RESUMEN

El presente artículo examina los usos y las percepciones de estudiantes y profesores en relación a Twitter a partir de una investigación comparada con metodologías mixtas. Los participantes (n=153) fueron alumnos de educación de dos universidades en España y Estados Unidos (EE.UU.) que usaron Twitter como parte de una actividad del curso. El marco teórico abarca la investigación internacional sobre Twitter así como un breve repaso a la introducción de la tecnología en los dos sistemas educativos nacionales. Los datos cuantitativos se recogieron con un cuestionario mientras que los datos cualitativos se obtuvieron a través de los textos reflexivos escritos de los estudiantes. La mayoría de los participantes de los dos contextos percibieron los beneficios educativos de Twitter. Sin embargo, su uso de Twitter y la naturaleza de sus percepciones en relación a su valor educativo difirieron de forma significativa. Los participantes de EE.UU. usaron Twitter por más tiempo y de manera más frecuente a la vez que demostraron creencias más positivas en relación a la relevancia educativa de Twitter. Mientras que los participantes españoles valoraron el uso de Twitter para encontrar y compartir información, los estudiantes americanos destacaron los usos para la interacción y la colaboración. El estudio destapa algunos retos del formato breve de Twitter para el aprendizaje. En las conclusiones discutimos las implicaciones para la enseñanza aprendizaje en la era de la ubicuidad de los medios sociales.

KEYWORDS | PALABRAS CLAVE

Higher Education, e-learning, teacher training, didactic innovation, educational research, teacher reflection, ICT, social media, Twitter.

Educación Superior, e-learning, formación de profesorado, innovación didáctica, investigación educativa, reflexión docente, TIC, medios sociales, Twitter.

Received: 2016-09-29 | Reviewed: 2016-11-15 | Accepted: 2016-12-05 | Preprint: 2017-02-15 | Published: 2017-04-01
DOI http://dx.doi.org/10.3916/C51-2017-02 | Pages: 19-27

1. Introduction

This article addresses future educators' beliefs about and experiences with educational uses of the microblogging service Twitter. Research has suggested that successful ICT implementation is related to not only hardware and teachers' digital skills, but also to teachers' beliefs and attitudes (Ertmer & Ottenbreit-Leftwich 2013). Furthermore, it has been noted that teachers' attitudes regarding technology are influenced by their own learning experiences with technology as students (Hermans, Tondeur, van Braak, & Valcke 2008). Thus, attention to educators' beliefs and attitudes is considered by many to be necessary for successful ICT integration in educational systems (Teo, 2009; Tirado-Morueta & Aguaded, 2014).

While Twitter is used in many countries and has received significant attention in education (Junco, Heiberger, & Loken 2011; Carpenter & Krutka, 2014a), comparative research on this technology is relatively uncommon. Comparative studies of social media other than Twitter have generally aimed at exploring users' profiles and their habits and routines (Adnan, Leak, & Longleya, 2014; Amichai-Hamburger & Hayat, 2011; Ku, Chen, & Zhang, 2013; Jackson & Wang 2013). However, little previous comparative research on social media has addressed educational applications. Although some research on social media in education has included international samples (Wesely, 2013), a comparative approach that seeks to parse differences among participants from various countries or contexts has been missing.

The current study is based on required, course-based use of Twitter by university students majoring in education fields, which was mainly aimed at enhancing participants' engagement with course content and building their digital skills. It also provided an early experience meant to influence the participants' attitudes and beliefs regarding the use of social media for learning and teaching in their future professional careers. In a previous stage of research (Carpenter, Tur, & Marín, 2016), student teachers' perceptions of Twitter for their learning and their future professional careers were explored. However, some questions arose from this phase: can these perceptions be influenced by students' real usage? Are there differences in the way students use Twitter for educational aims? Also, while the impact on students' learning of some characteristics of Twitter have already been explored, more information was needed and Twitter's format is further explored in this new step. Thus, this article explores relatively under-researched aspects of the impact of ICT and social media in the educational systems of the USA and Spain from a comparative perspective. Analysing students' reported behaviours and perceptions, this work explores commonalities and differences in the impact of social media, and Twitter in particular, on educational experiences in these two countries.

2. Background

2.1. Twitter in education

There is a growing interest regarding Twitter in many research areas. In education, previous studies have focused on the employment of microblogging for learning aims and its possible support of innovative teaching practices. Twitter has been employed for diverse teaching practices since soon after its launch in 2006 (Carpenter & Krutka 2014a; Castañeda, Costa, & Torres-Kompen, 2011). Shah, Shabgahi and Cox (2015) suggested four uses of Twitter for learning: formal and informal learning community, collaborative learning, mobile learning and reflective thinking. Several studies, such as those by Carpenter (2014), Kassens-Noor (2012), Marín and Tur (2014), Mercier, Rattray and Lavery (2015) and Tur and Marín (2015), have explored the enhancement of informal and collaborative learning with Twitter. Some research has suggested that such collaboration can reach the level of a Community of Practice (De-Paoli & Larooy, 2015; Wesely, 2013). Studies have also demonstrated the impact of Twitter on learning and students' engagement (Junco, Heiberger, & Loken, 2011; Junco, Elavsky, & Heiberger, 2013) and in particular to overcome obstacles to participation in the context of large-lecture classrooms (West, Moore, & Barry, 2015). Twitter has been explored as a tool to support teachers' professional development (Carpenter & Krutka, 2014a; 2015). The extant literature has also identified challenges associated with educational uses of Twitter, such as the potential for the information flow to be overwhelming for some users (Davis, 2015).

2.2. ICT and Social Media in the Educational Systems of the USA and Spain

Nowell's (2014) research reported that social media use with U.S. students can improve student-teacher relationships and extend learning beyond the classroom. In the case of Twitter, its use by U.S. educators appears to have been on the rise in recent years (Lu, 2011; University of Phoenix, 2014). Kurtz (2009: 2) described how Twitter provided elementary school parents and families "windows into their children's days", while Hunter and

Caraway (2014) reported that Twitter positively impacted high school students' literature engagement and motivation. Twitter does, therefore, appear to offer real educational potential. It remains to be seen, however, to what degree that potential will be realized.

What is now generally understood is the need in Spain to develop students' digital skills (Area & al., 2014). The Escuela 2.0 programme, which is based on the characteristics of Web 2.0 and social media tools, postulates that every individual can generate and share knowledge (Correa, Losada, & Fernández, 2012). The increased use of Web 2.0 tools for educational aims is likely related to the increase in the use of social media and the development of a knowledge society in Spain. Innovative social media use to support K-12 students collaboration and learning has been documented by Basilotta and Herrada (2013). Blogging by primary and secondary students is quite common, as evidenced by the annual awards "Espiral Edublogs" given to student blogs at all grade levels since 2007 (https://goo.gl/8RMxbO).

Educational activities with Twitter, however, are not yet as common. Muñoz (2012) reported some use of Twitter in the contexts of primary and secondary level history, philosophy, language learning and storytelling activities. Activities from literature classes based on Spanish masterpieces, such as "El Lazarillo de Tormes" (Molina, 2011) or "Don Quijote" (Domenech, 2015), have also been documented.

This paper describes a rather uncommon comparative, mixed-methods study of 153 U.S. and Spanish university students' perceptions of Twitter after they experienced required use of Twitter in one of their teacher education courses. Our paper offers new insights into understanding the perspectives of the university students –who in this case are also the next generation of teachers– regarding the educational value of these technologies and the possibilities of Twitter's format for learning.

3. Research

3.1. Context

This study was set in two different higher education institutions. The sample was one of convenience; the researchers, as employees at these institutions, knew that trainee teachers were using Twitter for required coursework at each university. The University of the Balearic Islands in Spain is the only public university in the region of the Balearic Islands and has different units on the islands of Majorca, Menorca and Ibiza. The university has approximately 11,000 undergraduate and 2000 postgraduate students. Elon University is a private university in the southeast of the United States that enrolls approximately 6000 students.

3.2. Participants

The participants from the University of the Balearic Islands were from the Majorca and Ibiza campuses. They were all students preparing to be teachers, most of them undergraduates (n=85) and, in addition, some postgraduates in Ibiza (n=15). In the case of Majorca, participants were students in their third year of study preparing to be primary school teachers. In Ibiza, primary student teachers were in their first year of study and the other students were studying a Master's degree program in preparation for teaching. The participants (n=53) from Elon University were all undergraduates in their second, third, or fourth year of studies. The Elon students were preparing to be teachers in a variety of subject areas and at the primary and secondary levels.

3.3. Twitter procedure

Participants in both countries used Twitter as a part of required coursework. Tasks varied according to the different courses in which the participants were enrolled. In both contexts, students were required to have a public Twitter account. They had to "follow" the Twitter accounts of their classmates and other educators or educational organizations beyond their classmates. Students were also required to send a minimum number of tweets that included a course hashtag and related to course content. In the U.S., participants also were required to participate in

Twitter chats, which are one-hour long, synchronous Twitter discussions focused on a particular topic (Carpenter & Krutka, 2014b). At semester's end, the students in both settings submitted written reflections on their use of Twitter.

3.4. Research questions

This work aimed to explore the differences in uses of and beliefs regarding social media, in particular Twitter, among students in the USA and Spain. Thus, this study addressed the following research questions:

- Are there differences in the way U.S. and Spanish students use Twitter?
- Are there differences in the way U.S. and Spanish students perceive the educational use of Twitter?
- Are there differences in the way U.S. and Spanish students perceive the short format of Twitter and its impact on learning?

3.5. Methodology

With the aim of a comparative study in mind, we collaborated to design an anonymous online questionnaire to be implemented in both contexts. This instrument, which was designed in Spanish and English to be adapted to each university, gathered quantitative data regarding student experiences with Twitter and their perceptions of Twitter and other social media. At the end of the semester, we asked the participants to write a reflection on their personal experience with the use of Twitter in order to gather qualitative data that would provide rich description and examples to supplement the quantitative findings.

3.6. Instrument

The survey used in Carpenter and Krutka's (2014a; 2015) research on educators' use of Twitter was the starting point for the creation of the instrument for this study. The authors' own experiences and the existing literature on social media use in education informed an initial survey draft in English. We considered cultural differences in order to try to design a survey that would allow participants from both countries to describe their experiences and perceptions. The survey was translated into Spanish, and reviewed by a colleague to ensure that items would be clear to participants. The instrument gathered descriptive statistics regarding the participants, and also included closed questions. The closed questions were measured on nominal or five-point ordinal Likert scales.

4. Results

The questionnaire was answered by 153 participants: 100 education majors from Spain (65.4%) and 53 from the U.S. (34.6%).

a) Research Question 1: Are there differences in the way U.S. and Spanish students use Twitter? Participants were asked about whether they used Twitter for academic and/or personal reasons (Table 1). In both contexts, majorities reported use for academic and personal purposes. Because the participants were required to use Twitter for at least one of their courses, there were only a few respondents who indicated solely personal purposes. A chi-square test for association indicated there was not a statistically significant association between nationality and the balance of academic and personal use, $\chi^2(2) = 1.503$, $p = .472$.

Table 1. Academic and personal use

	% Spain	% US
I use Twitter for academic purposes	42	35.9
I use Twitter for academic and personal purposes	51	60.4
I use Twitter for personal purposes	7	3.8

Participants were also asked about their following behavior on Twitter. The survey allowed respondents to choose from a list of types of Twitter users and indicate a percentage for how much they followed each type. The average percentages are shown in Table 2. While among the U.S. students, classmates (29%), education organizations (19.6%) and friends (17%) were most popular, students from the Spain highlighted other educators –non classroom teachers– (20.2%), classmates (19.2%), education organizations (17.7%) and in-service teachers (17%). Because of outliers and the non-normal distribution of the data, independent-samples t-tests were determined to be inappropriate for analyzing this data, and Mann Whitney U tests were instead conducted. Mean rank scores for U.S. and Spanish students were not significantly different for following of in-service teachers ($U = 2266.5$, $z = -1.480$, $p = .139$), educational organizations, ($U = 2318$, $z = -1.287$, $p = .198$), friends ($U = 2631$, $z = .070$,

p=.944), and celebrities (U= 2494, z=–.628, p=.530). Mean rank scores for U.S. and Spanish participants were, however, statistically significantly different for following classmates (U=1631.5, z= –3.934, p<.001) and other educators who were not classroom teachers (U=1688.5, z=–3.718, p<.001). Respondents were also asked if they followed hashtags apart from the required course hashtag (Table 3). U.S. students were significantly more likely to follow additional hashtags ($\chi 2(1) = 15.832$, p<.001).

Table 2. Which of the following groups or types of people do you follow on Twitter?

	Spain % average	U.S. % average
Classmates	19.2	29.0
In-service teachers	17.0	14.0
Other educators (non classroom teachers)	20.2	10.7
Education organizations	17.7	19.6
Friends	11.3	17.0
Celebrities	7.9	6.9
Other	6.7	2.8

b) Research question 2: Are there differences in the way U.S. and Spanish students perceive the educational use of Twitter? Concerning the uses of Twitter that were most relevant for the students' learning in the course, participants from both universities highlighted resource sharing, reflecting, and communicating with classmates (Table 4). However, opinions regarding the relevance of many other Twitter uses differed between the two countries. For example, for participants from Spain finding up to date information (69%) was also important; whereas for U.S. respondents participating in Twitter chats (79.3%), collaborating with teachers and other educators (60.4%), and engaging in discussions (60.4%) were more relevant. U.S. participants also tended to perceive a wider variety of relevant learning applications for Twitter, selecting on average 5.86 different uses in contrast to 4.02 relevant uses selected by Spanish participants. These differences in relevance may in part be explained by some of the variation in what students were asked to do in the courses in the two countries. That the U.S. students had, on average, been using Twitter longer for academic purposes might also have contributed to their perceiving a wider variety of relevant learning uses.

Table 3. During the semester, did you follow hashtags other than the course hashtag?

	% Spain	% U.S.
Yes	17	47.2
No	83	52.8

Comments from participants' reflections provided more detailed glimpses of their perceptions of the educational use of Twitter. For example, a Spanish student credited Twitter with helping her to integrate ideas from her course: "I think that we have used it most to transmit the information we found on our own and share it, a true cooperative work. It has been useful to me to put in their place the pieces of many concepts that we were working with in class". A U.S. student appreciated the multifaceted nature of Twitter and how participants can tailor their use to meet their needs: "I had the ability to follow and connect with so many people on Twitter this semester. I read articles I may not have encountered had it not been for Twitter. I participated in Twitter chats and met teachers who were supportive and gave me great ideas for the future. I truly learned that you can use it to various extents and for

Table 4. What uses of Twitter have been most relevant for your learning in this course? (Check all that apply)

	Total number Spain	% Spain	Total number U.S.	% U.S.	$\chi^2(1)$	p value
Resource sharing	77	77	40	75.5	0.045	.832
Finding up to date information	69	69	19	35.9	15.58	<.001
Reflection	46	46	17	32.1	2.773	.096
Communicating with classmates	40	40	27	50.9	1.685	.194
Collaborating with teachers and other educators	22	22	32	60.4	22.34	<.001
Engaging in discussions	33	33	32	60.4	10.626	.001
Participating in Twitter chats	6	6	42	79.3	86.317	<.001
Participating in out-of-class activities	30	30	20	37.4	0.942	.332
Participating in in-class activities	21	21	19	35.9	3.956	.047
Communicating with the instructor	13	13	16	30.2	6.662	.010
Networking	9	9	17	32.1	13.076	<.001
Participating in a professional community	8	8	18	34	16.553	<.001
Emotional support	8	8	4	7.6	0.01	.921
Backchanneling (electronic conversation that occurs in parallel to face-to-face conversation)	4	4	5	9.4	1.848	.174
Receiving mentoring from the instructor	2	2	2	3.8	0.428	.513

different purposes. You can use Twitter however it would best meet your needs and that may be different for every person. I learned from my professor, fellow students, and other individuals related to the world of education".

c) Research question 3: Are there differences in the way U.S. and Spanish students perceive the short format of Twitter and its impact on learning?

Although many respondents indicated that they perceived multiple relevant uses of Twitter to support their learning in their courses, there was some apparent ambivalence regarding Twitter's format. One survey item explicitly addressed a potential learning constraint associated with Twitter, asking students their level of agreement with the statement "Twitter's short format has not allowed me to express my ideas." For this item, opinions were quite divided (Table 5). A Mann-Whitney U test was run to determine if there were statistically significant differences in beliefs about the limitations of Twitter's short format between Spanish and U.S. respondents. Distributions of the Likert scores for Spanish and U.S. students were broadly similar, as assessed by visual inspection. Likert scores for U.S. participants were not statistically significantly different from their Spanish peers, U =2273, z =–1.496, p= .135.

A number of students from both Spain and the U.S. commented in their reflection papers on times that they felt that Twitter did not allow them to communicate their ideas in ways that they preferred. For example, one U.S. participant commented, "Too often I had to edit my tweets to be shorter than I had originally intended, which was frustrating as often I could not say exactly what I wanted due to the word limit." And a Spanish student explained,

«I am too introspective to make quick contributions as [Twitter] needs; I think too much about things before doing them. To write a tweet I have to believe what I write or what I retweet is interesting enough. This means reading well what you are going to write, verifying the reliability of what you say and the source that you use, and looking for the ideas that offer different views… all this is impossible [on Twitter], because it wouldn't be so immediate as it is supposed to be».

Table 5. Impact of Twitter's short format

	Country	Strongly agree	Somewhat agree	Neutral	Somewhat disagree	Strongly disagree
Twitter's short format has not allowed me to express my ideas	Spain	9%	28%	24%	29%	10%
	U.S.	11.3%	37.7%	20.8%	26.4%	3.8%
Twitter's short format has helped me to summarise main ideas	Spain	13%	48%	24%	11%	4%
	U.S.	35.9%	41.5%	11.3%	11.3%	0%

Despite such critiques of limitations associated with Twitter's short format, a majority of students from both countries indicated either strongly agree or somewhat agree with the statement "Twitter's short format has helped me to summarise main ideas" (Table 5). A Mann-Whitney U test was run to determine if there were statistically significant differences in beliefs about this particular benefit of Twitter's short format between Spanish and U.S. participants. Distributions of the Likert scores for Spanish and U.S. students were not similar, as assessed by visual inspection. Likert scores for U.S. respondents were statistically significantly lower, indicating stronger agreement, than for Spanish peers, U=1918, z=–2.979, p=.003.

5. Discussion and conclusion

Twitter is sometimes dismissed as the frivolous domain of oversharing teens, vain celebrities, and relentless self-promoters, but in reality these media impact a wide range of serious phenomena such as journalism, political campaigning, protest movements, business marketing, and charity fundraising (Shirky, 2011; Theocharis, Lowe, van Deth, & García-Albacete, 2015). Our results suggest that students from two different countries perceived that Twitter can also have a meaningful impact in the educational sphere. Students from both contexts indicated they followed classmates and other professional users or institutions more than friends or celebrities, suggesting that despite its reputation, Twitter may be an appropriate tool for educational and professional aims.

The potential for flexible and open learning associated with the introduction of social media into education (Salinas, 2013; Marín, Negre, & Pérez-Garcías, 2014; Marín & Tur, 2014), together with policies in the USA and Spain that have promoted the integration of ICT in schools, indicate that teacher education programmes should consider how to prepare prospective teachers for new and challenging learning environments. Furthermore, if educators' attitudes and beliefs about teaching and learning with technology are formed at early stages, even while they themselves are students (Hermans, Tondeur, van-Braak, & Valcke, 2008), and if beliefs can become the most important barriers for future uptake (Ertmer & Ottenbreit-Leftwich, 2013), it seems that teacher education pro-

grammes should attend to their students' beliefs and perceptions regarding educational uses of technology.

The current work is in line with recent research that focused on attitudes and beliefs for successful ICT integration in educational institutions (Teo 2009; Tirado-Morueta & Aguaded, 2014). Furthermore, this work is a step forward in research since it considers educational usages, affordances and drawbacks from a comparative perspective.

In the case of our participants, many in Spain and some in the United States revealed that they had not previously used Twitter for educational purposes, and quite a few expressed surprise at realizing such applications for Twitter. This fact reinforces the need to provide supposed "digital native" students with guidance regarding educational applications of technologies; young people do not inevitably recognize and/or engage with technologies' learning affordances (Luckin & al., 2009). Scaffolded learning experiences with social media could help to change attitudes and beliefs towards more favourable positions. However, despite majorities in both contexts indicating that they did see educational potential in Twitter, there were still some students who remained skeptical. In our sample, data showed that students in Spain mostly used Twitter for academic purposes for the first time during the semester of our research, whereas more U.S. participants had previously engaged in academic uses of Twitter.

Our research aligns with previous studies that have suggested Twitter's capacities to impact student learning, especially in terms of collaboration skills, participation, engagement, and course results (Carpenter, 2014; Junco, Heiberger, & Loken, 2011; Junco, Elavsky, & Heiberger, 2013; Kassens-Noor, 2012; West, Moore, & Barry, 2015). With the aim of exploring particular aspects of this impact, this current research has observed that Twitter has mostly involved students in sharing and finding resources, debating and communicating and, reflecting. Qualitative data confirms this impact, with many of the students noting their surprise regarding the educational value of these activities. Also, the very few comments in Spain about having followed external hashtags is coherent with the low percentage achieved by items related to external discussions. Furthermore, written reflections by students in both countries note the potentially overwhelming impact of access to so much information, which is consistent with conclusions by Davis (2015). Considering the main educational usages of Twitter defined in prior research (Shah, Shabgahi, & Cox, 2015) it seems that students have observed the impact of Twitter for formal and collaborative learning and reflection, and more work would be needed to also enhance informal and mobile learning.

The data suggest positive attitudes among participants towards their own learning experiences with Twitter. Our research may encourage educators to consider ways in which Twitter can be leveraged to support learning, and contextual factors that may affect how social media are utilized and experienced in different settings. We found a number of significant differences between the perceptions and intentions of the participants from the two different countries, some that appeared to be rooted in differences in digital cultures.

When comparing the experiences of the participants from Spain and the U.S., the U.S. context appeared to be one in which the greater presence of chats and hashtags created more opportunities for Twitter interactions that were attractive to the participants. Van-Dijck (2011) noted that Twitter can be used in a variety of ways; while chats in the U.S. may have allowed participants to use Twitter more as a two-way communication tool, the less prevalent chat and hashtag use by the Spanish participants may have defined Twitter for them as more of an information and resource sharing tool. Although such sharing can be worthwhile, it may be a less compelling reason for trainee teachers to utilize Twitter if they are already accustomed to accessing more traditional media for information acquisition.

Rather than identifying differences in the general, monolithic U.S. and Spanish cultures that affected the participants' perceptions of Twitter, our findings thus appear to suggest that differences in online practices associated with how technologies are employed in different countries or regions may influence users' perceptions and uses of

technology. Although offline cultures likely influence online behaviors in many cases, there may not always be solely a one-way causal relationship (Qiu, Lin, & Leung, 2013).

Future implementations of educational activities with Twitter should explore the possibilities of two challenging lines of research. First of all, international collaboration among students could be an interesting new iteration since there is evidence that an interactive use of the Internet is related to higher academic achievement (Torres-Díaz, Duart, Gómez-Alvarado, Marín-Gutiérrez, & Segarra-Faggioni, 2016). Secondly, how educational applications of Twitter can contribute to the development of high level thinking skills appears to be an area worthy of exploration.

This study is limited by convenience sampling, which resulted in different group sizes from the two different countries. However, our findings offer a beginning step in research in which the challenging and promising focus is the learning impact that Twitter can have in different academic contexts. Before future research can compare the learning context in greater depth, some previous knowledge on general usage and perception was needed. Thus, from now on, further comparative studies can explore the nuances of the impact of Twitter observed in this study. Future work is needed to promote the educational usage of social media for high level cognitive skills, such as reflection, critical thinking skills, and self-regulated learning, as suggested by recent research (Herro, 2014; Matzat & Vrieling, 2015), and explore the possible differences in terms of age and gender. Finally, since cultural factors could impact social media usage (Carpenter, Tur, & Marín, 2016) new research could address Twitter usage in terms of cultural differences in two main ways: on the one hand, for example, addressing how cultural differences in social norms and anxiety (Heinrichs, & al ,2006) could influence students' behavior in Twitter; on the other hand, focusing on the educational system, how cultural differences in teaching and learning processes –see for example the model of the four dimensions (Hofstede, 1986)– could influence usages and perceptions of Twitter and social media in general. Likewise, since a process of Americanization of the Spanish Higher Education system has been reported (Lalueza & Collell, 2013), it would be challenging to explore how Twitter is contributing to this phenomenon.

References

Adnan, M., Leak, A., & Longleya, P. (2014). A Geocomputational Analysis of Twitter Activity around Different World Cities. *Geo-spatial Information Science*, *17*(3), 145-152. https://doi.org/10.1080/10095020.2014.941316

Amichai-Hamburger, Y., & Hayat, Z. (2011). The Impact of the Internet on the Social Lives of Users: A Representative Sample from 13 Countries. *Computers in Human Behavior*, *27*, 585-589. https://doi.org/10.1016/j.chb.2010.10.009

Area, M., Alonso, C., Correa, J.M., del-Moral, M.E., de-Pablos, J., Paredes, J., Peirats, J., Sanabri, A.L., San-Martín, A., & Valverde, J. (2014). Las políticas educativas TIC en España después del Programa Escuela 2.0: Las tendencias que emergen. *Relatec*, *13*(2), 11-33. https://doi.org/10.17398/1695-288X.13.2.11

Basilotta, V., & Herrada, G. (2013). Aprendizaje a través de proyectos colaborativos con TIC. Análisis de dos experiencias en el contexto educativo. *Edutec, 44*. (https://goo.gl/CwdssM) (2016-10-10).

Carpenter, J.P. (2014). Twitter's Capacity to Support Collaborative Learning. *International Journal of Social Media and Interactive Learning Environments*, *2*(2), 103-118. https://doi.org/10.1504/IJSMILE.2014.063384

Carpenter, J.P., & Krutka, D.G. (2014a). How and Why Educators Use Twitter: A Survey of the Field. *Journal of Research on Technology in Education*, *46*(4), 414-434. https://doi.org/10.1080/15391523.2014.925701

Carpenter, J.P., & Krutka, D.G. (2014b). Chat it Up: Everything you Wanted to Know about Twitter Chats but Were Afraid to Ask. *Learning and Leading with Technology*, *41*(5), 10-15. (https://goo.gl/zptefV) (2016-10-10).

Carpenter, J.P., & Krutka, D.G. (2015). Engagement through Microblogging: Educator Professional Development via Twitter. *Professional Development in Education*, *41*(4), 707-728. https://doi.org/10.1080/19415257.2014.939294

Carpenter, J.P., Tur, G., & Marín, V.I. (2016). What do USA and Spanish Pre-service Teachers Think about Educational and Professional use of Twitter? A Comparative Study. *Teaching and Teacher Education*, *60*, 131-143. https://doi.org/10.1016/j.tate.2016.08.011

Castañeda, L., Costa, C., & Torres-Kompen, R. (2011). *The Madhouse of Ideas: Stories about Networking and Learning with Twitter.* Conference 2011, Southampton, UK. (https://goo.gl/BWtO5L) (2016-10-10).

Correa, J., Losada, D., & Fernández, L. (2012). Políticas educativas y prácticas escolares de integración de las tecnologías en las escuelas del País Vasco: Voces y cuestiones emergentes. *Campus Virtuales*, *1*(1), 21-30. (https://goo.gl/szxG2K) (2016-10-10).

Davis, K. (2015). Teachers' Perceptions of Twitter for Professional Development. *Disability and Rehabilitation*, *37*(17), 1551-1558. https://doi.org/10.3109/09638288.2015.1052576

De-Paoli, S., & Larooy, A. (2015). Teaching with Twitter: Reflections on Practices, Opportunities and Problems. Paper in *EUNIS 2015*, Dundee, Scotland (UK), 10-12 June. (https://goo.gl/tqxx0h) (2016-10-10).

Domenech, M. (2015). *Completamente quijotizados. La rebotica de literlengua*. [Web log post]. (https://goo.gl/J8BTjt) (2016-10-10).

Ertmer, P.A., & Ottenbreit-Letwich, A. (2013). Removing Obstacles to the Pedagogical Changes Required by Jonassen's Vision of Authentic-enabled Learning. *Computers & Education*, *64*, 175-182. https://doi.org/10.1016/j.compedu.2012.10.008

Heinrichs, N., Rapee, R.M., Alden, L.A., Bögels, S., Hofmann, S.G., Oh, K.J., & Sakano, Y. (2006). Cultural Differences in Perceived Social Norms and Social Anxiety. *Behaviour Research and Therapy*, *44*(8), 1187-1197. https://doi.org/10.1016/j.brat.2005.09.006

Hermans, R., Tondeur, J., Van-Braak, J., & Valcke, M. (2008). The Impact of Primary School Teachers' Educational Beliefs on the

Classroom Use of Computers. *Computers & Education*, 51, 1499-1509. https://doi.org/10.1016/j.compedu.2008.02.001
Herro, D. (2014). Techno Savvy: A Web 2.0 Curriculum Encouraging Critical Thinking. *Educational Media International*, *51*(4), 259-277. https://doi.org/10.1080/09523987.2014.977069
Hofstede, G. (1986). Cultural Differences in Teaching and Learning. *International Journal of Intercultural Relations*, *10*(3), 301-320. https://doi.org/10.1016/0147-1767(86)90015-5
Hunter, J.D., & Caraway, H.J. (2014). Urban Youth Use Twitter to Transform Learning and Engagement. *The English Journal*, *103*(4), 76-82. (https://goo.gl/xFZA9h) (2016-10-10).
Jackson, L., & Wang, J.L. (2013). Cultural Differences in Social Networking Site Use: A Comparative Study of China and the United States. *Computers in Human Behavior*, *29*, 910-921. https://doi.org/10.1016/j.chb.2012.11.024
Junco, R., Elavsky, M.C., & Heiberger, G. (2013). Putting Twitter to the Test: Assessing Outcomes for Student Collaboration, Engagement and Success. *British Journal of Education Technology*, *44*(2), 273-287. https://doi.org/10.1111/j.1467- 8535.2012.01284.x
Junco, R., Heiberger, G., & Loken, E. (2011). The Effect of Twitter on College Student Engagement and Grades. *Journal of Computer Assisted Learning*, *27*(2), 119-132. https://doi.org/ 10.1111/j.1365-2729.2010.00387.x
Kassens-Noor, E. (2012). Twitter as a Teaching Practice to Enhance Active and Informal Learning in Higher Education: The Case of Sustainable Tweets. *Active Learning in Higher Education*, *13*(1), 9-21. https://doi.org/10.1177/1469787411429190
Ku, Y.C., Chen, R., & Zhang, H. (2013). Why do Users Continue Using Social Networking Sites? An Exploratory Study of Members in the United States and Taiwan. *Information & Management*, *50*, 571-581. https://doi.org/10.1016/j.im.2013.07.011
Kurtz, J. (2009). Twittering about learning: Using Twitter in an Elementary School Classroom. *Horace*, *25*(1), 1-4. (https://goo.gl/QhALU2) (2016-10-10).
Lalueza, F., & Collell, M.R. (2013). Globalization or Americanization of Spanish Higher Education? A Comparative Case Study of Required Skills in the Higher Education Systems of the United States and Spain. *Razón y Palabra*, *17*(4-85). (https://goo.gl/2A54Df) (2016-10-10).
Lu, A. (2011). Twitter Seen Evolving into Professional Development Tool. *Education Week*, *30*(36), 20. (https://goo.gl/jA70Ho) (2016-10-10).
Luckin, R., Clark., W., Graber, R., Logan, K., Mee, A., & Oliver, M. (2009). Do Web 2.0 Tools really Open the Door to Learning? Practices, Perceptions and Profiles of 11-16 year-old Students. *Learning, Media and Technology*, *34*(2), 87-104. https://doi.org/10.1080/17439880902921949
Marín, V.I., Negre, F., & Pérez-Garcias, A. (2014). Entornos y redes personales de aprendizaje (PLEPLN) para el aprendizaje colaborativo [Construction of the Foundations of the PLE and PLN for Collaborative Learning]. *Comunicar*, *42*, 35-43. https://doi.org/10.3916/C42-2014-03
Marín, V.I., & Tur, G. (2014). Student Teachers' Attitude towards Twitter for Educational Aims. *Open Praxis*, *6*(3), 275-285. https://doi.org/10.5944/openpraxis.6.3.125
Matzat, U., & Vrieling, E.M. (2015). Self-regulated Learning and Social Media - A 'Natural Alliance'? Evidence on Students' Self-regulation of Learning, Social Media Use, and Student-teacher Relationship. *Learning, Media and Technology*, *41*(1), 73-99. https://doi.org/10.1080/17439884.2015.1064953
Mercier, E., Rattray, J., & Lavery, J. (2015). Twitter in the Collaborative Classroom: Micro-blogging for In-class Collaborative Discussions. I*nternational Journal of Social Media and Interactive Learning Environments*, *3*(2), 83-99. https://doi.org/10.1504/IJSMILE.2015.070764
Molina, A. (2011). *El Lazarillo de Tormes en Twitter. Plataforma Educa*. [Web log post]. (https://goo.gl/Zn9QB4) (2016-10-10).
Muñoz, F. (2012). *Experiencias didácticas con Twitter. Educa con TIC*. [Blogpost]. (https://goo.gl/UPgyVk) (2016-10-10).
Nowell, S.D. (2014). Using Disruptive Technologies to make Digital Connections: Stories of Media Use and Digital Literacy in Secondary Classrooms. *Educational Media International*, *51*(2), 109-123. https://doi.org/10.1080/09523987.2014.924661
Salinas, J. (2013). Enseñanza flexible y aprendizaje abierto, fundamentos clave de los PLEs. In L. Castañeda, & J. Adell (Eds.), *Entornos personales de aprendizaje: Claves para el ecosistema educativo en Red* (pp. 53-70). Alcoy: Marfil.
Shah, N.A.K., Shabgahi, S.L., & Cox, A.M. (2015). Uses and Risks of Microblogging in Organisational and Educational Settings. *British Journal of Educational Technology*, *47*(6), 1168-1182. https://doi.org/10.1111/bjet.12296
Shirky, C. (2011). Political Power of Social Media: Technology, the Public Sphere, and Political Change. *Foreign Affairs*, *90*(1), 28-41. (https://goo.gl/1Th2FL) (2016-10-10).
Teo, T. (2009). Modelling Technology Acceptance in Education: A Study of Pre-service Teachers. *Computers & Education*, *52*(2), 302-312. https://doi.org/10.1016/j.compedu.2008.08.006
Theocharis, Y., Lowe., W., Van-Deth, J.W., & García-Albacete, G. (2015). Using Twitter to Mobilize Protest Action: Online Mobilization Patterns and Action Repertoires in the Occupy Wall Street, Indignados, and Aganaktismenoi movements. *Information, Communication & Society*, *18*(2), 202-220. https://doi.org/ 10.1080/1369118X.2014.948035
Tirado-Morueta, R., & Aguaded, I. (2014). Influencias de las creencias del profesorado sobre el uso de la tecnología en el aula. *Revista de Educación*, *363*, 230-255. https://doi.org/10-4438/1988-592X-RE-2012-363-179
Torres-Díaz, J.C, Duart, J.M., Gómez-Alvarado, H.F., Marín-Gutiérrez, I., & Segarra-Faggioni, V. (2016). Internet Use and Academic Success in University Students. [Usos de Internet y éxito académico en estudiantes universitarios]. *Comunicar*, *48*(24), 61-70. https://doi.org/10.3916/C48-2016-06
Tur, G., & Marín, V.I. (2015). Enhancing Learning with the Social Media: Student Teachers' Perceptions on Twitter in a Debate Activity. *New Approaches in Educational Research*, *4*(1), 46-53. https://doi.org/10.7821/naer.2015.1.102
Van-Dijck, J. (2011). Tracing Twitter: The Rise of a Microblogging Platform. *International Journal of Media and Cultural Politics*, *7*(3), 333-348. https://doi.org/10.1386/macp.7.3.333_1
Wesely, P.M. (2013). Investigating the Community of Practice of World Language Educators on Twitter. *Journal of Teacher Education*, *64*(4), 305-318. https://doi.org/10.1177/0022487113489032
West, B., Moore, H., & Barry, B. (2015). Beyond the Tweet: Using Twitter to Enhance Engagement, Learning, and Success among First-year Students. *Journal of Marketing Education*, *37*(3), 160-170. https://doi.org/10.1177/0273475315586061

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© ISSN: 1134-3478 • e-ISSN: 1988-3293

Comunicar, n. 51, v. XXV, 2017 | Media Education Research Journal | ISSN: 1134-3478; e-ISSN: 1988-3293
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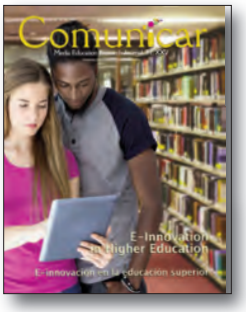

Social Labs in Universities: Innovation and impact in Medialab UGR

Laboratorios sociales en Universidades: Innovación e impacto en Medialab UGR

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ABSTRACT

Social laboratories, defined as experimental spaces for co-creation, have recently become the main centers of innovation. Medialabs are experimental laboratories of technologies and communication media which have co-evolved along with the digital society into mediation laboratories of citizen experimentation, observing a confluence of both models. In recent years, these centers have expanded within the higher education context, generating new forms of innovation and posing the question of how to measure the impact of such open spaces. This paper analyzes the origin and development of social laboratories in Spain. It first reviews their historical development from their antecedents in the 19th Century to the most recent initiatives. It focuses specifically on initiatives launched within the university context, highlighting their role as motors of innovation. Then, it presents the case of Medialab UGR, a co-creation and digital culture center of social collaboration framed in the digital context. Finally, it offers a first approach towards the assessment of its social impact by using Twitter and analyzes its capacity to mobilize and reach non-academic audiences. The findings show the plurality of actors involved in this type of networks as well as the difficulty and complexity of the task for the development of indicators that can comprise both, academic and social interests.

RESUMEN

Los laboratorios sociales, como espacios de experimentación y cocreación, se han convertido en una de las principales instituciones de innovación en nuestros días. En este marco, los medialabs surgen como un tipo de laboratorios centrados en la experimentación con tecnologías y medios de comunicación y evolucionan, con el desarrollo de la sociedad digital, hacia laboratorios de mediación ciudadana e innovación social. En los últimos tiempos se ha producido una expansión de estos modelos en el contexto universitario, generando casos de gran interés para el desarrollo de nuevas métricas del impacto académico en la sociedad. El presente trabajo aborda, en primer lugar, el concepto, origen y desarrollo de los laboratorios sociales en España y globalmente, centrándose específicamente en el espacio universitario y en los medialabs. En segundo lugar, expone la problemática de las métricas alternativas del impacto social, aportando una propuesta de análisis basada en Twitter como herramienta para identificar los distintos tipos de públicos que muestran interés y el nivel de participación que despierta su actividad. Por último, se aplica este análisis al caso de Medialab UGR en la Universidad de Granada, un laboratorio de cultura digital enfocado en la cocreación y colaboración social. Los resultados muestran la pluralidad de actores vinculados a este tipo de redes, así como la dificultad y complejidad de establecer indicadores que concilien tanto intereses académicos como sociales.

KEYWORDS | PALABRAS CLAVE

Medialab, altmetrics, digital culture, digital society, social impact, Twitter, social media, innovation.
Medialab, altmetrics, cultura digital, sociedad digital, impacto social, Twitter, redes sociales, innovación.

Received: 2016-10-03 | Reviewed: 2016-11-16| Accepted: 2016-12-05 | Preprint: 2017-02-15 | Published: 2017-04-01
DOI: https://doi.org/10.3916/C51-2017-03 | Pages: 29-38

1. Introduction

Social laboratories are platforms created to address social challenges. They are characterized by: 1) a social perspective, gathering together people with different backgrounds and approaches to working together; 2) an experimental perspective, dealing with cyclical creation processes; and, 3) a systemic perspective, working on the generation of prototypes that can solve great challenges. This is how Hassan (2014) explains it in his book "The Social Labs Revolution: A New Approach to Solving our Most Complex Challenges". Here, he analyses the rise of this kind of platforms, which have developed particularly during the last two decades. Despite the great interest they currently generate, social experimentation and citizen participation are not recent approaches, but are deeply rooted intthe beginning of the 20th century, as we will detail in section 1.1.

This paper addresses the historical development of social laboratories, paying special attention to the role of medialabs, which are born in the university environment based on the concept of the social laboratory. The recent expansion of these digital innovation and social spaces in Spain, and their heterogeneity, brings new challenges, both in their structure and in the evaluation of their activity. With a triple orientation, university medialabs intend to, on the one hand, serve as a nexus between society and academia, resulting int a space for social co-creation and collaboration. Hence their teaching and informational profile, which serves as a bidirectional channel where citizens and researchers can influence each other and share knowledge. Furthermore, their research profile stands out as the engine of educational, social, and digital innovation. This research perspective makes them the ideal place for the experimentation and testing of new technologies, and educational and social involvement formulas. Due to this triple challenge, this paper aims to:

- Contextualize the phenomenon of social laboratories and, especially, medialabs in Spain, and in the university environment through a revision of the main historical milestones that define their development and evolution.
- Analyze the challenges these centers face in relation to the evaluation and development of indicators, and suggest the use of social networks as a strategy to monitor the acceptance of their proposals in different social sectors.
- Present the case of Medialab UGR as an example of a university initiative in the creation of social and innovative spaces for the co-creation of knowledge.

1.1. The origin of social laboratories and medialabs: definition and typologies

In the field of education, John Dewey founded the Laboratory School in 1896, a school partnered to the University of Chicago where they addressed educational innovation from an experimental approach. Dewey criticized the passivity of attitudes and the homogeneity of teaching methods (Dewey, 2009: 73). In contrast, he developed a method to produce innovation through an approach of learning by doing, while he designed a space where he could test the formulated theoretical proposals. The combination of methodological design, test in real environments, and impact evaluation is common to the current approaches of intervention in small social communities. These proposals can be escalated based on their viability and effectiveness.

Wilbur C. Phillips, within the field of Public Health, developed a social organization model named social unit plan. Created between 1917 and 1920, it consisted of a system that allowed a shared management of community issues by the citizens and the experts themselves. Phillips (1974) wrote about his experience in the work "Adventuring for democracy" published in 1940. In this case, citizen participation in the development of solutions to common problems together with the contribution of experts serves as an example of the application of the co-creation approaches which are currently being developed. There is equal recognition of the value of socially distributed knowledge as well as the opposing notion of specialized and accredited knowledge.

With the democratization of access to technology, social laboratories began to experiment with technology. This has led to a merging of these laboratories and medialabs in their approach to society. The medialab, as such, was created at the Massachussets Institute of Techonology (MIT) in 1985, leading to similar initiatives in other places. Ruiz & Alcalá (2016) refer to other former initiatives in the 1970s as "pioneer labs": EAT - Experiments in Art and Technology (New York, 1963), CAVS – Center for Advanced Visual Studies (Massachusetts, 1967), and Generative Systems (Chicago, 1968). Within "modern labs", apart from the MIT Medialab, we can find initiatives such as ZKM (Karlsruhe, Germany, 1989), ARS Electronica Center (Linz, Austria, 1996), or NTT – Intercommunication Center (Tokyo, Japan, 1997). However, we cannot firmly confirm that current medialabs descend directly from them. This is the case of the "P" Space (https://goo.gl/cqsBqb), a pioneer project created in Madrid in the 1980s by a private initiative without any existing connection to an institution.

Nowadays, the reach of the medialab model, in its different forms, has suffered a significant shift due to the social expansion of digital technologies. The contemporary vision of a medialab is that of a laboratory where the influence of technology in social transformation towards an active society is explored. This evolution has meant that the "Media" part of these laboratories no longer focuses on the concept of mass media but of mediation (Ruiz & Alcalá, 2016). These mediation laboratories are framed within the digital culture framework. The rapid democratization of technology has transformed medialabs, which no longer present a technological profile but a social perspective (Tanaka, 2011: 1).

In "Estudio/Propuesta para la creación de un Centro de Excelencia en Arte y Nuevas Tecnologías" (Alcalá & Maisons, 2004: 8; cited by Martín, 2016) the medialab is defined as the new basilica for the organization of speeches; the meeting point for the traveler, and the stage for all the common experiences which require individual submission to the formulation of its new game rules. More recently, we can find new types of laboratories such as hacklabs, makespaces, fablabs, citylabs, etc.

There are many approaches to classifying new types of medialabs. Tanaka (2011) distinguishes the following:

• Industry labs. Medialabs based on the model of research and development sustained by the industry. For instance: Bell Labs or IBM TJ Watson.

• Media art labs. Laboratories which use technology for artistic experimentation. European projects such as Ars Electronica Futurelab (Linz) and ZKM Center for Art and Media (Karlsruhe) are references here. There are also more recent initiatives focused on media innovation (Salaverría, 2015).

> The recent expansion of these digital innovation and social spaces in Spain, and their heterogeneity, brings new challenges, both in their structure and in the evaluation of their activity. With a triple orientation, university medialabs intend to, on the one hand, serve as a nexus between society and academia, resulting int a space for social co-creation and collaboration. Hence their teaching and informational profile, which serves as a bidirectional channel where citizens and researchers can influence each other and share knowledge. Furthermore, their research profile stands out as the engine of educational, social, and digital innovation.

• University Labs. They are created in the university environment focused on innovation and entrepreneurship. A good example of this is the Experimental Media and Performing Arts Center (EMPAC) at the Rensselaer Polytechnic Institute.

• Citizen labs. They are socially involved and based on citizen participation with a Do-It-Yourself philosophy. One of the main examples of citizen labs is the Medialab Prado in Madrid, a reference in Spain.

1.2. Social laboratories in Spain and their development in the universities

In recent years, many initiatives have been launched by social laboratories, both public and private. It is difficult to establish a common pattern among them. In places described as labs, we find a wide range of diversified proposals. The unquestionable referent in Spain is Medialab Prado (https://goo.gl/SSKVE), a project from the local council in Madrid founded in 2000. It is defined as "a critical center dedicated to cultural production through experimentation with digital technologies". They focus "their research on the intersection between art, science, technology, and society, where the interdisciplinarity brings together hackers, artists, academia, cultural producers, humanists, social scientists, and programmers who meet to experiment in the development of prototypes" (Estalella, Rocha, & Lafuente, 2013: 30).

Tanaka (2011) points out that the changes tested by European universities based on the Bologna process have fostered the emergence of this type of more experimental centers, with an outstanding focus on the development of

competences. Some examples are Media Lab Helsinki (Aalto University) or Paragraphe (Université Paris 8). Another center is Nebrija MediaLab (https://goo.gl/4dp1x4), an initiative of the University of Nebrija that pursues the development of competences in the degrees taught at the Faculty of Communication Sciences (Grijalba & Toledano, 2014). This is a more educational approach with a special interest in media, rather than a wider approach focused on digital culture.

In Ibero-America, there are many different and interesting initiatives within the program of citizen innovation laboratories (https://goo.gl/xtO0Zh), and the program organized by the General Ibero-American Secretary and Medialab-Prado. This is the case of Open Labs (https://goo.gl/P0V3pw) at the Tecnológico de Monterrey. It is defined on its website as "a platform to deal with the complexity of the social from the principles of openness, experimentation, inclusion, diversity, participation, and cooperation". Ecuador is another country where different university medialabs have been created (i.e. Medialab UTPL).

2. Technological and social experimentation in the university through social laboratories

2.1. The laboratories in the frame of social innovation and the digital culture

Medialabs are built on the concept of social innovation. This concept is defined as the development and implementation of new technologies (products, services, and models) that satisfy community needs, and create new relationships and social collaborations (European Commission, 2013: 6). Social innovation transcends social entrepreneurship, it focuses on strategies, methods, and theories for change, promoting citizen participation in the development of shared solutions (Phills, Deiglmeier, & Miller, 2008). The concept of social innovation is wide enough to become the meeting point of public and private interests and projects, through the vision of the citizen as a prosumer (Scolari, 2008). The European Union has located it within the strategy of Europe for 2020 as a key player to stimulate innovation, entrepreneurship, and the knowledge society (European Commission, 2013).

Following this line of thought, Casebourne & Armstrong (2014) identify six key communities in the innovative European ecosystem:

- Communities of open software and hardware.
- Communities of developers, linked to start-ups.
- Laboratories of innovation, including Living Labs, Fablabs, Makespaces, etc.
- Communities of open data and open knowledge.
- Smart citizens.
- Communities of open democracy.

The role of the universities focused on innovation (European Union/The Young Foundation, 2010: 82) can be essential for social development. They offer safe spaces crucial for fostering and promoting innovation. According to Ruiz and Alcalá (2016: 15), "the transformation of traditional centers that implemented traditional cultures into dialogue spaces, creative ecosystems, dedicated to reflection and debate, research and production, training and socialization" is a key issue. This transformation is taking place in the university environment, the natural place for this type of experiences but, at the same time, resistant to innovations that involve institutional changes.

To understand the role of medialabs in promoting social innovation we must consider digital culture as the central concept of their program. Romero (2013: 30) outlines an agenda with elements which are common to the work plans of these laboratories:

- The analysis and participation in multiple digital cultures: culture of screens, of oral, of remix, of visual, of transmedia, of prototype, and design.
- Open culture derived from open software.
- The hacker ethics.
- The interdisciplinarity / transdisciplinarity / multidisciplinarity.
- The combination of transversatility and specialization.
- The co-creation and the replacement of coauthorship and the academic recognition.
- The entrepreneurship and the innovation testing new ways of knowledge transference and connections with the society.

2.2. Laboratories as an engine for innovation at the University

Social laboratories share the following operational principles (Kieboom, 2014):

- "Show it, don't tell". There is a clear orientation to action and prototypes.

• Consideration of the user as an expert. The participants act as the engine for the laboratory through their needs and capacities.

• Centered in ambitious social challenges. They pay attention to systematic problems in opposition to more contingent situations.

• Ask about the system where it is inmersed. It sets out alternative operation models.

• Development of new methodologies for change. The process is, at least, as important as the final output.

• Multidisciplinarity and transversality, forming teams with people from different backgrounds.

• Scalation of proposals. The aim of these proposals is that, once tested, they can be applied in other contexts.

Medialabs promote the value and potential of the digital culture, allowing a better fit in the informational environment developed in the digital society. From a university perspective, it is not easy to find the right place for these laboratories. Their origin is usually in disciplinary spaces like Departments or Faculties, looking for an institutional recognition. The same happens in the frame of public institutions, such as Medialab Prado and the difficulty to fit it within the local council, as its director, Marcos García, states (2015).

The development of medialabs in the university environment creates new opportunities for innovation, incorporating the hacker spirit (Himanen, 2003) within institutions which are sometimes hundreds of years old. Digital transformation, openness, and social implication acquire a new dimension which is uncommon in higher education institutions. Medialabs co-exist with other managerial approaches where quality processes are prioritized, involving in many cases, a bureaucratic load which prevents innovation and experimentation. Medialabs can "hack" university structures in order to present alternative models in issues that require a more agile and flexible development such as, the relation with society or new technologies and epistemic models.

Medialabs allow the development of a social epistemology (Kusch, 2011), shared and collective (Surowiecki, 2005), where academia is an actor inside the community, within an environment in which knowledge is distributed. Here we highlight the role of the commons. These are "resources and collective goods managed in common through particular governance methods and whose property regimen is neither public nor private" (Estalella, Rocha, & Lafuente, 2013: 25).

These centers are characterized by an open and social conception. There are two ways to understand this relationship: 1) through a transference approach based on the quadruple helix (Arnkil & al., 2010) where society becomes the fourth pillar, and 2) citizen science (Socientize Consortium, 2013: 6). Medialabs serve as innovators in universities in the sense that they apply principles and methods learnt from the digital environment. They trigger innovation processes which are open and shared. They are configured like generative platforms focused on production, in opposition to the idea of a closed website that shows contents to consumer users. They are also a means to explore the continuity of the physical and digital dimensions, far from fake dichotomies between "the real" and "the virtual". An example of this is the Campo de Cebada in Madrid. It is a citizen initiative celebrated in the category of "digital communities" in the annual awards of the Ars Electronica (Magro & García, 2012).

2.3. Social impact

A serious problem problem in academia is the assessment of impact. It is traditionally based on the research activity of universities, teaching quality or knowledge transference. There is a fourth transversal dimension: social impact. An example of that is the last Research Evaluation Framework that took place in the UK. The aim of this evaluation was to evaluate the benefits that universities brought to society (Wilsdon & al., 2015).

In the case of medialabs, the evaluation must combine both quantitative and qualitative indicators. This is even more complicated if we consider the nature of the digital devices created or the assessment of methodological learning, independent of its final success. This new approach is rooted in social claims and the development of the digital culture. Therefore, fields like bibliometrics are expanding their range of interests towards social media, developing new alternative indicators (Priem, 2013; Torres-Salinas, Cabezas-Clavijo & Jiménez-Contreras, 2013).

3. A proposal for the assessment of social impact

In this section, we suggest the use of social networks as a tool to monitor and measure the social impact of this type of academic initiatives open to society. Social networks offer an opportunity and a challenge to identify different impacts from those which are found in the sciences. This is something particularly needed in university medialabs. The birth of Web 2.0 and its ongoing adoption in the research community (Cabezas-Clavijo, Torres-Salinas, & Delgado-López-Cózar, 2009) brought an opportunity to trace new evidences in the use of scientific publications

beyond citation. This gave rise to "Scientometrics 2.0" as Priem & Hemminger (2010) called it. Since then, a new research trend focused on the analysis of these new metrics called "altmetrics" has emerged (Torres-Salinas, Cabezas-Clavijo, & Jiménez-Contreras, 2013). These new metrics have provoked great reat interest from evaluators and policy makers measuring the impact of research on non-academic audiences (Wilsdon & al., 2015). Nevertheless, no methodology has yet been developed showing the value of the altmetrics to measure the social impact of research (Sugimoto & Larivière, 2016).

The main shortcoming these studies have is their similarity to the citation model: they look for mentions of research papers. The fact that they try to establish a link with the publication when looking for impact traces limits their approach. However, in recent years we have observed more innovative methodologies, which shift the focus from the scientific paper to the researcher. This is the perspective used by Milanés-Guisado & Torres-Salinas (2014). They analyze the number of mentions of papers published by a sample of researchers in social media. They also explore the visibility these researchers have in these networks. By establishing the researcher as their unit of analysis, they can explore aspects related indirectly with research closer to social impact. As the approach is based on the subject and not on the output, we can develop an escalating methodology without establishing aggregation levels, in which the role of the analyzed subject can vary depending on their scale.

The perspective and goals of a researcher who uses social media to reach non-academic audiences differ from the perspectives and goals of an institution or research center. This approach is appropriate when analyzing digital centers which are embedded in the Internet. Social media offer further advantages. They allow us to identify the audiences a researcher or a medialab reaches in real time, giving the manager the opportunity to analyze the potential of the center to reach its target audience.

This perspective is based on the conceptual framework presented by Nederhof (2006). He conceptualizes the limitations on the use of bibliometric indicators in Social Sciences and Humanities as a question of audiences. Robinson-Garcia, van Leeuwen & Rafols (2016) also mention this. They suggest the use of social networks as a proxy to identify interactions among social sciences and humanities researchers in a local context. Nederhof (2006) establishes three types of audiences these researchers usually address:

- Global scientific community: characterized by very standardized communication patterns.
- Local experts: formed by professionals and academia who work with the local community.
- Non-academic public: a very heterogeneous group.

We suggest a strategic evaluation model that does not determine impact in a vertical and unidimensional way, but a model able to characterize the different types of audiences. This way, it is easier to make strategic decisions when analyzing if the medialab is reaching its goals. Medialab needs indicators that offer an important level of immediacy.

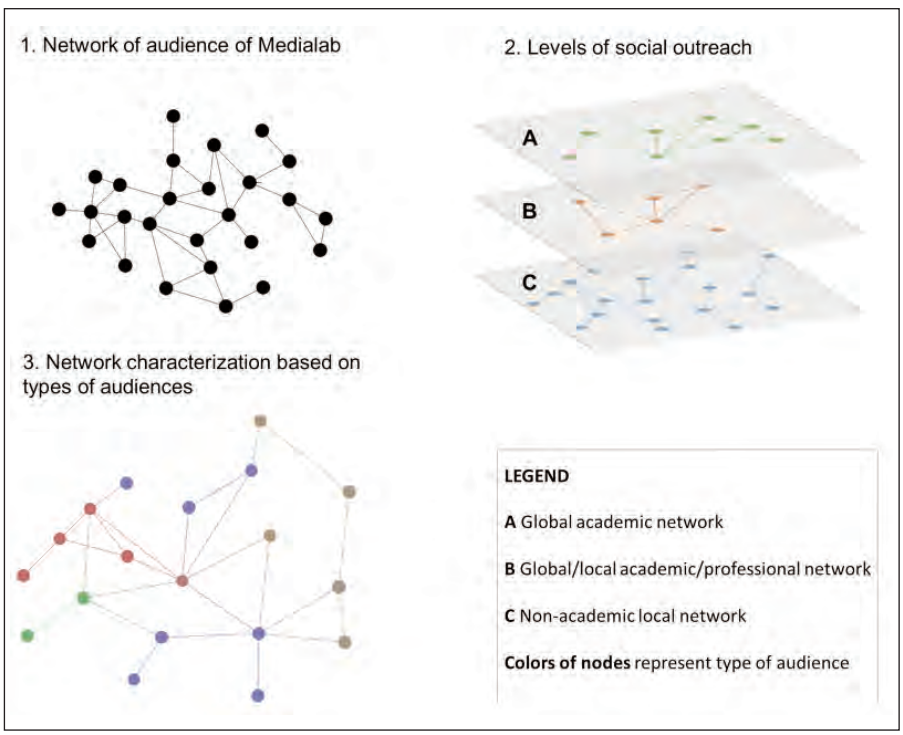


Figure 1. Identification model for audiences through Twitter.

Figure 1 summarizes the type of analysis we suggest. We consider using Twitter as an observational tool. This platform is characterized by its capacity both to identify offline communities and create online communities. At the same time, it serves as a social and cognitive space where the professional and private interests are intertwined. The type of relations established and the type of users is very heterogeneous. An account can be an institution, a person, an anonymous collective, or even a fictional character. The relations among users can be established through mentions, retweets, or the followers and followed.

Due to the volatility of the networks based on mentions and retweets, we define the population of interest as the population formed by users who follow and are followed by the analyzed center. We consider that the existing bidirectional relationship between the net and the medialab show a mutual interest in the activities performed by each other (Gruzd, Wellman, & Takhteyev, 2011). Once the population of interest is identified, we search for the same type of relationships between every subject, their type of audience and their geographical proximity to the unit of analysis. We can easily identify whether they reach the target audiences through a descriptive analysis of the different audiences. In section 4, we offer an example of the aforementioned model applied to Medialab UGR.

4. The case of Medialab UGR

In 2015, Medialab UGR – Laboratory for the Research of Culture and Digital Society (https://goo.gl/f2ASE2) was created at the University of Granada. It is a laboratory that, according to its website, is defined as "a meeting place for the analysis, research, and dissemination of the possibilities that digital technologies create in the culture and the society in general". It develops its activities in different University spaces around the city, as well as in other places that do not belong to the institution. This distribution reflects in the physical distribution the networked structure that characterizes its activity in the Internet.

The management of the laboratory is flexible. For instance, it broadcasts in streams all the activities it organizes. It bases its activity on the following values: openness, active citizens, creativity, experimentation, flexibility, social innovation, knowledge transfer (University –society and society– University), entrepreneur attitude, and activism in favor of open knowledge and open Internet.

It is focused on three main themes: Digital Society, Digital Humanities, and Digital Science. Below are some of the innovations this university proposal has introduced in the University of Granada:

• Launch of a project about digital identities (https://goo.gl/mNOCmv). Its aim is to detect and recognize the value of the communication that different individuals and groups in the University engage in on the Internet. This initiative is connected to a Communication and Innovation Award in Digital Media. The purpose of this is to promote Digital Scholarship (Weller, 2011) within the University and in the new types of knowledge that appear in the digital society.

• Creation of the Platform Livemetrics (https://goo.gl/tWQwR6) for the visualization of bibliometric information in real time.

• Organization of several conferences and meetings open to the presentation of projects by the university community and the public with issues such as Open Education, Makers, eDemocracy, or Open Innovation.

The project was created at institutional level in 2015, but its origin is based on a non-institutional initiative named GrinUGR – Colaboration about digital cultures in Social Sciences and Humanities (https://goo.gl/sy9pnd). The institutionalization of these practices is just one of the values of the case we present.

4.1. A quantified approach to the impact of a university medialab: an analysis of the audience through Twitter.

Medialab UGR develops its activity both digitally and physically, leaving a significant footprint of its action. Good evidence of this is its birth: it was announced on Twitter before its official opening (https://goo.gl/wxXMMN). From that moment on, Twitter has been a key tool within its dissemination strategy.

In May 2016, we performed an initial analysis to identify the type of audiences Medialab has reached, and learn to what extent it had become a link between the university and society. In that moment, Medialab UGR had already organized a total of 13 activities (four workshops, six sessions, a conference, and two round tables). The aim was to establish different types of audience and their geographic proximity. In May 2016, we downloaded the data from Twitter using Simply Measured. At that moment, Medialab UGR had 930 followers and was following 614 accounts. While the number of followers reflects the population interested in Medialab UGR, it is highly presumptuous to consider that this population participated actively in its activities. On the other hand, followed accounts can

exercise influence on the activities of the Medialab, but they may well be accounts the lab is interested in following for strategic reasons or institutional recognition.

Therefore, we consider that, when a bidirectional relationship is established between two accounts, we can confirm that there is a common interest. The idea is based on the notion of conceiving the unit of analysis as a node inside a larger network, where people/institutions are grouped into communities. We identified a total of 351 accounts that showed the mentioned bidirectional relationship. This group is defined as population of interest´. In Table 1, we show the segmentation of this population according to its geographical proximity and the type of identified accounts.

Table 1. Description of the population of interest of Medialab UGR according to their type of account and their geographical proximity to Granada

Profiles		Geographic proximity	# users	Average of followers	Typical deviation followers
Non-academic population		Total	130	3898.6	9086.9
	Events	Total	1	2497.0	0.0
		Local	1	2497.0	0.0
	Persons	Total	84	3572.0	8550.8
		Global	36	2239.7	3197.9
		Local	46	4661.7	11142.5
		Unknown	2	2491.5	1720.4
	Institutions	Total	44	3426.9	6992.8
		Global	28	4504.1	8515.3
		Local	16	1541.8	1924.5
	Unknown	Total	1	53493.0	0.0
		Global	1	53493.0	0.0
Researchers	Total	Total	191	2260.3	8311.9
	Events	Total	1	313.0	0.0
		Local	1	313.0	0.0
	Persons	Total	131	1711.3	4179.8
		Global	34	3582.4	6883.3
		Local	97	1055.5	2386.8
	Institutions	Total	59	3512.4	13594.9
		Global	10	1756.4	1988.6
		Local	49	3870.8	14893.3
Unknown	Total	Total	30	2012.8	7534.0
	Persons	Total	18	3069.1	9672.6
		Global	3	14521.0	23411.0
		Local	4	2037.0	2029.5
		Unknown	11	321.1	349.6
	Institutions	Total	2	1560.5	1393.7
		Global	1	575.0	0.0
		Local	1	2546.0	0.0
	Unknown	Total	10	202.1	200.5
		Local	1	226.0	0.0
		Unknown	9	199.4	212.5
		Total	351	2846.0	8561.5

In terms of geographic outreach, Medialab UGR has not only involved researchers (38.2%) and students (9.4%), but also 37% of the audience who belong to non-academic sectors. 61.5% of the profiles are local, highlighting their integration within their social context. This percentage goes down to 48.5% if we only focus on the non-academic audience. Profiles do not belong only to individuals, but also to institutions, associations, and collectives (30%). The higher presence of institutional accounts is formed by faculties, departments, and other university organisations (30), although we can find some public organisations too. Paradoxically, none of these accounts belong to any organisations related to the local council.

Figure 2 shows the type of audience according to their interests, based on the information provided by Twitter and a manual search of their background. We observe that the main non-academic and local audience is formed by teachers (28), students (29) and the cultural sector (11). Global audiences are represented by the cultural sector (18), teachers (16), journalists (12) and new technologies (17).

The graphic presented is purely descriptive since it intends to serve as an information tool for decision making and not to establish comparisons between different units. We observe how, despite doing the analysis at an early stage in the consolidation of the medialab, there are positive trends in its efforts to connect with diverse non-academic audiences both at local and global levels. This type of analysis offers a different perspective to previous studies focused on altmetrics since we move from an evaluative perspective to a strategic perspective that facilitates decision making.

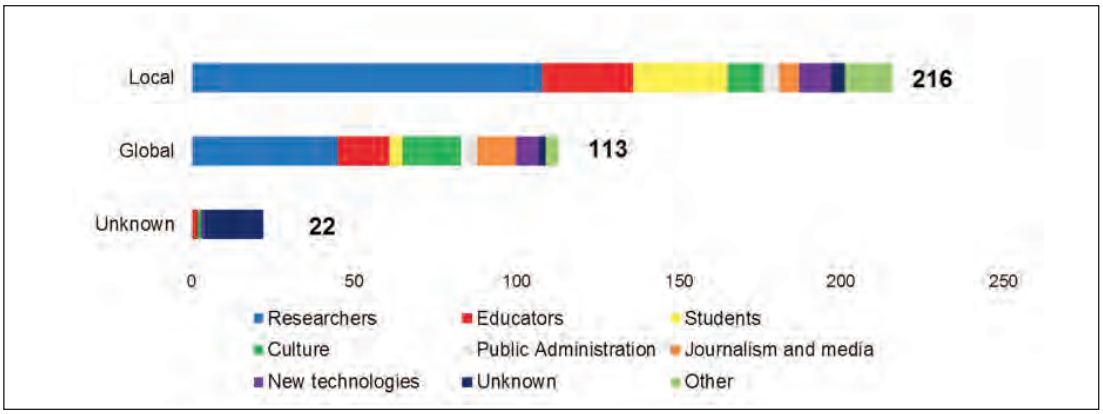


Figure 2. Description of the population of interest in Medialab UGR according to the type of account and their geographical proximity to Granada.

5. Discussion and conclusions

In relation to the first aim, this paper introduces medialabs as a means of innovation in the university context. They are born in the heart of the digital culture and they come to life in formats and epistemologies that shift away from that perspective. We have established a connection between the concepts of social laboratories and media-labs.

According to the second goal, we have established how the open, social, and digital nature of these laboratories requires the creation of new metrics of social involvement that goes beyond the traditional assessment models. Since the problem extends to the university in general, this type of laboratories offer opportunities to design and test new methods that can be extended to more holistic and multidimensional evaluations on the impact of the universities.

In this context, the the need to have the right tools to monitor the reception of its activities is essential. In this paper, we suggest the analysis of the different audiences targeted through social networks as a methodological approach for the future development of impact indicators. A first implementation based on Medialab UGR shows promise in its potential use for decision making. However, there are still some limitations, both technical and conceptual, which must be analyzed subsequently. In this sense, the meaning of "following" someone on Twitter is difficult to discern, as is its capacity to predict how its results translate into citizen participation. We suggest further research using this methodology in different medialabs in order to analyze its consistency and potential for the development of benchmarking indicators.

References

Alcalá, J.R., & Maisons, S. (2004). E*studio/Propuesta para la creación de un Centro de Excelencia en Arte y Nuevas Tecnologías*. Madrid: Fundación Telefónica.

Arnkil, R., Järvensivu, A., Koski, P., & Piirainen, T. (2010). *Exploring Quadruple Helix. Report of Quadruple Helix Research for the CLIQ Project*. Tampere: Work Research Centre, University of Tampere.

Cabezas-Clavijo, Á., Torres-Salinas, D., & Delgado López-Cózar, E. (2009). Ciencia 2.0: Catálogo de herramientas e implicaciones para la actividad investigadora. *El Profesional de la Información*, *18*(1), 72-79. https://doi.org/10.3145/epi.2009.ene.10

Casebourne, J., & Armstrong, K. (eds.) (2014). *Digital Social Innovation. Second Interim Study Report.* (https://goo.gl/FK0S8Q) (23-12-2016).

Dewey, J. (2009). *Democracia y escuela*. Madrid: Popular.

Estalella, A., Rocha, J., & Lafuente, A. (2013). Laboratorios de procomún: experimentación, recursividad y activismo. *Teknokultura*, *10*(1), 21-48.

European Commission (2013). *Guide to Social Innovation.* (https://goo.gl/W9moUD) (2016-12-23).

European Union / The Young Foundation (2010). *Study on Social Innovation.* (https://goo.gl/dfY1gA) (2016-12-23).

García, M. (2015). *Medialab-Prado: retos del presente. LabMeeting 2015 en Medialab Prado* (Madrid). https://goo.gl/CjexQB (23-12-2016).

Grijalba, N., & Toledano, F. (2014). Nebrija MediaLab: un valor añadido a la docencia y al desarrollo de competencias. *Historia y Comunicación Social*, *19*, 733-744. https:/doi.org/10.5209/rev_HICS.2014.v19.45061

Gruzd, A., Wellman, B., & Takhteyev, Y. (2011). Imagining Twitter as an Imagined Community. *American Behavioral Scientist*, *55*(10), 1294-1318. https://doi.org/10.1177/0002764211409378

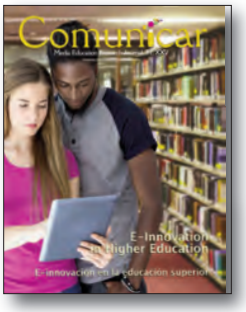
Hassan, Z. (2014). *The Social Labs Revolution: A New Approach to Solving our Most Complex Challenges*. San Francisco: Berrett-Koehler Publishers.

Himanen, P. (2003). *La ética del hacker y el espíritu de la era de la información*. Barcelona: Destino.

Kieboom, M. (2014). *Lab Matters: Challenging the Practice of Social Innovation Laboratories.* Amsterdam: Kennisland.

Kusch, M. (2011). Social Epistemology. In S. Bernecker, & D. Pritchard (Eds.), *The Routledge Companion to Epistemology* (pp.874-884). London / New York: Routledge.
Magro, C., & García, M. (2012). Lugares de la transdisciplinariedad. Lugares para la transdisciplinariedad. Errata. R*evista de Artes Visuales, 8*. (https://goo.gl/2CzDEQ) (2016-12-26).
Milanés-Guisado, Y., & Torres-Salinas, D. (2014). Presencia en redes sociales y altmétricas de los principales autores de la revista «El Profesional de la Información». *El Profesional de la Información*, *23*(4), 367-372. https://doi.org/10.3145/epi.2014.jul.04
Nederhof, T. (2006). Bibliometric Monitoring of Research Performance in the Social Sciences and Humanities: A Review. *Scientometrics, 66*(1), 81-100. https://doi.org/10.1007/s11192-006-0007-2
Phillips, W.C. (1940). *Adventuring for Democracy.* New York: Social Unit Press.
Phills, J.A., Deiglmeier, K., & Miller, D.T. (2008). Rediscovering Social Innovation. *Social Innovation Review.* (https://goo.gl/i1sbvO) (2016-12-23).
Priem, J. (2013). Scholarship: Beyond the Paper. *Nature*, *495*, 437-440. https://doi.org/10.1038/495437a
Priem, J., & Hemminger, B. H. (2010). Scientometrics 2.0: New Metrics of Scholarly Impact on the Social Web. *First Monday, 15*(7). (https://goo.gl/ODM1tz) (2016-12-23).
Robinson-Garcia, N., Van-Leeuwen, T.N., & Rafols, I. (2016). SSH & the City. A Network Approach for Tracing the Societal Contribution of the Social Sciences and Humanities for Local Development. *Science and Technology Conference 2016*. Peripheries, Frontiers and Beyond, 14-16 September. (https://goo.gl/bgl3jU) (2016-12-23).
Romero-Frías, E. (2013). Ciencias Sociales y Humanidades Digitales: una visión introductoria. In E. Romero-Frías, & M. Sánchez-González (Eds.) (2014). Ciencias Sociales y Humanidades Digitales. Técnicas, herramientas y experiencias de e-Research e investigación en colaboración. *Cuadernos Artesanos de Comunicación*, *61*. (https://goo.gl/CDzAL9) (2016-12-23).
Ruiz-Martín, J.M., & Alcalá Mellado, J.R. (2016). Los cuatro ejes de la cultura participativa actual. De las plataformas virtuales al medialab. *Icono 14*(14), 95-122. https://doi.org/10.7195/ri14.v14i1.904
Salaverría, R. (2015). Los labs como fórmula de innovación en los medios. *El Profesional de la Información*, *24*(4), 397-404. https://doi.org/10.3145/epi.2015.jul.06
Scolari, C.A. (2008). Hipermediaciones. *Elementos para una teoría de la comunicación digital interactiva*. Barcelona: Gedisa.
Socientize Consortium (2013). *The Green Paper on Citizen Science*. Brusels: European Commission. (https://goo.gl/7P3FYf) (2016-12-23).
Sugimoto, C.R., & Larivière, V. (2016). Social Media Metrics as Indicators of Broader Impact. *OECD Blue Sky III Forum on Science and Innovation Indicators*. Gent (Belgium), September, 19-21.
Surowiecki, J. (2005). *The Wisdom of Crowds.* New York: Anchor.
Tanaka, A. (2011). Situating within Society: Blueprints and Strategies for Media Labs. In A. Tanaka & al. (2011), *A Blueprint for a Lab of the Future* (pp. 12-20). Eindhoven: Baltan Laboratories.
Torres-Salinas, D., Cabezas-Clavijo, A., & Jiménez-Contreras, E. (2013). Altmetrics: New Indicators for Scientific Communication in Web 2.0. [Altmetrics: nuevos indicadores para la comunicación científica en la Web 2.0]. *Comunicar, 41*(XXI), 53-60. https://doi.org/10.3916/C41-2013-05
Weller, M. (2011). T*he Digital Scholar. How Technology is Transforming Scholarly Practice*. London: Bloomsbury.
Wilsdon, J., & al. (2015). *The Metric Tide: Report of the Independent Review of the Role of Metrics in Research Assessment and Management*. https://doi.org/10.13140/RG.2.1.4929.1363

Comunicar, n. 51, v. XXV, 2017 | Media Education Research Journal | ISSN: 1134-3478; e-ISSN: 1988-3293
www.comunicarjournal.com



Higher Education Distance Learning and e-Learning in Prisons in Portugal

La educación superior a distancia y el e-Learning en las prisiones en Portugal

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ABSTRACT

Higher Education in Europe has undergone massive changes due to technological advancements and adjustments resulting from the Bologna Process, by which learning should be accessible for all regardless of social exclusion reasons, such as imprisonment. The resulting massification of access to Higher Education requires flexible and inclusive training provision focused on the student. These are the primary aims of Distance Learning at the Open University of Portugal. The aim of this paper is to understand the viewpoints of twenty-six respondents (students, applicants to courses and senior rehabilitation technicians) on the reality of Higher Education in Distance Learning and e-Learning in a Portuguese prison. This study occurs in a context of a non-positivist paradigm, placing the emphasis on the perception of individuals through a qualitative methodology. The results obtained from interviews show that the education process has many weaknesses and limitations mostly due to the lack of facilities, educational and technological resources, and support from teachers. The conclusion is that it is essential to provide better conditions for prisoners receiving this type of education, as it can be an opportunity for obtaining professional qualification and for personal development, thus increasing their prospects of success in the future.

RESUMEN

La enseñanza superior en Europa ha venido experimentando grandes transformaciones gracias a los avances tecnológicos y a los cambios derivados del proceso de Bolonia, que prevé la creación de condiciones para que todos tengan acceso al aprendizaje, independientemente de factores de exclusión social, como la reclusión. La subsiguiente masificación del acceso a la Enseñanza Superior exige una oferta educativa flexible, centrada en el estudiante e inclusiva: son estas las prioridades de la Educación a Distancia de la Universidad Abierta en Portugal. Este artículo tiene como objetivo conocer las impresiones de veintiséis individuos (estudiantes, candidatos a estudiantes y técnicos superiores de reeducación) sobre la realidad de la Enseñanza Superior en la modalidad de Educación a Distancia y aprendizaje virtual (e-Learning) en una cárcel portuguesa. Este estudio se encuadra en un paradigma no positivista y hace hincapié en la percepción de los individuos, recurriendo a una metodología de carácter cualitativo. Los resultados, obtenidos mediante entrevistas, revelan la existencia de enormes debilidades y limitaciones en el proceso educativo, debido, sobre todo, a la falta de instalaciones y medios, recursos pedagógicos y tecnológicos, y apoyo de los profesores. Se ha concluido que es fundamental crear mejores condiciones de asistencia a distancia en las cárceles, porque esta formación superior puede ser una oportunidad de cualificación profesional y desarrollo personal, que incrementa sus perspectivas de éxito en el futuro.

KEYWORDS | PALABRAS CLAVE

Distance education, e-learning, higher education, lifelong learning, prisons, teaching and learning, digital inclusion, innovation.
Educación a distancia, e-learning, enseñanza superior, formación continua, centros penitenciarios, enseñanza y aprendizaje, inclusión digital, innovación.

Received: 2016-09-30 | Reviewed: 2016-11-13 | Accepted: 2016-12-05 | Preprint: 2017-02-15 | Published: 2017-04-01
DOI: https://doi.org/10.3916/C51-2017-04 | Pages: 39-49

1. Introduction

As a result of globalization, society today is characterized by rapid and significant changes, leading to the ability to innovate and define strategies, and to transformations that can be applied in practice, affecting all social, cultural, educational, political and economic areas, and changing our way of thinking, interacting, acting and communicating. Some of the most important factors driving these changes are information and communication technologies (ITC), as they can influence varied and significant aspects of social life that have a tremendous impact on social relations, knowledge and production of goods; the way work is produced and organized, by introducing smart methods in the stages of the production process; and also influence cross-border political democracy to enable citizen participation.

The growth of ICTs has led us to a digital society, to knowledge and networks that significantly change how we are positioned and live in society through cyber culture, which Lemos and Cunha (2003: 12) referred to as "the sociocultural pattern that emerges from the symbiotic relationship between society, culture and new technologies".

In the field of education, new ideas have appeared in order to meet the specific training needs of individuals based on the possibility of building knowledge in various ways, so as to maximize the construction and development of the educational process. This process has become much more interactive, richer and diversified, based on flows of communication supported by digital technologies. Currently, content and learning management platforms and e-Learning are important tools available to students and teachers, because they allow information to be quickly disseminated and updated, enabling the setting up of virtual learning communities, favoring individual or group communication, facilitating a more flexible access to educational materials, and supporting self-learning so that the individual can become the focal point of his or her own knowledge. Platform-mediated teaching through e-Learning has, indeed, been recognized in the last decade as an appropriate method and resource to address the challenges that the globalized world faces in terms of lifelong learning and the development of technological and social skills (Sangrà, Vlachopoulos, & Cabrera, 2012; Herrington, Reeves, & Oliver, 2010).

Given that the standards of education and training in prisons should be the same as those in normal educational institutions, DL and e-Learning can be an opportunity for individuals serving a sentence not only to develop skills and professional know-how, but also to acquire digital skills, thus improving their ICT qualifications.

In fact, e-Learning in prisons has recently been widely studied in Europe (Hammerschick, 2010; Turley & Webster, 2010). Its relevance is evident in recent EU funded projects, for e.g., "European re-Settlement Training & Education for Prisoners", "Blended Learning in Prison, a German Approach for Using LMS in Prison", "E-learning in Prison – the Norwegian IFI System" (E-Step, 2008; E-Learning Platforms and Distance Learning, 2010).

In Portugal, although Law 115/2009, of 12 October, and its latest update (Law 21/2013, of 21 February) emphasizes that prisoners should attend higher education courses, "(...) in particular through distance learning" (Article 38), there seems to be strong signs that Distance Learning (DL) and e-Learning in Portugal are not yet structured effectively and efficiently.

This shows how timely and relevant our study is and explains how important it is to learn more about DL and e-Learning as a strategy for qualification in a prison context.

The purpose of this study is, therefore, to understand the views of students and applicants in prisons and of senior rehabilitation technicians on the reality of HE in terms of DL and e-Learning in a Portuguese prison in Porto (EPP), e.g. in terms of facilities and equipment, educational and technological resources, and support from teachers.

1.1. The European Framework for Higher Education in the Bologna Process and the Role of ICTs

Globalization and technological advancements in the Information Society have obviously had an impact on Higher Education at macro level (national and international political discourses), meso level (organization of institutions) and micro level (classroom context), all of which are influential and interdependent. This is good enough reason for framing the use of e-Learning within Higher Education in a particular context, for e.g., in prisons, and for referring to the European Framework for Higher Education in the Bologna Process and the role of ICTs in this type of education.

The Bologna Process, begun in 1999 with the signing of the Bologna Declaration, made European higher education institutions undergo a series of changes at all levels, from the organization of study plans to educational issues, with the purpose of creating a cohesive, competitive and attractive European of Higher Education Area (EHEA). In terms of organization, three education cycles were adopted and the European Credit Transfer and Accumulation System (ECTS) was introduced, giving flexibility to course curricula which are is divided into credit units based not only on teaching hours, but also on the student's time and effort in attending and successfully completing them

(European Commission, 1999). From the pedagogical point of view, the changes in higher education arising from the Bologna Process concern the transition from centralized transmission teaching to valuing the learning process and development of skills.

In Portugal, these changes became official through Law 49/2005, of 30 August, which amended the Basic Law on the Education System, and through Decree-Law 74, of 2006, which relates solely to higher education and emphasizes the issue of paradigm shift:

"A central issue in the Bologna Process is the paradigm shift from a passive teaching model, based on the acquisition of knowledge, to a model based on the development of skills, which includes general skills –instrumental, interpersonal and systematic– and specific skills associated with training, where the experimental and project components play an important role".

This context of change driven by globalization, technological advancements and, in part, by the Bologna Process forced some institutions to modernize the teaching-learning process, following which many chose to use or increase the use of a Learning Management System (LMS platforms), such as WebCT, Moodle, Blackboard, etc., to complement face-to-face classes, boosting an educational reform of the learning process.

> The prison context is very specific, closed within itself, and has unique rules. It is also important to stress and, above all, believe that it can make a difference to the education and training of prisoners. By introducing adapted and attractive technological and educational resources that can support and motivate these students, we can create opportunities for the development of skills aimed at their integration.

1.2. Distance Education and e-Learning as an education means in a prison context

e-Learning is used by 96% of European higher education institutions to provide a more effective use of classroom time and more flexible teaching-learning processes (Gaebel & al., 2014: 72). These authors argue that e-Learning is threefold: technological, intellectual and social, all of which can contribute to the desired European higher education convergence under the Bologna process: "Theoretically, integrating e-learning within the ongoing development of the European Higher Education Area could underpin the Bologna Process goals of convergence in higher education, more fruitful exchanges and collaboration between institutions, and an enhanced global dimension, with Europe more visible in, and interactive with, the world at large".

In this respect, Herrington, Reeves and Oliver (2010) state that online technology essentially applies to the increase in opportunities to access higher education, increased retention rates, and increased learning quality and result outcomes. Bonk and Graham (2006), in turn, highlight three main reasons for using e-Learning: i) pedagogical upgrading; ii) increase access and flexibility; iii) cost-effectiveness ratio.

Monteiro, Leite and Lima (2013) identified the following benefits of e-Learning in higher education: its potential to make different support material available; interaction possibilities; response to the challenges posed by the globalized world; flexibility; reduction in travel costs and environmental impact.

In reference to this Collis and Moonen (2011: 21) state that "Institutions had to make heavy investments in technology and explore strategies for change in their methods of operations in order to increase flexibility of participation". To make the best use of ICTs for educational purposes, and at the same time to diversify training provision, develop skills in digital literacy and contribute to the professional and academic training of individuals in social exclusion, e-Learning projects have been developed in prisons throughout Europe. Some of them were funded by European Lifelong Learning programs in subprograms such as Grundtvig (adult education) and Leonardo da Vinci (vocational education), for e.g., PIPELINE (Norway, Czech Republic, Denmark, Germany, Romania, Slovenia, Sweden, United Kingdom) in 2005, and LICOS (Germany, Norway, Austria, Spain, the Netherlands and Hungary) in 2008. Others projects are in a more final form, such as Elis (Germany and Austria), the Virtual Campus (United Kingdom) and "Internet for inmates" (Norway). Lockit (2011) identified the potential and barriers of e-

Learning in prison, based on the results of a study carried out in European prisons (Figure 1).

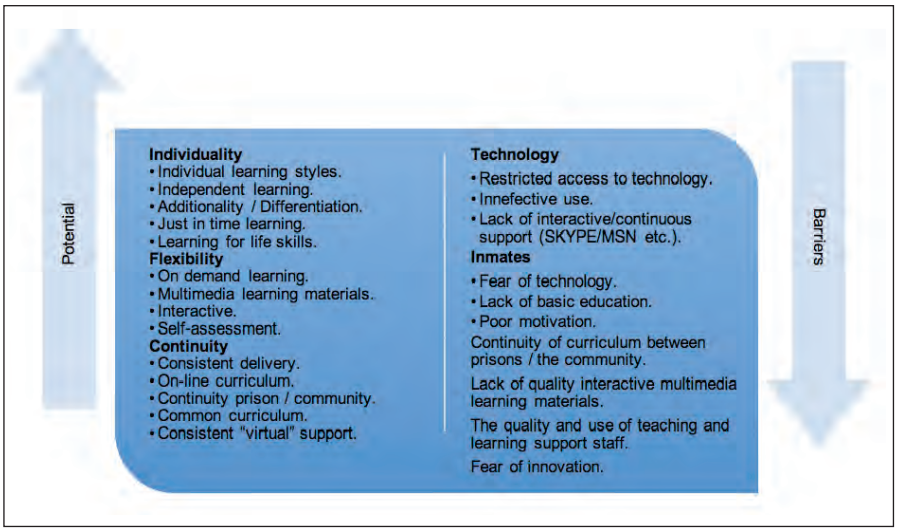

Figure 1. Potential and barriers of e-Learning in prisons (based on Lockitt, 2011).

In Portugal, two e-Learning projects in prisons are under way: the "EPRIS" project (Barros & Monteiro, 2015) and "Educação a Distância e e-Learning em Estabelecimentos Prisionais em Portugal. Desenvolvimento e Avaliação de um Modelo Pedagógico Inclusivo" (Moreira & al., 2016) [Distance Learning and e-Learning in Prisons in Portugal. Development and Assessment of an Inclusive Educational Model], under which this study was prepared.

2. Method

The study aims at understanding the views of individuals on the current state of distance learning in prisons. Because of the nature of this subject, it was important to conduct a qualitative study in which direct speech is used in an interpretative approach in order to contextualize and explain the views of respondents, aiming to give account of how prisoners and technicians assess and understand the reality of Higher Education (HE) in DL and e-Learning inside a prison in Portugal.

To obtain data for the study, semi-structured interviews were conducted. To analyse the data therefrom, a research technique was used to decode the semi-free and apparently mixed statements: content analysis (Bardin, 1977; Vala, 1986). Table 1 presents the objectives, categories and questions that the interviewees were asked.

2.1. Participants

The sample consisted of a group of eleven male HE applicants, nine male prisoners in Porto Prison (EPP) representing all the students attending undergraduate degrees in the form of DL and e-Learning, at the Open University and six Senior Rehabilitation Technicians (TSR), working at the EPP assisting the prisoners along their career path and improving their personal and working skills. All the Open University´s inmate students and can-

Table 1. Objectives, categories and interview's questions

Objectives	Categories	Questions
To identify the perceptions about Distance Education and e-Learning	Definition of Distance Learning and e-Learning	In your opinion what is Distance Learning and e-Learning?
	Conceptualisation of a Higher Education Course in Distance Learning and e-Learning	How do you envisage a course in this modality?
	Benefits of Distance Learning and e-Learning	Are there benefits of taking a distance education course?
	Integration of Digital Technologies in Higher Education in a Prison Context	In your opinion, how should digital technologies be integrated to promote significant learning according to your needs?
To identify the difficulties and conditions for the development of the educational process inside prison	Facilities and equipment	Is there a place/room suitable for studying in this prison? What about a library?
		Is there a computer room? What kind of access does this room have?
		Does the establishment provide educational supplies? What kind?
	Resources	What kind of pedagogical resources are available? Who provides them?
		Do you have access to relevant bibliography for your learning?

didates were interviewed. This particular prison was chosen because it has the largest prison population taking distance higher education learning in Portugal. Tables 2 and 3 present the characteristics of candidates, students and TSR according to variables that give us a clear picture of the respondents' profile.

Table 2. Participants

	Ages	Detention time	Detention regime	Course	Education level	Training inside prison
HE applicants (CF 01…CF 11)	From 23 to 60 years old	From 5 months to 4 years	Close (10) Open (1)	Management (3) Social Science (7) Informatics (1)	From 6th to 12th year	Completion of the 12th year (5)
Students/inmates (ES01 … ES09)	From 31 to 47 years old	From 2 years to 6 years	Close (7) Open (2)	Management (5) Social Science (4)	From 10th to 12th year	ICT (2) Completion of the 12th year (1) Portuguese for foreigners (1) Gardening (1)

Table 3. Characterization of Re-education senior technicians from EPP

ID	Gender	Employment period	Education level
TR01… TR06	Male (1) Female (5)	From 10 years to 31 years	PhD (1) Master Degree (1) Higher education (4)

2.2. Procedure

The logics of the analysis of data collected from interviews was based on two alternating phases: a vertical analysis was made of each interview; a horizontal or comparative analysis was made using the "constant comparative analysis" method (Miles & Huberman, 1994) to identify common and different aspects of the representations and perceptions of respondents. These data are also shown in Tables to explain the relevance of some of their opinions. Choosing this information organizational model will allow us to study the respondents' views in a systematic and analytical way and will give us a more adequate view of their overall ideas. Finally, it is important to stress that due to the assessment method used, some of the records, codified with the acronym UR, were marked with the expressions Positive Trend (+), Negative Trend (–) and Hesitation/Undefined (+/–). The acronyms CF, ES and TR refer to Applicants to Courses, Students, and Senior Rehabilitation Technicians, respectively.

3. Results

3.1. Perceptions about distance education and e-Learning

To learn about the respondents' views on the reality of distance HE at the EPP, we need to know their views on this type of teaching and how they conceptualised a DL and e-Learning course in a prison context. Without this "diagnosis", the wrong conclusions can be drawn about the meaning and notion of DL and e-Learning.

The first category, Definition of DL and e-Learning, with twenty items, contains the respondents' records on what they understand by DL and e-Learning (Figure 2).

By reading the results, respondents and students define DL and e-Learning as a teaching-learning process assisted by technological means, where the teacher and students are separated physically, in geographical terms and even in different time zones. In this respect, student ES06 realizes that e-Learning at the EPP is not the same as outside prison.

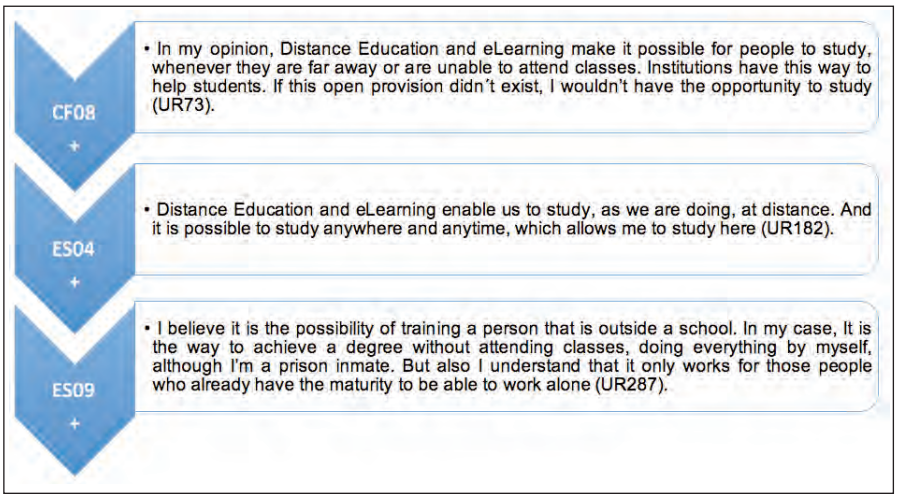

Figure 2. Definition of e-Learning and Distance Education.

- ES06: e-Learning inside prison is not the same as outside, because when I go home I have access to the platform and it's all very different!

Basically, it is a learning method for those who cannot attend regular classes but want to acquire knowledge in a particular area, managing their own time and study (RU 264).

The concept of DL and e-Learning has been discussed in great depth in order to identify the characteristics that distinguish it from other forms of teaching. This need to define the concept seems to be associated with the fact that this form of teaching is strongly under development and is taking root in our society, constantly characterized by the new information and communication technologies. This concept is part of a new educational ecology that has contributed greatly to the reconceptualization of teaching and learning (Garrison & Anderson, 2003). Because it is a recent concept, the basis and purposes of its application in educational contexts are still diverse, unstable and diffuse. While for some authors the concept is scaled down to the technological size of tools that mediate the learning process, for others it only covers the contents available online. In this respect, Sangrà, Vlachopoulos and Cabrera (2012) propose a comprehensive and inclusive definition of DL and e-Learning, stating that, today, this form of teaching and learning can represent all or part of the educational model in which the electronic resources and devices are used to facilitate the access, evolution and improvement in the quality of education and training, which is in line with the definitions given by Masie (2006) and Rosenberg (2001), mentioned before.

As regards the category called Conceptualisation of a Higher Education Course in DL and e-Learning in A Prison Context, with twenty-seven items, the answers of both student and staff respondents' show that there is a tendency to point to the existing difficulties and obstacles they have faced, saying that if the course is to be adapted to the reality of the knowledge society, it cannot be limited to just reading the recommended literature. It needs to be supported by information and communication technologies, by learning platforms, by access to the Internet, computer resources, which this prison does not have. In fact, students and technicians clearly refer to the need for an Internet connection and technological resources, such as content management platforms, and better support from teachers. In this respect, they mention:

• ES04: Being able to put my questions to the teacher, there is an exchange between students ... when I go outside on probation, I have access to the platform. That's why I am aware that we need it inside. Through the platform I know objectively what we have to study (...) and we have guidance. Ideally, we would have access to the platform and to all its contents. Either that or the university could send us a CD with those subjects so we would know what to study (RU 183).

• ES06: Being able to do video conferencing to ask questions, but it can be expensive... all prisons should have access to it. Having intranet, for example, if we cannot have the Internet (...) always have access to digital materials and to teacher tutoring (RU 226).

• TR06: If we have more contacts with the University and teaching, it could be just like for other students out there. We would obviously need an Internet connection (...) which would imply something controlled, to be used only for University purposes... (RU 410).

Digital technologies are nowadays an unquestionable vehicle of information and of access to knowledge, as stated by Herrington, Reeves and Oliver (2010). There is more and better hardware and software, leaving us a click away from anywhere in the world. It is, therefore, clear that "interactive technologies, most of all, have shown, in DL and e-Learning, what should be at the core of any educational process: the interaction and dialogue between all those involved in this process" (Moran, 2013).

e-Learning –network learning– appears as the fourth generation of DL and, in this form of teaching, written materials are replaced by multimedia digital materials. In e-Learning, learning stages are pre-programmed and divided into topics, using various resources such as e-mail, texts and scanned images, chats, forums, links, videos, among others.

Online education therefore facilitates the introduction of new learning opportunities that challenge students and "enable a form of learning that falls within constructivist paradigms and is different from other forms of distance learning" (Morgado, 2001).

In respect of DL and e-Learning, we are now experiencing a transition and evolution phase, as the teaching models directed only to the individual are being expanded to the group (to the collective), thus enabling the exchange of knowledge and experiences, promoting discussions and allowing positive results to be achieved for everyone. In a situation as specific as that of these students, it seemed to be crucial and urgent, as stressed by the TSRs, to provide safe access to content or learning management platforms, interactive or otherwise, to allow students to be closer to this fourth generation of DL.

As for the category Benefits of DL and e-Learning, with twenty-six items, the classification of records shows that

most respondents considered that there are many benefits to attending a course in this form of education (Figure 3).

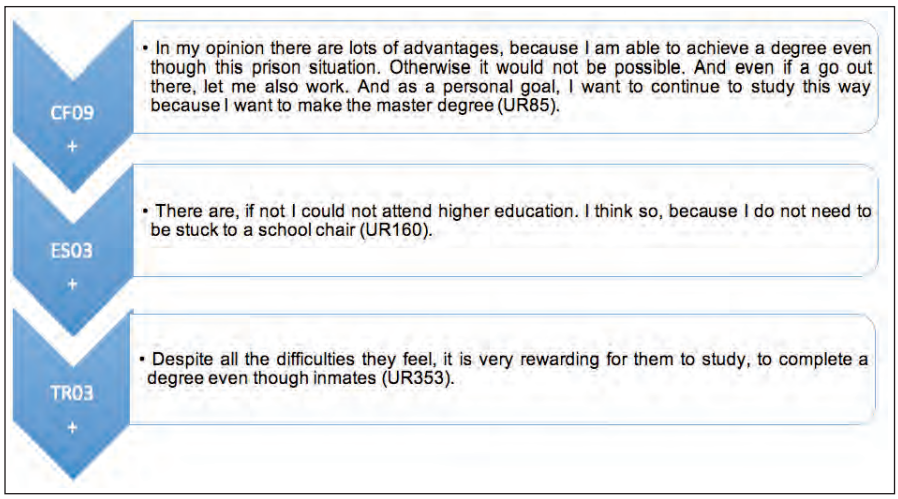

Figure 3. Advantages of distance education and e-Learning in a prison context.

The students' opinions show that the benefits are obvious, as there is no other way of attending an undergraduate degree at the EPP, and that this is a way of continuing studies at another prison or after being released, anywhere in the world. These findings reinforce the benefits identified by Monteiro, Leite and Lima (2013) who highlighted as main benefits flexibility in access to learning, time saving, a more personalized learning, control and evolution of learning at the student's own pace, universal access to various resources, and the increase in social equity and pluralism in access to education and sources of knowledge.

In the category Integration of Digital Technologies in Education in a Prison Context, with twenty-three items, most responses (twenty) were positive, suggested that prisoners consider that digital technologies are essential tools for the acquisition and consolidation of learning (Figure 4).

As can be seen in example record two hundred and sixty-six, student ES08 refers to the importance of technology as an enabling tool for learning and increasing knowledge. Other students share in the same opinion, referring that:

• ES04: Technologies can help a lot. If we have some work, to do this helps a lot. Now we can only go to the library to do research, but there there are limits to what can happen there. So with computers, it would be much easier. We do not have internet access, but if we had, even though guarded or barred from certain sites, it could allow us to research and to print, so that we could study better (RU 50).

• ES06: Just realize that this is a way of teaching and e-Learning and of course the computer makes up a huge lack. Technology can only contribute to an improvement of learning (RU 186).

These individuals accept the integration of digital technologies in their training because it brings something new to the prison context, and because it can actually contribute to improve the learning process. Pelizzari, and al. (2002) argue that the features included in technologies used in DL, such as computer tools, promote interaction and are constructivist, thus promoting the development of learning. Belloni (2009) adds that the pedagogy and technologies used in DL and e-Learning should not be separated from the teaching-learning process, so that the education of individuals can be fully integrated in the information and knowledge society. This approach is extremely important in understanding this process as being inseparable from the social rehabilitation of prisoners.

In the Integration of Digital Technologies in Education in a Prison Context category, with twenty-three items, most responses (twenty) were positive, suggesting that prisoners consider that digital technologies are essential tools for the acquisition and consolidation of learning.

3.2. Conditions for the development of the educational process inside prison

As for the Facilities and Equipment category, with forty items, all respondents refer to the fact that there are special learning facilities for HE students, but they do not have any computer equipment or technology to assist them in their learning process (Figure 5).

After reading and analyzing all example records, we can conclude that there is a study room for students attending HE at the school. As one of the technicians states: "TR01: There is a room where they can study. This space was created at school. They could go there three times per week (RU 318).

He says also:

• TR01: The higher education students do not have access. There is a room equipped with computers, but it belongs to the school (RU 338)".

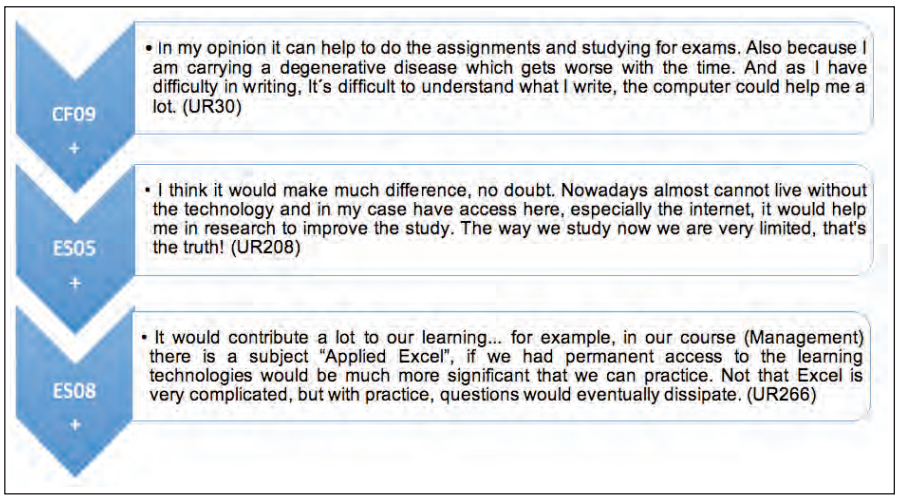

Figure 4. Integration of digital technologies in distance education.

This limits the access to digital content provided by the teachers on the different course units in each course, especially because, as Lévy states, "technologies have a key role in establishing the intellectual and space-time references of human societies" (1993: 75).

Considering this and the definition of e-Learning already given by Sangrà, Vlachopoulos e Cabrera (2012), who speak of an educational model that uses electronic means and devices to facilitate the access, evolution and improvement in the quality of education and training, it is not possible to talk of e-Learning at this prison, but rather of a "primitive" generation of DL".

The last category of our research, which was entitled Resources, consists of eighteen items. It shows that the educational resources that students have and can access are also scarce and limited.

As already mentioned, the resources available to students at this prison bring us back to the first generations of DL, whobasically relied on printed material for educational purposes. In contexts such as this one, where the digital reality is still remote, textbooks, notebooks, pens are, therefore, key resources, as they are physically tangible tools which belong to students and can be handled by them, as they are always at their disposal. But even these resources are scarce and often depend on the support of the University and technicians who assist in the educational process at the school. Figure 6 presents a summary of the participants' opinions on distance higher education in EPP.

In an increasingly digital society, in which education is supported by educational resources that include e-mail and online teaching platforms, Learning Management Systems (LMS) and Learning Content Management Systems (LCMS), discussion forums and web conference systems, (Lagarto & Andrade, 2009), according to Figure 6, the conditions for distance learning in EPP are still precarious.

4. Conclusions and future prospects

The digital world has not only become a reality, but also a huge need in terms of information and interaction. From this point of view, the world has become smaller and is borderless, in such a way that exchanges and interactions are inevitable and are part of daily life. In line with the global development of the various sectors of society, digital technologies must also be incorporated the educational process in prisons, in order to promote changes and transformations in its product and process.

The combination of the many methods and learning technologies that involve the interaction between educational approaches and technological resources is essential for promoting quality education in prisons in Portugal. The greatest challenge for higher education in prisons and, consequently, for new learning and teaching models or environments is to ensure that learners in a prison context develop appropriate skills and competences for their level of knowledge.

But in order to turn this into reality it is necessary to thoroughly redesign the architecture of information systems in prisons in Portugal, providing them with digital platforms to allow the implementation of DL and e-Learning, since the reading and analysis of the views of students/prisoners, applicants, and TSR (the latter having a more institutional opinion and perhaps being closer to reality), has led to the conclusion that the current situation in Porto prison and, by extension, other prisons in Portugal, has many weaknesses and limitations at this level that need to be resolv-

ed as quickly as possible.

As emphasized by the students/prisoners and TSR, IT resources must be strengthened and more technological resources must be provided in the prison, e.g. a content and learning management platform, or videoconference technologies, not currently available in the prison school.

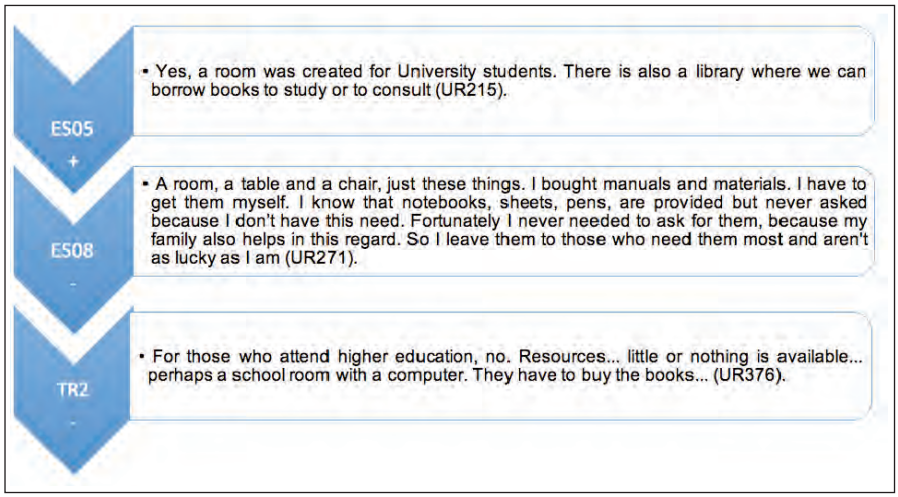

Figure 5. Facilities, equipment and resources.

Moreover, they also add the need for Internet (or intranet) and more support from teachers in educational activities in virtual classroom contexts as this is very flexible in terms of time and study plans, allowing them to also continue to study in other prisons or once they are released, anywhere in the world.

To address this challenge, and considering this framework outlined by the learner prisoners and senior technicians at the prison, the Open University (UAb) and the General Directorate of Prison Services and Social Rehabilitation (DGRSP) have recently signed a protocol (April 2016) stating in its 2nd clause the need and commitment to create and develop: "A Virtual Campus specifically designed for the prison population, with safe access and specific contents for developing activities in the field of education and training in Distance Learning and e-Learning".

Today, following the deepening of relations between the two institutions, this Virtual Education/Training Employability and Digital Citizenship Campus (EFEC@) is being designed with the main goal of building and developing an academic campus that responds to the organizational and training needs of DGRSP and of prisons.

The Virtual Campus will consist of various online services and will be supported by a technological platform that delivers e-Learning and eManagement technologies, in order to make the educational, academic, administrative and digital citizenship processes easier.

The idea of the Campus is to design an integrated information system, with e-Learning, eManagement, workflow and groupware technologies, with a view to the automation of administrative, decision-making and educational process, and to a more efficient management of resources and educational logistics.

This project is expected to address some of the issues referred to by the respondents in this study and the challenges posed today by the digital society and new technologies to DL and e-Learning, in particular in contexts of great social vulnerability, as is the case for the prison population, contributing, at the same time, to ensuring the right of access to education to all citizens, respecting the human rights of individuals, deprived of their freedom or otherwise.

The construction of the EFEC@ Virtual Campus is a complex and multifaceted challenge that requires collaborative commitment. For teachers and researchers at the Open University (UAb) there is a belief that this project will also help to fulfil the mission of UAb as a university anywhere in the world, across the political and geographical borders or prison walls, providing the conditions for t everybody to have the chance to invest in their own education.

Finally, we need to add that as an instrument of an active policy of public intervention and of citizenship, the Virtual Campus EFEC@ will seek to shape a multifaceted renewal matrix. The effective role of education as an essential frame of reference for equipping citizens for the new challenges of the knowledge society aims to foster a structured culture of innovation and requalification, as a tool for the development of institutions.

One must bear in mind that the prison context is very specific, closed within itself, and has unique rules. It is also important to stress and, above all, believe that it can make a difference to the education and training of priso-

ners. By introducing adapted and attractive technological and educational resources that can support and motivate these students, we can create opportunities for the development of skills aimed at their integration.

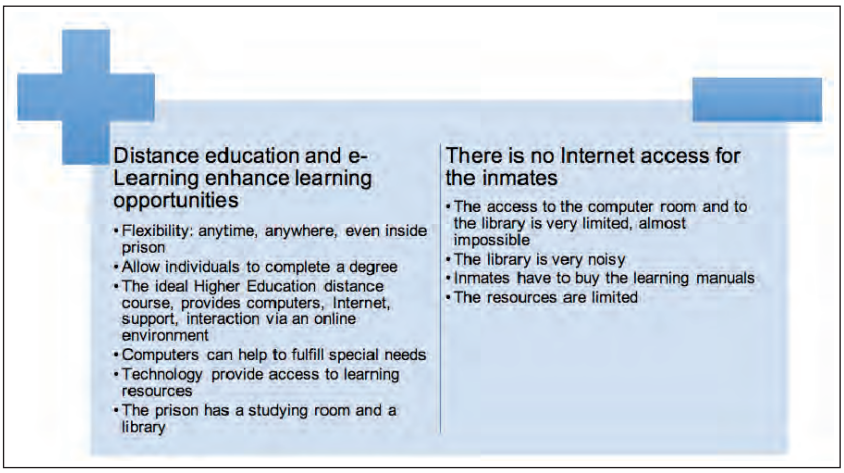

Figure 6. Participants' opinions on distance higher education in the Porto prison.

"Education for all, throughout life, equally accessible to the specific nature of each and every one, will necessarily cover the education and training of adults and, therefore, education and training in a prison context" (Tscharf, 2009: 148).

Funding agency

The second author is funded by National Funds through the FCT, Portugal (SFRH/BPD/ 92427/2013).

References

Bardin, L. (1977). *L´analyse de contenu*. París: PUF.

Barros, R., & Monteiro, A. (2015). E-learning for Lifelong Learning of Female Inmates: The Epris Project. In IATED (Ed.), *Edulearn15 Proceedings* (pp. 7056-7063). Barcelona: IATED. (https://goo.gl/8w7rX8) (2016-12-28).

Belloni, M. (2009). *Educação a Distância*. São Paulo: Autores Associados.

Bonk, C., & Graham, C. (Eds.) (2006). *The Handbook of Blended Learning, Global Perspectives, Local Designs*. San Francisco, USA: Pfeiffer. https://doi.org/10.5465/amle.2008.31413871

Collis, B., & Moonen, J. (2011). Flexibilidad en la educación superior: revisión de expectativas. [Flexibility in Higher Education: Revisiting Expectations]. *Comunicar, 37*(XIX), 15-24. http://dx.doi.org/10.3916/C37-2011-02-01

Decreto Ley 74/2006. *Diário da República* n.º 60: Serie I-A. (https://goo.gl/NlUeiY) (2016-10-05).

e-Learning Platforms and Distance Learning. Taller A5 de la Conferencia Europea sobre Educación en las Prisiones, 2010. (https://goo.gl/qYBTO1) (2015-10-22).

Comisión Europea (1999). *Declaración de Bolonia*. (https://goo.gl/Rp2ZrM) (2016-10-22).

Comisión Europea (2009). *Communiqué of the Conference of European Ministers Responsible for Higher Education*. (http://goo.gl/ZN32Ex) (2016-08-22).

Gaebel, M., Kupriyanova, V., Morais, R., & Colucci, E. (2014). *E-Learning in European Higher Education Institutions: Results of a Mapping Survey*. (https://goo.gl/H3HxPt) (2016-08-19).

Garrison, D., & Anderson, T. (2003). *E-learning in the 21st Century: A Framework for Research and Practice*. New York: Routledge Falmer. https://doi.org/10.4324/9780203838761

GHK (2010). *Grundtvig and Leonardo da Vinci Catalogue of Projects on Prison Education & Training*. (https://goo.gl/MxqtDR) (2016-01-02).

Hammerschick, W. (2010). *Report on E-learning in European Prisons - Concepts, Organisation, Pedagogical Approaches in Prison Education*. (https://goo.gl/gKoDLX) (2015-12-10).

Hamilton, E., & Feenberg, A. (2008). Os códigos técnicos do ensino. In J. Paraskeva & L. Oliveira (Orgs.), *Currículo e tecnologia educativa* (pp. 117-149). Mangualde: Edições Pedago.

Herrington, J., Reeves, T., & Oliver, R. (2010). *A Guide to Authentic e-learning*. New York: Routledge. https://doi.org/10.4324/9780203864265

Lagarto, J., & Andrade, A. (2009). Sistemas de gestão de aprendizagem em e-Learning. In G. Miranda (Org.), *Ensino online e aprendizagem multimédia* (pp. 5680). Lisboa: Relógio D' Água Editores.

Lemos, A., & Cunha, P. (2003). *Olhares sobre a cibercultura*. Porto Alegre: Sulina.

LICOS (2010). *E-learning in Prison Education in Europe: Recommendations for European Policy Makers*. (https://goo.gl/RK4mbi) (2015-06-01).

Lima, J., & Capitão, Z.C. (2003). *E-Learning e E-conteúdos*. Lisboa: Edições Centro Atlântico.

Lockitt, W. (2011). *Technology in Prisons*. (https://goo.gl/zeCJ5A) (2016-08-16).

Masie, E. (2006). The Blended Learning Imperative. In C. Bonk, C., & C. Graham (Eds.). *The Handbook of Blended Learning: Global Perspectives, Local Designs*. (p. 22-26). San Francisco: Pfeifer.

Miles, M., & Huberman, M. (1994). Drawing Valid Meaning from Qualitative Data: Toward a Shared Craft. *Educational Researcher, 13*, 20-30. https://doi.org/10.2307/1174243
Monteiro, A., Leite, C., & Lima, L. (2013). Quality of Blended Learning within the Scope of the Bologna Process. *Turkish Online Journal of Educational Technology, 12*(1), 108-118. (https://goo.gl/H4LMTT) (2016-12-27).
Monteiro, A., Moreira, J.A., & Leite, C. (2016). O e-Learning em Estabelecimentos Prisionais: Possibilidades e Limites para a Inclusão Digital e Justiça Social. *Revista Diálogo Educacional*, *16*(47), 77-102. https://dx.doi.org/10.7213/dialogo.educ.16.047.DS04
Moran, J. (2013). *O que é a educação a distância*. (https://goo.gl/nqNtoU) (2015-10-23).
Moreira, J.A., Monteiro, A., Machado, A., & Barros, R. (2016). *Sistemas prisionais. História e desafios educacionais da era digital*. Santo Tirso: Whitebooks.
Morgado, L. (2001). *O papel do professor no ensino online: Problemas e virtualidades.* Discursos, III Série, n.º Especial, 125-138. (https://goo.gl/b3A69B) (2016-12-23).
Pelizzari, A., Kriegl, M., Baron, M., Finck, N.T.L, & Dorocinski, S.I. (2002). Teoria da aprendizagem significativa segundo Ausubel. *Revista PEC*, *2*(1) 37-42. (https://goo.gl/Qt3w4j) (2016-12-23).
Pereira, A., Mendes, A., Morgado, L., Amante, L., & Bidarra, J. (2007). *Modelo pedagógico virtual da Universidade Aberta*. Lisboa: Universidade Aberta. (https://goo.gl/LeQTKX) (2016-12-21).
Rosenberg, M.J. (2001). *E-learning: Strategies for Delivering Knowledge in the Digital Age*. New York: McGraw-Hill. https://doi.org/10.1002/pfi.4140410512
Sangrà, A., Vlachopoulos, D., & Cabrera, N. (2012). Building an Inclusive Definition of E-learning: an Approach to the Conceptual Framework. *The International Review of Research in Open and Distance Learning, 13*(2), 145-159. http://dx.doi.org/10.19173/irrodl.v13i2.1161.
Turley, C., & Webster, S. (2010). *Implementation and Delivery of the Test Beds Virtual Campus Case Study*. National Centre for Social Research. (https://goo.gl/qvtDsY) (2015-05-01).
Tscharf, C.F. (2009). *Educação e Formação de Adultos em Prisões Portuguesas.* Dissertação de Mestrado em Ciências da Educação. Aveiro: Universidade de Aveiro. (https://goo.gl/yYriqW) (2016-12-21).
The County Governor of Hordaland (2005). *Case Study Norway Pipeline*. (https://goo.gl/w9GTMb) (2016-07-20)
Vala, J. (1986). A análise de conteúdo. In A. Silva, & J. Pinto, (Eds.), *Metodologia das Ciências Sociais.* (pp. 101-128). Oporto: Afrontamento.


GRUPO COMUNICAR
AULARIA
EL PAÍS DE LAS AULAS REVISTA DIGITAL DE EDUCOMUNICACIÓN
ISSN: 2253-7937
Editorial | Ideas Reflexiones | Temas Debate | Entrevistas | Experiencias | Interculturalidad | Análisis Imagen | Relatos | Un. Didácticas | Plataformas | Aula Viva | Publicaciones
Visitas desde Nov. 2011: 79708
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NÚMERO ABIERTO DE AULARIA: VOL. 6(2) JULIO - 2017,
QUE CUENTA DE MOMENTO CON: 6 ARTÍCULOS.
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Online Journal in Media Education. Grupo Comunicar.
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Comunicar, n. 51, v. XXV, 2017 | Media Education Research Journal | ISSN: 1134-3478; e-ISSN: 1988-3293
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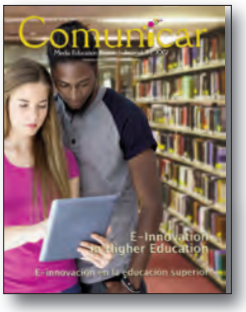

Online Questionnaires Use with Automatic Feedback for e-Innovation in University Students

Uso de cuestionarios online con feedback automático para la e-innovación en el alumnado universitario

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ABSTRACT

Technological tools have permeated higher education programs. However, their mere introduction does not guarantee instructional quality. This article presents the results of an innovation project aimed at fostering autonomous learning among students at a Pre-School and Primary Teacher Degree. For one semester all freshmen students used a system for autonomous learning embedded in the institutional online platform (Moodle), which included automatic formative feedback. The system was part of a complex formative assessment program. We present results of the experience concerning two aspects: the students' actual use of the system, and their final appraisal of it. The quantitative descriptive analysis focuses on the students' perspective to evaluate the adequacy of the instructional decisions. Results indicate that students need certain limits to be able to manage their learning better if we pursue the quality of innovation. These limits refer mainly to the time of accessibility and the limitation of attempts of practice. With respect to time, an appropriate span of time (neither too long nor too short) must be chosen; with respect to the number of attempts, it is expedient to limit rather than promote free endless access.

RESUMEN

Las herramientas tecnológicas han impregnado plenamente la Educación Superior. No obstante, el mero añadido no garantiza per se su calidad. Este artículo expone los resultados de un proyecto de innovación para fomentar el aprendizaje autónomo en los Grados de Educación Infantil y Primaria. Durante un semestre todos los alumnos de primer curso pudieron usar un sistema de aprendizaje autónomo en la plataforma online institucional (Moodle), apoyado con feedback formativo automático. El sistema se insertaba en un programa complejo de evaluación formativa. Se presentan resultados atendiendo a dos aspectos: uso real de los estudiantes y valoración final del sistema por parte de estos. El análisis cuantitativo descriptivo se centra en la perspectiva del estudiante para evaluar la adecuación de las decisiones pedagógicas tomadas. Los resultados indican que los estudiantes necesitan ciertos límites para poder organizar mejor su propio aprendizaje si queremos potenciar la calidad de la innovación planteada. Estos límites se concretan en variables tales como el tiempo de disponibilidad y la limitación de intentos de práctica. En el primer caso se debe atender a la duración adecuada de la oferta del sistema: tanto el exceso como el defecto de tiempo afectan a la cantidad y uso que realizan los estudiantes. En el segundo caso, la restricción de intentos es preferible a la práctica libre.

KEYWORDS | PALABRAS CLAVE

Autonomous learning, formative evaluation, automatic feedback, higher education, online questionnaires, blended learning, innovation, student.

Aprendizaje autónomo, evaluación formativa, feedback automático, educación superior, cuestionarios online, blended learning, innovación, estudiante.

Received: 2016-09-30 | Reviewed: 2016-11-25 | Accepted: 2016-12-05 | Preprint: 2017-02-15 | Published: 2017-04-01
DOI: https://doi.org/10.3916/C51-2017-05 | Pages: 51-60

1. Introduction

This work presents teaching innovation results concerning the use of online questionnaires to promote autonomous learning among university students. A teaching team with a long trajectory of collaborative work at different Teacher Degrees developed the innovation project. This joint trajectory allowed elaborating a shared comprehension of teaching, learning and assessment processes, of the incorporation of new information technologies (ICT) through online learning management systems, and of the resources and materials that the team designed. This shared vision of the teaching team affords innovation which requires a high degree of dedication and would be mostly inaccessible for individual teachers. The continued teaching collaboration is one of the keys to joint professional development (Mauri, Clarà, Ginesta, & Colomina, 2013). Through this article, we want to share our experience of this innovation to contribute to the collective reflection on university teaching, towards reflective and sustainable practice (Guskey, 2002).

The innovation project focused on the search for educational strategies to foster autonomous learning in a blended context. Previous studies report results that highlight the importance of promoting an active use of ICT to support learning efficiently (Collis & Moonen, 2011). This efficient use does not only depend on technological features of the instrument, but also on pedagogical decisions which ground it and allow transforming traditional practices (Coll, Mauri, & Onrubia, 2008). One of the key transforming axes, promoted by the European Space of Higher Education, is autonomous and self-regulated learning to form competent learners for the 21st century (Cernuda, Gayo, Vinuesa, & al. 2005). In this context, assessment emerges as an essential ingredient of this desired change, and particularly, formative and continuous assessment (Coll, Mauri, & Rochera, 2012; Sánchez-Santamaría, 2011). Hence, there is also an increase of interest in seeing how ICT efficiently contributes to these assessment processes.

1.1. Innovation: autonomous learning as a goal

This study is grounded on three complementary antecedents. First, the need for teaching assistance for learning in virtual and blended contexts (Coll, Mauri, & Onrubia, 2008). Second, feedback as the nexus between learning and assessment to offer this teaching assistance (Carless, Salter, Yang, & Lam, 2011; Nicol & Mcfarlane-Dick, 2006). And third, the potential of online questionnaires with formative feedback as a situated and contextualised task (Guo, Palmer-Brown, Lee, & Cai, 2014).

Innovation implies complex and demanding processes for instructors, which need to be evaluated. When instructors observe that the changes introduced in their practice produce an improvement in learning, a shift in attitude towards innovation and beliefs about it follows, and not the other way around (Guskey, 2002). From the socio-cultural perspective of teaching and learning, propounding good practices for innovation with ICT in higher education involves the understanding that placing the student at the centre of the process leads us to take three aspects into account. First, the students need to be mentally active to learn. Second, they should participate in as "authentic" and contextualized tasks as possible. And third, they should receive the instructor's guidance (or help from classmates) in the process. Thus, placing the student at the centre is not at odds with defining the instructor's role as a "necessary guide", beyond the role of facilitator of learning with ICT (Coll, Mauri, & Onrubia, 2008).

1.2. Formative assessment and automatic feedback

One of the challenges to improving autonomous learning lies in the resources to monitor the learning progress and offer feedback. In that sense, feedback is key according to certain conditions of implementation (Carless, Salter, Yang, & Lam, 2011).

Expectations put on ICT are not fully met because the overflow of data frequently exceeds the capacity of instructors in terms both of time and dedication. Therefore, we need to look for strategies which will make assessment, and specifically feedback, into sustainable processes for all parties. Moreover, recent studies highlight that the tasks designed to support autonomous learning and its assessment increase efficiency as they drip into the general teaching plan. The set of assessment tasks comprises then an "assessment system" or "assessment program" (Mauri, Ginesta, & Rochera, 2016). In this context, feedback on online tasks is an element of confluence to support both autonomous and self-regulated learning, and the assessment of learning results and processes (Hattie & Timperley, 2007; Hatziapostolou & Paraskakis, 2010; Shute, 2008). Thus, to enhance the effectiveness of autonomous learning, it is necessary to consider three relevant features of feedback (Carless, & al., 2011; Mauri, Ginesta, & Rochera, 2016). First, feedback must be written, specific and clear. Second, it must come at

the appropriate time. And third, it must inform about reasonable steps for the student to take afterward (feed-up, feed-forward).

1.3. Online questionnaires and formative feedback

Online questionnaires have become a commonly used "ICT resource" for learning and assessment (although they are not the only resource). They are instruments requiring hard work in their preparation (Morales, 2012; Moreno, Martínez, & Muñiz, 2015; Rodríguez Garcés, Muñoz, & Castillo, 2014). Among the advantages one can count is that they offer objectivity and rigour; they also guarantee reliability for the measure of learning setting one and the same standard for all students. Also, they provide immediate results. Finally, they make the monitoring sustainable for instructors, avoiding likely errors or biases of correction, among other advantages (Morales, 2012). We used, thus, this sort of instrument to offer the students formative feedback, immediate to their use of the questionnaire. The formative feedback differs from accreditative and verifying feedback in offering the student information which goes beyond providing the right answer or a numeric result. It offers hints about the error, on how to correct it, and also metacognitive suggestions which help to reflect about their own knowledge (Jolly & Boud, 2015; Williams, Brown, & Benson, 2015). In essence, the key is utilising feedback to make learning visible (Dysthe, Lillejord, Wasson, & Vines, 2011; Havnes, Smith, Dysthe, & Ludvigsen, 2012).

> The extense use of new technologies in Higher Education does not warrant by itself its maximal efficiency. A reflective implementation is necessary, which will maximize the potential of instruments. Only this way, we will be able to get the best results out of ICT, both for students and instructors.

1.4. General and specific goals

The general goal of this work is to share with the teaching community the reflection about the efficiency of an innovation project. For this general purpose, the following specific goals are set:

- To investigate the reported use of a support system designed to promote autonomous learning.
- To characterise the actual use of this system.
- To analyse students' appraisal of this support system.
- To explore the differences of autonomous study behaviour and learning results, according to particular pedagogical conditions.

2. Material and methods

2.1. Design of the innovation experience

The Project (founded by the Universidad de Barcelona) was carried out in a compulsory course of the Teacher Degrees (Pre-School and Primary School). The instructor team, composed of 13 instructors specialized in the area of Developmental and Educational Psychology, designed a bank of multiple choice questions with four response options and the respective feedback, referring to content on child development.

With this bank of questions the instructors built a set of questionnaires in the Moodle online platform (the institutional virtual campus). The questionnaires were piloted during one semester before the final implementation to revise and improve the questions, responses, and feedback, following the standard procedure for the elaboration of automatic multiple choice tests (Moreno, Martínez, & Muñiz, 2015).

Students accessed the questionnaires as part of a complex assessment program which included a wide variety of assessment activities distributed throughout the course (Coll, Mauri, & Rochera, 2012). The assessment program included the response to a test on contents related to children's development (motor, cognitive, communicative and socio-affective). The students sat the final test after two months of practice with the online questionnaires. The

practice questionnaires had the twofold goal of 1) being an instrument for support of autonomous learning of factual and conceptual contents, and 2) preparing for the final summative assessment of these topics. The practice questionnaires had 40 questions and were organised in three levels of increasing complexity, which could be accessed accomplishing minimal conditions: an average mark of at least five over 10 points, and a delay lapse of 24h between attempts. In each resolution access, the system randomized the questions as well as the items of response within each question. Level 1 comprised four questionnaires (one for each development area); level 2 comprised six questionnaires (combining contents of two areas of development) and level 3 offered a single questionnaire which emulated the final exam conditions (40 random items with a time limit of 20 minutes).

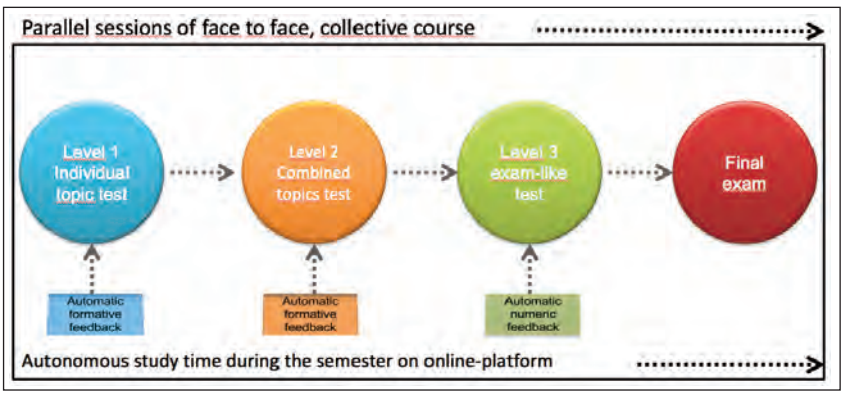


Figure 1. Support system for autonomous learning.

Figure 1 shows the system of questionnaires for practice, as it ran along with face to face lectures.

After every attempt, students got a numeric result with merely informative value, but without accrediting value. Also, in levels 1 and 2, they received an automatic formative feedback response to each of the responses they had selected, regardless of their being right or wrong. Feedback could present the following features (Guo, Palmer-Brown, Lee, & Cai, 2014; Hatziapostolou & Paraskakis, 2010):

In the case that the answer was wrong, they received motivational comments and tips for searching for the right information in the learning materials, for reflecting on the error, or on the concept or data at hand.

In the case that the answer was right, they received endorsement of the right answer.

2.2. Context and participants

Thirteen classes took part in the project, with 687 students of the second semester of the Teacher Degrees (Pre-school and Primary School), which constituted the whole population who started the Bachelor Degree in that academic course. The sample consisted of 88% women and 12% men; 50% were aged younger than 20, 43% were between 20 and 25 years old, 7% were older than 25 years old; 49% worked part-time, 5% worked full-time, and finally 46% did not work.

In this article, we present data and results of four groups with four different instructors and a total of 224 students. The selection of these four groups responds to a search of the best possible representativeness and displays the following conditions:

- Four groups without technical problems which did not report missing data.
- Two of these groups were of Pre-School teacher students and two of them were of Primary School teacher students.
- From each section, there was both one morning and one evening group.
- One of the groups, the control-group, followed the basic design for the use of questionnaires, while instructors in the other three groups altered the pedagogical conditions concerning the limit of individual access and the total time-span of access.

Specifically, the groups are as follows:

- Group Z (n=49), the basic design for reference: Access is delayed 24h between attempts; free time for response in levels 1 and 2, and time limited to 20 minutes in level 3; system freely accessible during two months (parallel to the usual face to face lecture).
- Group A (n=57), alternative design: System accessibility "constrained", limited to one month (in parallel to the second month of usual face to face lectures).
- Group B (n=64), alternative design: System accessibility "overexpanded" to three months (opened one month in advance to the usual face to face lectures).

• Group C (n=54), alternative design: Basic system accessibility but "limited" to three individual attempts at level 1, one single attempt at level 2 and level 3.

According to the goals, the blended characteristics of the course and the methodological requirements usual in these situations, the collection of data focused on three different, complementary axis:

• Data of reported use: final, anonymous Likert questionnaire.

• Data of actual use: frequency of access for resolution of questionnaires in level 1 during the whole time defined for autonomous learning, collected utilising the automatic tracking of the online platform Moodle.

• Appraisal of the material and its use: final, anonymous Likert questionnaire.

In all cases, the participants' consent was attained, the data of use were anonymised, as well as the final appraisal response, conserving merely the group code.

3. Analysis and results

We applied several complementary techniques of analysis. After a first descriptive analysis, data were contrasted statistically with the Kruskal-Wallis test, according to the characteristics of the sample and the data, to verify the existence of significant differences between the design conditions of each group of participants and the basic instructional design. We discarded contrasting variables such as gender and age because the sample was very biased in these aspects (in natural correspondence with the course and the degrees). In the following subsections, we present the procedure and results of each of the goals of our study.

3.1. Reported use

First of all, the students' responses to the questionnaire of reported study behaviour allowed us to draw the following robot sketch of their study method:

• Combining reading the materials and direct practice with questionnaires (61% fully or mostly agree).

• Individual use (82% fully or mostly agree).

• Taking notes of errors (91% fully or mostly agree).

• Taking notes of the right answer (86% fully or mostly agree).

• Taking notes of the feedback comments (feedback) (64% fully or mostly agree).

The analysis reveals significant differences between the basic design and two of the alternative groups: Table 1 shows these differences, which refer to two aspects:

• Reading the learning materials in anticipation of practice (less frequent in group B, with "expanded" time).

• Using the questionnaires individually (more common in group C, with "limited" access).

In summary, we interpret that the group with the widest span of time (B) for the study, did access the learning support system more frequently with a strategy of trial–and-error practice, without a previous reading of the corresponding texts. In contrast, the group with limited access (C) must ponder the attempts more carefully, and hence they proceeded with a previous, off-line reading of the learning contents to maximize results. Hence, the design affected the study behaviour of these two groups of students in opposite directions.

Table 1. Differences between groups in typical "reported" study behaviour (*p<.05)

My usual study actions consisted in... (evaluate 0-3)	Z	A	B	C
Reading all the contents before practising with the questionnaire	X 2.21 S .96	X 1.84 S .99	X 1.77 S .99 p=.0472*	X 2.36 S .97
Responding the questionnaire intuitively without a previous reading of the contents	X .71 S .94	X 1.22 S 1.16	X .89 S .98	X .80 S 1.07
Responding always alone	X 2.36 S .91	X 2.09 S .93	X 2.30 S .99	X 2.82 S .45 p=.0432*
Responding always with other study-mates	X .50 S .58	X .91 S .93	X .44 S .68	X .32 S .71
Combining group practice with individual practice	X 1.00 S 1.02	X 1.38 S 1.16	X.91 S 1.02	X .70 S 1.05
Taking notes of errors	X 2.57 S .57	S 2.38 S .98	X 2.67 S .66	X 2.50 S .88
Taking notes of the right answer	X 2.39 S .96	X 2.50 S .88	X 2.55 S .73	X 1.93 S 1.09
Taking notes of the feedback comments	X 2.00 S 1.02	X 1.66 S 1.10	X 2.00 S 1.05	X 1.91 S 1.14

3.2. Actual use

The same analysis in two phases was carried out for the actual use of the questionnaires. This analysis was performed only on data of level 1 of practice since it was focused on one single topic and presented new questions. In the following levels of practice, the students found the same questions again in combined questionnaires. We assume, thus, that a single attempt of response to the questionnaire does not provide evidence of feedback use (nor of its efficiency for improvement). We rather would need at least two attempts to potentially use feedback in an efficient manner (which benefit would increase with an increasing number of attempts). Thus, we proceeded to classify the attempts of resolution as follows:

Table 2. Differences between groups in the real use of the autonomous study support system (level 1) (p<.01)**

Real use of feedback	%Z	%A	%B	%C
No use	37%	14%	20%	7%
Minimal use	33%	28%	33%	31%
Moderate use	14%	26%	25%	31%
Frequent use	10%	14%	11%	30%
Very frequent use	6%	17%	11%	---
Average and standard deviation of completed resolution attempts (accesses)	X 7.55 S 4.99	X 10.63 S 7.40 p=.0061**	X 9.01 S 5.14	X 9.77 S 3.80 p=.002**

- No-use: up to four accesses of resolution altogether (one per section of topics).
- Minimal use: up to eight accesses of resolution altogether (two per section of topics).
- Moderate use: up to twelve accesses of resolution altogether (three per section of topics).
- Frequent use: up to sixteen accesses of resolution altogether (four per section of topics).
- Very frequent use: more than sixteen accesses of resolution altogether (more than four per section of topics).

Table 2 shows these result (see Table 2).

Globally speaking, one has to reckon a limited use of the questionnaires. In group Z, with the basic instructional design, over one-third of the students accessed the questionnaires less than four times altogether, showing a null use of feedback (37%). Another third showed a minimal use of the questionnaires (33%), whereas merely 16% showed frequent to very frequent use. The use of questionnaires increases slightly among the groups with an alternative design. In fact, we find some possible effects of design on the study behaviour: the group with a reduced time of access (A) increases its use of feedback significantly (26% moderate, 31% frequent or very frequent, and only 14%

Table 3. Students' appraisal of the innovation experience (*p<.05; **p<.01)

For me questionnaires were... (evaluate 0-3)	Z	A	B	C
Useful to identify errors	X 1.93 S .72	1.75 S .92	X 2.00 S .84	X 2.27 S .97 p=.0444*
Easy	X 1.54 S .64	X 1.72 S .63	X 1.42 S .80	X 2.20 S .59 p=0.0004*
Repetitive	X 1.36 S .83	X 1.47 S .92	X 1.35 S .97	X 1.39 S 1.04
Motivating	X 1.93 S .66	X 1.91 S .93	X 1.88 S 1.00	X 2.09 S .98
For me the three practice levels were...	**Z**	**A**	**B**	**C**
Useful to organise my study	X 2.36 S .73	X 2.22 S .79	X 1.85 S .93 p=.0206*	X 2.75 S .44 p=.0421*
Motivating	X 2.00 S .73	X 2.03 S 1.00	X 1.64 S 1.06	X 2.25 S .89
Useful to lower tension before the exam	X 1.96 S 1.10	X 2.09 S .96	X 1.89 S .99	X 2.48 S .88 p=.0321*
For me the 24h delay between attempts was...	**Z**	**A**	**B**	**C**
Useful to organise my study	X 1.11 S 1.07	X 1.19 S .97	X 1.14 S .97	X 1.93 S .97 p=.0025**
Motivating	X .89 S .83	X 1.13 S 1.07	X 1.02 S .95	X 1.80 S 1.05 p=.0007**
Useful to lower tension before the exam	X .75 S .89	X .97 S 1.06	X 1.05 S 1.03	X 2.00 S 1.10 p=.00001**

of no use). Thus, it is an "intensive" practice carried out by those students. In group C, in contrast, we do not find a "very frequent" use due to the instructional restriction (maximal three attempts for each questionnaire), but the other three options are balanced (around 30% for each of them), and the "frequent" use is high compared with the other groups (three times greater). This suggests that the questionnaires are used purposefully in this group.

3.3. Appraisal of the support system and learning results

The final questionnaire included questions on two different levels of detail: a) about the general conditions to access the questionnaires and thus the feedback; b) on the diverse forms of feedback designed by the instructors. The corresponding results are presented in Tables 3 and 4. Eventually, Table 5 presents the final learning results.

3.3.1. Appraisal of general conditions

In Table 3 we can observe significant differences between two of the groups with alternative designs, in contrast with the basic design concerning four aspects: 1) the possibility of identifying doubts and errors; 2) difficulty; 3) sense of repetition; 4) motivating potential. The results show that in group C with constrained access, students consider the questionnaires altogether easier and more useful to identify doubts and errors.

Table 3 shows as well that the existence of three levels of practice was more positively valued by the students in group C, due to the chance of "organising the individual study" and "reducing tension before the test". In contrast, in group B, with expanded time, students were less positive regarding the chances of organising individual study.

The 24h delay between attempts is, generally speaking, the least valued feature of the design. However, we still find a higher appraisal by students of group C, despite being low, as an organisation aid, for motivation and lowering of tension before the test.

3.3.2. Appraisal of specific conditions of feedback

For the specific conditions of feedback (Table 4), there are sharply significant differences in group A, with redu-

Table 4. Students' evaluation of feedback (*p<0.5; **p<.01)

Feedback allowed me to...(evaluate 0-3)	Z	A	B	C
Identify and correct errors	X 2.29 S .81	X 1.84 S 1.11	X 2.20 S 1.00	X 2.68 S .56 p=.0469*
Confirm my learning strategy	X 2.00 S .86	X 1.72 S 1.05	X 1.77 S .97	X 2.02 S .95
Revise my learning strategy	X 2.07 S .86	X 1.75 S 1.08	X 1.88 S .95	X 2.23 S.99
For me feedback was...				
Confusing	X 1.57 S .96	X 1.94 S .95	X 1.61 S 1.07	X 1.05 S 1.14 p=.0409*
Repetitive	X 1.21 S.79	X 1.78 S 1.01 p=.0243*	X 1.20 S 1.03	X 1.20 S .90
Funny	X 1.04 S .96	X 1.47 S 1.02	X 1.11 S .98	X 1.86 S .95 p=.0015**
Interesting	X 1.93 S .94	X 1.72 S .85	X 1.92 S .92	X 2.34 S .75
Motivating	X 1.89 S .92	X 1.59 S .98	X 1.71 S .92	X 2.34 S .78 p=.03737*
Most useful when they led me to reflect	X 2.07 S .81	X 2.34 S .70	X 2.02 S .87	X 2.48 S .66 p=.0409*
Most useful when they told me where to find the correct information	X 2.07 S .86	X 2.03 S .93	X 2.23 S .86	X 2.27 S .73
Most useful when they made me laugh	X .89 S .96	X .88 S .94	X 1.23 S .99	X 1.64 S 1.16 p=.0103*

ced time, where students perceived the tips as more "repetitive". In contrast, group C stands out again for positive evaluations of multiple aspects of the feedback. Those students value more highly the help provided for the identification of errors, first; second, they value feedback as more motivating, funnier, and more useful to reflect or laugh. Moreover, their appraisal is significantly lower when indicating the feedback as "confusing".

Tabla 5. Diferencias entre grupos en calificaciones finales (p<.01).**

	Z	A	B	C
Calificación final	X 7.5 S 1.3	X 7.2 S 1	X 7.6 S 1.5	X 9.2 S 8 p=0**

3.3. Learning results

Finally, the learning results were collected via the online platform, through the final exam which was administered to assess learning (Table 5).

Results show that group C, again, stands out above the other groups with significantly better results, which allows us to interpret improved effectiveness of instructional conditions in that group.

4. Discussion and conclusions

The results of this innovation experience show that the most favorable conditions to foster autonomous learning of students focus on a moderate time span of system accessibility (two months versus just one or up to three) and a constraint to the number of attempts (versus no limits to individual attempts). Before discussing these results, it is important to note the data of significance reported in the previous section, related to the reported use of the students, their actual use, their appraisal of the support system, and eventually their results at the final exam. Very frequently, projects presenting assessment of innovation experiences limit themselves to reported use and posthoc appraisals (Gómez-Escalonilla, Santín, & Mathieu, 2011; Zaragoza, Luis-Pascual, & Manrique, 2009). In this sense, our work offers data of complementary triangulation that we consider indispensable in evaluating the processes of innovation from its very context of complex practice, which is even more important when the implementation of ICT allows tracking of the actual use. Concerning the time of accessibility as provided by design, it is noteworthy that the access occurs parallel to the face-to-face sessions which were dedicated to working through the learning contents (Figure 1).

In face-to-face sessions, the students had the chance (if they wanted to) to share doubts about the questions, responses, and feedback in the questionnaires. This allows supporting the autonomous learning of the students outside the classroom with the instructor's guidance. Following Carless and colleagues (2011), one of the quality criteria of feedback consists in it being a dialogue process with the instructor, not only received as a unidirectional message. In blended instructional proposals, the dialogue about feedback can proceed in a particularly adjusted manner in the face-to-face sessions. In fact, the blended component added to the learning processes has been identified in recent works as a desirable option to support the students' learning, even if one departs from a pure e-learning model. On the other hand, learning, as a process, needs time, and so we can interpret that the fast response of the questionnaires during just one month (group A) was not sufficient.

Concerning the number of attempts of resolving the practice questionnaires, from a critical point of view, one could consider that the innovation experience was not successful since the students' use is certainly light overall. However, a second reading allows some important conclusions for university teaching. To begin with, one of the benefits that are usually allotted to the online context is that of complete and free accessibility; the user is free to choose the moment and the location of access. Yet, the results of our work show that this is only partially true. It is true that students do not appreciate the restriction of 24h delay to access between attempts because they perceive it as a limitation of freedom of action. Nevertheless, now we know that an unrestricted limitless access, with as much time as possible –in other words, the absence of whatsoever restrictions to access–, did not imply a greater use of the instrument, nor did it throw better learning results. It seems sensible, thus, that it is not the absence of restrictions but the presence of certain conditional constraints which favors the organization and the autonomous regulation to self-adaption to these conditions, parallel to other contexts and requirements that join in time for students (parallel courses, personal work, family life). It is also important to consider the phenomenon of "false sense of security" (Petersen, Craig, & Denny, 2016), which may evolve with the use of instruments of multiple choice, jeopardising the final results, blurring actual learning, provoking in the user a cessation of practice ahead of time, thus limiting the practice really needed.

As for the characteristics of the automatic feedback included in the online questionnaires, this work also confirms that its potential to foster learning depends on the technological conditions of use, led by pedagogical criteria (Carless, 2006; Nicol, & Mcfarlane-Dick, 2006). The results of the use of feedback and the learning results of group C (two points higher than the other groups) highlight the importance of timely feedback, provided immediately following the response to the questionnaire. Feedback also should complete the summative information about the results (marks) with information to continue learning. Also, especially, feedback should endorse the reflection on performance; it should also sustain students' motivation to overcome difficulties, which is something feedback may address by means of humor, a fact only significant in the case of students with the highest competence (Del-Rey, 2002).

Finally, e-innovation can (and ought to) put the student at the centre but only with pedagogical scaffolds that adjust to the students' need in their learning process. Not everything "doable" with technology contributes equally to this goal. The instructor's interventions are essential as well as the improvement of processes through professional development.

Despite the fact that current institutional conditions privilege research activity above teaching efforts, it is also true that the university community values and optimizes day by day opportunities to discuss advances to confront the most urgent challenges that we face. The research presented on the use of practice questionnaires for autonomous learning with the help of more productive e-feedback, which might also allow instructors to monitor the processes in a sustainable way, is part of this broader goal of understanding and better tackling of the complexity of the teaching action with ICT in higher education. Obviously, online questionnaires with automatic feedback are not the only resource for e-innovation, but the work we present allows using them with pedagogical criteria of improvement. Future studies should aim at a deeper understanding of possible influencing variables such as gender, prior education before accessing graduate studies, and students' age, which was beyond the reach of this study due to the natural conditions of the sample.

Funding agency

Teaching innovation project «El uso de cuestionarios con feedback como instrumentos de evaluación para la autorregulación del aprendizaje en Psicología de la Educación en los grados de maestro», founded by the University of Barcelona (2014PID-UB/046).

References

Carless, D. (2006). Differing Perceptions in the Feedback Process. *Studies in Higher Education*, *31*(2), 219-223. https://doi.org/10.1080/03075070600572132

Carless, D., Salter, D., Yang, M., & Lam, J. (2011). Developing Sustainable Feedback Practices. *Studies in Higher Education*, *36*(4), 395-407. https://doi.org/10.1080/03075071003642449

Cernuda, A., Gayo, D., Vinuesa, L., Fernández, A.M., & Luengo, M.C. (2005). Análisis de los hábitos de trabajo autónomo de los alumnos de cara al sistema de créditos ECTS. *Jornadas sobre la Enseñanza Universitaria de la Informática*, Madrid. (https://goo.gl/Z4hze5) (2016-06-25).

Coll, C., Mauri, T., & Onrubia, J. (2008). El análisis de los procesos de enseñanza y aprendizaje mediados por las TIC: una perspectiva constructivista. In E. Barberà, T. Mauri, & J. Onrubia (Eds.), *La calidad educativa de la enseñanza basada en las TIC. Pautas e instrumentos de análisis* (pp. 47-62). Barcelona: Graó.

Coll, C., Mauri, T., & Rochera, M.J. (2012). La práctica de evaluación como contexto para aprender a ser un aprendiz competente. *Profesorado*, *16*(1), 49-59.

Collis, B., & Moonen, J. (2011). Flexibilidad en la educación superior: revisión de expectativas. [Flexibility in Higher Education: Revisiting Expectations]. *Comunicar*, *37*, 15-25. https://doi.org/10.3916/C37-2011-02-01

Del-Rey, J. (2002). La risa, una actividad de la inteligencia. *CIC*, 7, 329. (https://goo.gl/WLrsT4) (2016-06-14).

Dysthe, O., Lillejord, S., Wasson, B., & Vines, A. (2011). Productive e-Feedback in Higher Education. Two Models and Some Critical Issues. In T.S. Ludvigsen, A. Lund, I. Rasmussen, & R. Säljö (Eds.), *Learning across Sites. New Tools Infrastructures and Practices* (pp. 243-258). New York: Routledge. (https://goo.gl/8P9ufZ) (2016-07-29).

Gómez-Escalonilla, G., Santín, M., & Mathieu, G. (2011). La educación universitaria online en el Periodismo desde la visión del estudiante [Students' Perspective Online College Education in the Field of Journalism]. *Comunicar*, *37*, 73-80. https://doi.org/10.3916/C37-2011-02-07

Guo, R., Palmer-Brown, D., Lee, S.W., & Cai, F.F. (2014). Intelligent Diagnostic Feedback for Online Multiple-choice Questions. *Artificial Intelligence Review*, *42*, 369-383. https://doi.org/10.1007/s10462-013-9419-6

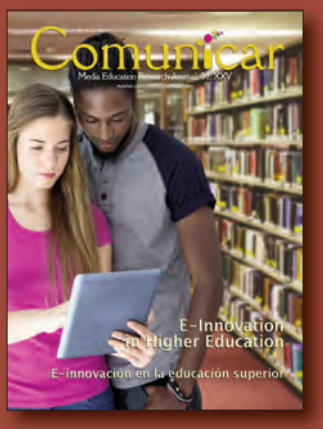
Guskey, T.R. (2002). Professional Development and Teacher Change. *Teachers and Teaching*, *8*, 3, 381-391. https://doi.org/10.1080/135406002100000512

Hattie, J., & Timperley, H. (2007). The Power of Feedback. *Review of Educational Research*, *77*, 1, 81-112. https://doi.org/10.3102/003465430298487

Hatziapostolou, T., & Paraskakis, I. (2010). Enhancing the Impact of Formative Feedback on Student Learning Through an Online Feedback System. *Electronic Journal of e-Learning*, *8*(2), 111-122. (https://goo.gl/4sPtbL) (2016-05-15).

Havnes, A., Smith, K., Dysthe, O., & Ludvigsen, K. (2012). Formative Assessment and Feedback: Making Learning Visible. *Studies in*

Educational Evaluation, *38*(1), 21-27. https://doi.org/10.1016/j.stueduc.2012.04.001
Jolly, B., & Boud, D. (2015). El feedback por escrito. Para qué sirve y cómo podemos hacerlo bien. In D. Boud, & E. Molloy (Eds.), *El feedback en educación superior y profesional. Comprenderlo y hacerlo bien* (pp. 131-152). Madrid: Narcea.
Mauri, T., Clarà, M., Ginesta, A., & Colomina, R. (2013). La contribución al aprendizaje en el lugar de trabajo de los equipos docentes universitarios. Un estudio exploratorio. *Infancia y Aprendizaje*, *36*(3), 341-360. https://doi.org/10.1174/021037013807533025
Mauri, T., Ginesta, A., & Rochera, M.J. (2016). The Use of Feedback Systems to Improve Collaborative Text Writing: A Proposal for the Higher Education Context. *Innovations in Education and Teaching International*, *53*(4), 411-424. (https://goo.gl/QGIO8u) (24-12-2016).
Morales, P. (2012). *Análisis de ítems en las pruebas objetivas*. Madrid: Universidad Pontificia Comillas.
Moreno, R., Martínez, R.J., & Muñiz, J. (2015). Guidelines based Validity Criteria for Development of Multiple-choice Items. *Psicothema*, *27*(4), 388-394. (https://goo.gl/NyvRIi) (2016-05-20).
Nicol, D.J., & Macfarlane-Dick, D. (2006). Formative Assessment and Self-regulated Learning: a Model and Seven Principles of Good Feedback Practice. *Studies in Higher Education*, *31*(2), 199-218. https://doi.org/10.1080/03075070600572090
Petersen, A., Craig, M., & Denny, P. (2016). Employing Multiple-Answer Multiple-choice Questions. *ITiCSE '16 Proceedings of the 2016 ACM Conference on Innovation and Technology in Computer Science Education*, 252-253. New York. https://doi.org/10.1145/2899415.2925503
Rodríguez-Garcés, C., Muñoz, M., & Castillo, V. (2014). Tests informatizados y su contribución a la acción evaluativa en educación. *Red*, 43, 1-17. (https://goo.gl/c7wkKx) (2016-12-24).
Sánchez-Santamaría, J. (2011). Evaluación de los aprendizajes universitarios: una comparación sobre sus posibilidades y limitaciones en el Espacio Europeo de Educación Superior. *Revista de Formación e Innovación Educativa Universitaria*, *4(*1), 40-54. (https://goo.gl/ufYG3p) (2016-06-30).
Shute, V. J. (2008). Focus on Formative Feedback. *Review of Educational Research*, *78*, 153-189. https://doi.org/10.3102/0034654307313795
Williams, B., Brown, T., & Benson, R. (2015). Feedback en entornos digitales. En D. Boud, & E. Molloy (Eds.), *El feedback en educación superior y profesional. Comprenderlo y hacerlo bien* (pp. 153-168). Madrid: Narcea.
Zaragoza, J., Luis-Pascual, J.C., & Manrique, J.C. (2009). Experiencias de innovación en docencia universitaria: resultados de la aplicación de sistemas de evaluación formativa. *Revista de Docencia Universitaria*, *4*, 1-33. (https://goo.gl/O4KHqG) (2016-06-30).



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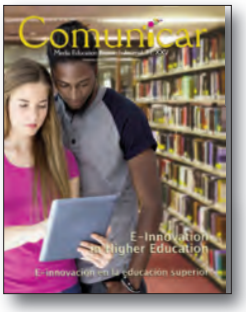
Comunicar, n. 51, v. XXV, 2017 | Media Education Research Journal | ISSN: 1134-3478; e-ISSN: 1988-3293
www.comunicarjournal.com



The Use of Social Media and Popular Culture to Advance Cross-Cultural Understanding

El uso de las redes sociales y la cultura popular para una mejor comprensión intercultural

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ABSTRACT
Although we live in a global society, educators face many challenges in finding meaningful ways to connect students to people of other cultures. This paper offers a case study of a collaboration between teachers in the US and Turkey, where 7th grade students interacted with each other via online social media as a means to promote cultural understanding. In a close analysis of a single learning activity, we found that children had opportunities to share ideas informally through social media, using their digital voices to share meaning using online writing, posting of images and hyperlinks. This study found that students valued the opportunity to develop relationships with each other and generally engaged in sharing their common interests in Hollywood movies, actors, celebrities, videogames and television shows. However, not all teachers valued the use of popular culture as a means to find common ground. Indeed, teachers had widely differing perspectives of the value of this activity. Through informal communication about popular culture in a «Getting to Know You» activity, students themselves discovered that their common ground knowledge tended to be US-centric, as American students lacked access to Turkish popular culture. However, the learning activity enabled students themselves to recognize asymmetrical power dynamics that exist in global media culture.

RESUMEN
Si bien vivimos en una sociedad global, los educadores se enfrentan a numerosos desafíos a la hora de hallar formas significativas de conectar a los alumnos con gente de otras culturas. Este artículo muestra un caso práctico de colaboración entre profesores de los Estados Unidos y Turquía, en el que alumnos de séptimo grado interactuaron entre sí a través de las redes sociales con el fin de promover la comprensión cultural. Al analizar una única actividad de aprendizaje hallamos que los alumnos tenían la oportunidad de compartir ideas informalmente a través de las redes sociales, usando su voz digital para compartir significados mediante la escritura online, publicación de imágenes e hipervínculos. Este estudio halló que los alumnos valoraban la oportunidad de relacionarse entre sí y tendían a compartir su interés común en películas de Hollywood, actores, famosos, videojuegos y programas de televisión. Sin embargo, no todos los profesores valoraban el uso de la cultura popular como medio para la búsqueda de puntos en común. En efecto, los profesores tenían perspectivas muy distintas sobre el valor de esta actividad. Mediante la comunicación informal en torno a la cultura popular en una actividad de conocimiento mutuo, los propios alumnos descubrieron que sus conocimientos en común tendían a estar centrados en los Estados Unidos, en tanto en cuanto los alumnos estadounidenses no tenían acceso a la cultura popular turca. Sin embargo, la actividad de aprendizaje permitió a los propios alumnos reconocer las dinámicas de poder asimétrico que existen en la cultura mediática global.

KEYWORDS | PALABRAS CLAVE
Digital media, social media, global, alfabetización, Educación Secundaria, cultura popular, intercultural.
Media digitales, medios sociales, global, literacy, Middle School, popular culture, cross-cultural.

Received: 2016-06-17 | Reviewed: 2016-08-08 | Accepted: 2016-12-09 | Preprint: 2017-02-15 | Published: 2017-04-01
DOI: https://doi.org/10.3916/C51-2017-06 | Pages: 63-72

1. Introduction

Undoubtedly, Web 2.0 technologies enable learners to travel across time and space. In the past two decades, all around the world, most general accounts of education have emphasized that schooling needs to take account of the multiple channels of communication and media now in popular use (Lee, Lau, Carbo, & Gendina, 2012; New London Group, 1996). In the context of English language arts education, in particular, the traditional print-based concepts of literacy, text, and meaning are becoming strategically displaced as teachers and school leaders begin to recognize that people now use language, images, sound, and multimedia for everyday purposes of expression and communication and that the relevant associated competencies must be part of elementary and secondary education (Hobbs, 2010; Tuzel, 2013a; Tuzel, 2013b). Undoubtedly, literacy today is "situationally specific" and "dynamically changing" (Coiro, Knobel, Lankshear, & Leu, 2008: 5) all around the world. In Turkey, for example, there has been a significant investment in providing access to digital technology in elementary and secondary schools to support teaching and learning (Unal & Ozturk, 2012).

In this paper, we present a case study of an international collaboration involving middle school teachers from two countries, working in collaboration with the authors to design and implement an intercultural learning experience that brings together Turkish and American students in Grade 7 using digital and social media. The goal of the initiative was designed to help students (a) develop confidence in expressing themselves with people using online social media, (b) promote cultural knowledge and critical thinking about media and popular culture, and (c) advance global understanding between middle-school students in Turkey and the United States. By linking together subject-area instruction in social studies and foreign language education in English, this initiative explored how to use the power of social media for sustained social and cultural interaction over a period of six weeks. Evidence from this case study demonstrates that the use of digital and social media to activate children's voice requires sensitivity to differential perceptions of the value of popular culture among teachers as well as robust appreciation of the asymmetries and inequalities still inherent in global information and entertainment flows.

1.1. Cross cultural learning goes digital

Globalization and digital technology have combined to open up cultures to a fast-paced world of change and educators have been inspired to bring the world into their classrooms, enabling students to have a civic voice (Hobbs, 2010; Stornaiuolo, DiZio, & Helming, 2013). Although traditional global pen pal programs have been in place in the USA since the 1920s (Hill, 2012), in the years after the 9/11 terrorist attack, some educators began exploring with how to promote student voice and global understanding to bring together Americans and peoples of the Middle East through cross-cultural communication learning experiences. To increase students' experiences with people different from themselves, such projects may include work with international students from local universities, immigrant organizations in the community, service learning projects, exchanges through e-mail or videos, and taking students overseas (Merryfield, 2002). In these projects, teachers may ask students to use email or online communication to develop keyboard skills, share poetry, report writing, and journal writing – all fundamental dimensions of literacy education.

The rise of social media has made it easier for teachers and students from diverse cultures to meet and work together. Teachers may emphasize cross-cultural learning experiences as a transformative way to teach "children to care and make a difference in the world while simultaneously trying to make a difference in the world" (Aldridge & Goldman, 2007: 78). Such efforts can be useful not only to students, but to teachers as well. Cross-cultural projects may not only promote confidence in self-expression, but may also promote the development of reflective-synthetic knowledge, a concept articulated by Kincheloe (2004) who described it as a process that advances student voice while revealing to both teachers and students the often hidden assumptions about the nature of knowledge itself.

1.2. Media and digital literacy for global education

The term digital literacy has begun to emerge to reflect the broad constellation of practices that are needed to thrive online (Rheingold 2012; Gilster, 1999). Most conceptualizations focus on the pragmatic skills associated with the use of digital tools and texts. As Greenhow, Robelia and Hughes (2011: 250) note, "Digital literacy includes knowing how and when to use which technologies and knowing which forms and functions are most appropriate for one's purposes". But other definitions explicitly conceptualize digital literacy as a broader literacy competency, building on the tradition of media literacy and including the ability of learners to access, analyze, create, reflect and

take action using the power of communication and information to make a difference in the world (Hobbs, 2010).

Even more broadly, across Europe, Asia, South America and Africa, the term media and information literacy (MIL) has been recognized as a means to foster more equitable access to information and knowledge; promote freedom of expression; advance independent and pluralistic media systems; and improve the quality of education. By empowering "citizens to understand the functions of media and other information providers, to critically evaluate their content, and to make informed decisions as users and producer of information and media content", media and information literacy, while sometimes seen as separate and distinct fields, are conceptualized as a combined set of competencies necessary for life and work today (UNESCO, 2013: 16).

Only a few school-based projects have aimed to advance learner voice by connecting young people from across communities to promote cultural understanding through media literacy. For example, elementary educators in the USA used a variety of media literacy practices, including viewing and discussion, critical analysis of images, film/media production and interaction with young people from Kuwait as a way for children to gain knowledge of the people and culture of the region (Hobbs & al., 2011a; Hobbs & al., 2011b). By talking about how news, media and popular culture embed stereotypes about culture and values, children as young as eight and nine were able to recognize that media messages (including photographs, movies, websites and books) can be critically interrogated. Media analysis and production activities can help build critical thinking and activate student voice while simultaneously advancing knowledge and language skill development (Hobbs, 2007; Tuzel, 2012a; Tuzel, 2012b). For example, during the process of an action research project, a Turkish teacher who used media literacy education activities in language arts, using popular culture texts (film, TV serial, magazine etc.) for learning, found increases in students' levels of media literacy, critical thinking and language skills; in addition to expanding textual awareness, this learning activity shifted learners' conceptualization of literacy from the alphabetic to the multimodal (Tuzel, 2012a).

> Evidence from this case study demonstrates that the use of digital and social media to activate children's voice requires sensitivity to differential perceptions of the value of popular culture among teachers as well as robust appreciation of the asymmetries and inequalities still inherent in global information and entertainment flows.

Social media and other virtual environments have the potential to play a role in terms of cultivating intellectual curiosity and advancing civic voice in conjunction with learning about people and cultures around the world. Intergroup dialogue (generally involving young adults) has been shown to be effective in combating negative stereotypes and prejudices about countries and cultures, promoting tolerance and intercultural acceptance (Hurtado, 2005) and a growing number of organizations are bringing global dialogues to college students using digital media (Soliya, 2014). However, historical asymmetries of status and power between groups may affect the quality of learning for the majority/empowered and minority/disempowered group members (Cikara, Bruneau, & Saxe, 2011).

Accordingly, based on this review of the literature, we report the results of a single school-based instructional activity that aimed to activate student voice and promote global awareness. In exploratory research, we examine these research questions: How did US and Turkish learners and teachers experience the cross-cultural communication project? What were the affordances and limitations of using a social media exchange activity for activating student voice and building cross-cultural understanding?

2. Methods

This section briefly summarizes the case study method we employed to explore the use of a private online social network to facilitate co-learning between middle-school teachers and students in the United States and Turkey. The project was designed to enable American and Turkish students to (a) develop confidence in expressing themselves

with people using online social media, (b) promote cultural knowledge and critical thinking about media and popular culture, and (c) advance global cultural understanding between middle-school students in Turkey and the United States. By linking together subject-area instruction in social studies and foreign language education in English, this initiative helped both teachers and learners explore how to use the power of an online social network for sustained social and cultural interaction.

A six-week online cross-cultural learning experience program using a private online social network was developed and implemented by researchers in collaboration with The George School faculty (a pseudonym for a private school in Northern California) and the faculty of The Blossom School (a pseudonym for a private school in Western Turkey). Close analysis of one lesson provided us with an opportunity to gather exploratory data about the way teachers and students perceive the value of using one's voice to encounter people from another culture and learn about their lives, experiences and interests.

A total of 84 children between the ages of 12 and 14 participated in the project. A middle-school history teacher at George School and his 43 Grade 7 students worked with five English teachers at Blossom School in Turkey, along with two M.A. students in Education, and 41 Grade 7 Turkish students enrolled in an English class.

2.1. Research process

In this study, interviews, documents, observations, video recordings and students' work samples were used to analyze the quality of the learning experience. The researchers conducted interviews with both teachers and students before, during and after the implementation to record the thoughts and opinions of the teachers and students. The researchers paid special attention to changes in students' comments about the other culture. The authors also focused on the reasons for the posts and interactions of the students. Therefore, the authors tried to make an extensive analysis of the causes of events and situations (Ellet, 2007:19). Data triangulation provides support for reliability as different data collection tools including interviews, observation and written and visual document analysis in the social network were used. In both schools, students participated in the project and performed the tasks requested of them during the implementation on a voluntary basis.

2.2. Curriculum development

Using the model of a university-school partnership, Turkish and American middle-school teachers worked collaboratively with researchers to prepare four lesson plans based on the core principles of media literacy (NAMLE, 2008). University school partnerships provide important supports to educators who aim to explore innovative instructional practices in digital and media literacy education (Moore, 2013). The development of four lesson plans enabled students to share information about the culture and the values of their family and community, learn more about the history, cultural practices and social norms of these two cultures, and critically analyze popular entertainment media representations of culture and values. Table 1 provides a summary of the complete curriculum as aligned with elements from the five-part AACRA definition of digital and media literacy (Hobbs, 2010). Researchers

Table 1. Curriculum for "California-Turkey Cultural Exchange through Social Media" Project

Key elements of the curriculum	Media Literacy Dimensions (AACRA)
1. Getting to know you	
Share three things about yourself and your culture in one week. The students can share a sentence, photo, video or any other thing they wanted to share.	Access, create.
2. Create a short film about your culture and life	
Create and share a short video that describes aspects of your daily life.	Reflect, create.
3. Critically analyze TV shows that feature students, teachers and schools	
Compare and contrast two video excerpts from USA and Turkish television that are set in high school and feature the representation of high school teachers and students.	Access, analyze, create, reflect.
4. Discussion of Current Events	
Read and discuss a news magazine article about current events in the Ukraine.	Access, analyze, create, reflect.

and teachers were careful to include a balance of learning experiences that encouraged students to access, analyze, create, and reflect on information and ideas in the context of the global co-learning experience. Before implementation of the curriculum, the researchers held four online planning meetings with both Turkish and American teachers where a timetable and learning process was established and the students were pre-registered in the social media platform.

3. Findings

In order to focus on how middle-school students developed confidence in expressing themselves using online social media by finding common ground with peers from halfway around the world, we describe and analyze the implementation of only the first lesson. In a close analysis the "Getting to Know You" learning activity, children had opportunities to share ideas informally through social media, using their digital voices to share meaning using online writing and posting of images. While students valued the opportunity to develop relationships with each other by sharing their common interests in Hollywood movies, actors, celebrities, videogames and television shows, teachers had widely differing perspectives of the value of this activity. Through informal communication about popular culture, students themselves discovered that their common ground knowledge tended to be US-centric, as American students lacked access to Turkish popular culture. The learning activity foregrounded the asymmetrical power dynamics that exist in global media culture where information and entertainment flows are primarily one-way in nature and perceptions about the value of popular culture are contested. As is appropriate with case study research, we interweave interpretation with narrative description.

3.1. Learning to talk across cultures

• Lesson 1, "Getting to Know You", was an ice breaker activity, aimed to introduce students to each other and help them develop confidence in interacting with others as they gained familiarity with the Ning social media platform. Through this activity, students began to discover their similarities and differences. Teachers asked their students to share three things about themselves and their culture in one week; they did not limit students about the structure, length or content of their posts. The 84 participating Turkish and American students could share a sentence, photo, video or any other thing they wanted to share. In order to support students in the process of relationship formation, students were assigned to one of seven groups (with six students in each group). The small group structure made it easier for students to read and follow each other's posts and respond to each other personally. Students shared 391 posts during the implementation of Lesson 1, for an average of 4.6 posts per student during the week. Some of these posts were questions designed to engage another student while others were just aimed at presenting themselves and their own culture.

Students demonstrated significant interest in participating in this activity. However, in the first few days, they sometimes had difficulty responding to questions or commenting on each other's posts. Two main reasons seem evident: most importantly, Turkish students were expressing themselves in a foreign language while USA students were communicating in their native language. Also, the ten-hour time difference between The Blossom School and The George School made it initially difficult for students to understand how to follow each other's comments. It took a few days for students to understand how to navigate and read the posts as Turkish and American students each posted comments at different times of the day (at school) and the evening (at home).

The novelty of "talking" across space and time was fascinating to many young students. Early on, a student from The George School noted:

• "USA Student 1: This is kind of a random comment, but I think that it is kind of mindblowing when you think about the fact that two people can be sitting at a computer, typing on the same forum, but for one person it is the early morning (it is 10:40 in the morning as I type this) and for the other it is late at night (I think it is 8:40 at night in Turkey)".

Students enjoyed the opportunity to interact socially and share information about their own culture. In general, students preferred to write simple sentences. However, students also uploaded photos and videos of themselves, friends and family, favorite places and food. Some students shared links to music, movie series and computer games they loved, asked what their peers thought about them, or responded to similar questions. The researchers observed that the students visited their profiles and the discussion board many times during the week when Lesson 1 was being implemented. Student behavior reflects Stern's (2008) observation about the authentic personal pleasure young adolescents experience using social media for self-presentation and peer validation.

Analysis of the 391 posts that students shared during this activity reveals a wide range of subjects. Some of these subjects are about ordinary elements of daily life, community and environment, favorite activities, school work, information about their parents and siblings and their relationships with them, countries they visited and favorite foods. The students were very open to interaction and curious about each other's lives. They wanted to inform the students with whom they were talking and elaborate on the subjects of their conversations. Notice the clear evidence of relationship development displayed in the exchange below: "USA Student 2: My brother is 16. How old is your brother? Turkish Student 1: My brother is 8 years old. He is younger than me. I've got dogs too. I've got 2 dogs. One of my dog [sic] have 3 puppy. They are very sweet I can share their photo maybe. What about your dogs? Can you share their photos?"

The activity clearly enabled students to build trust and respect and it may also have prevented students from approaching each other based on stereotypes, helping them to see each other as individuals. Within a day or two, the American students, who thought that they were interacting with Middle Eastern people, realized that the students with whom they were talking were individuals with families, personal lives and hobbies. They stopped seeing the students at the other school as a group of foreigners and started to see them as individuals. It was certainly the same for Turkish students, too, who may have had stereotypes about American culture.

3.2. Finding common ground through media and popular culture

More than two-thirds of all the social interactions during Lesson 1 focused on the discovery of common ground through shared interests in mass media and popular culture. Posts included information and opinions about American mass media, as students discussed a variety of actors, movies, TV series video games, popular books, music and similar subjects. In these dialogues, many students discovered that they were interested in the same types of popular culture products as the students in the other country. They were excited by the discovery of their common interests in music, fashion, gaming and movies.

Thanks to these dialogues, children realized that although they lived in different parts of the world, they admired the same singers and actors, watched the same movies and TV series and played the same computer games in their free time. They were excited to recognize that popular culture was a kind of common global culture. The informal quality of language and expression used on the social network, plus the amount of conversation about media and popular culture, was somewhat unnerving to Turkish teachers of English language who were unfamiliar with the pedagogy of media literacy education. To illustrate this point, consider this exchange between Turkish and American teens:

- Turkish Student 3: Do you know Mythbusters that show is really good.
- USA Student 4: OMG! That show is amazing!
- USAStudent 6: Yeah I used to watch that show and want to try doing the things they did. It was a little dangerous though.
- Turkish Student 5: Yea, they blow up everything: D
- USA Student 3: Hahahahaha, Do you know the show "Top Gear"?
- Turkish Student 3: Yea, It's an American show, right?
- USA Student 3: It's actually from the UK but there is an American version and lots of other versions although the original one is from the UK
- USA Student 6: No, my parents won't let me :(

During this activity, students developed confidence in expressing their voice by sending posts, interacting and asking questions. While most used grammatically correct English, others used some of the linguistic conventions of text messaging, including emoticons and excessive punctuation in their informal writing. Students discovered that they had valuable knowledge that was of interest to others. In particular, American students were surprised to learn that Turkish students were familiar with their favorite TV shows, videogames, movies and music.

3.3. Conflicting values about popular culture among teachers

Teachers had differing perceptions about the value of Lesson 1, which encouraged children to use social media as an informal sharing opportunity to encounter each other as human beings. Mr. Herbert, from George School, was very happy that his students started to learn about the personal interests of children who were growing up in Turkey. He was pleased that students could activate their out-of-school knowledge about sports, media, music and family life in interacting with Turkish middle-school students through social media. Because students know so little

about daily life in Turkey, Mr. Herbert believed that his students were learning from their Turkish peers to "question the prejudices and stereotypes conveyed by the American mass media" about the people and cultures of the Middle East. At the end of the first week of the activity, he noticed students' attitude shifts during classroom discussion and he focused on the changes he observed in the prejudices of the students. He described how students started to question their knowledge about the Middle East and Turkey.

By contrast, teachers at the Blossom School in Turkey had a different perspective about the value of Lesson 1. Turkish teachers had hoped that the project would be an opportunity to promote Turkish culture and values. For this reason, they were unhappy that in Lesson 1, students were mostly discussing American popular culture. Teachers encouraged their students to talk about elements of the Turkish culture such as traditional Turkish coffee, carpets, food, geography, history and hospitality. Despite these admonitions, the Turkish students kept on posting comments about American mass media and pop culture. In an interview, Mr. Yaman expressed this concern, "In this project, we mainly wanted the students to promote their lifestyle and culture to the American students. I believe that they should focus on Turkish culture, but they mostly talked about American movies and celebrities". One of the Turkish graduate students who helped the Turkish teachers with this project said, "I witnessed that teachers were uncomfortable with students' using social media and creating video, especially when such activity led to the production of popular culture texts that threatened national school-sanctioned curricula and the teachers' authority".

> In the context of this middle-school global learning experience, children had opportunities to share ideas through social media, using online writing, posting of images, and the creation of short films, posters and electronic comic books. We have shown that there is educational value in the informal use of social media with young adolescents, whose in-school use of social media in the context of social studies and foreign language education has not yet been researched widely. For young adolescents, it may be empowering to discover that people from far-off lands have families, pets, friends, and all the ordinary joys, trials and tribulations of growing up.

These findings are aligned with work by Moore (2013) who reports various sources of anxiety among elementary and secondary teachers concerning the inclusion of popular culture in the classroom. Although informal learning in formal educational contexts can be highly valuable, this study illustrates that experiences with using one's voice in a social media network may "shape young people's knowledge construction in unexpected ways", inspiring teachers to "structure informal practices that were not perceived to hold a legitimate place in formal education" (Greenhow & Lewin, 2015: 18).

3.4. Discovering asymmetries in access to media and popular culture

Turkish students were both excited to discover their common interests and disappointed to see that the American students had such limited knowledge about Turkish culture and media. Some Turkish students asked their American peers about their familiarity with particular Turkish actors and musicians. Turkish children were curious if American students were familiar with the best and most famous Turkish movies and TV series. However, they did not get any responses. Because of the historical development, size and scale of the USA media industry, Americans have less access to global popular culture than people from other nations (Crothers, 2013). For example, only seven cities in the United States carry the television network Al Jazeera America (Cassara, 2014).

When the Turkish children were interviewed, many revealed their disappointment that the conversations about popular culture were a "one-way street" with an exclusive focus on American media from Hollywood and Silicon Valley. The asymmetry of knowledge about popular culture was at times frustrating to the Turkish students. For

example, one Turkish student said, "We know about the American TV series, movies and singers. Justin Bieber is very famous and handsome both for them and for us. But there are also singers in our country who are as handsome and talented as Justin Bieber, yet they do not know about them".

Over time, American children also grew more aware of the asymmetry problem, and by the end of the six-week curriculum, both groups had increased their awareness of how some asymmetries in their online relationship that were the result of structural, economic and political differences in the global media system. Mr. Herbert, the American teacher, was supportive of the children's discovery of the problem of asymmetrical access. According to the teacher, for some students, it was a shock to learn that, despite their privileged status as American school children enrolled in a private school, they missed having access to global information and entertainment coming from Turkey. It was an eye-opening experience that introduced children to the intersection of individual and institutional dynamics at work in relation to cultural imperialism (Schiller, 1969) where the pursuit of commercial interests by US-based transnational corporations undermined the cultural autonomy of countries around the world. At the end of the learning experience, one American student wrote, "I learned that the world outside of America is actually pretty similar to ours, and that different people view different things in very different ways. But I noticed that I have no idea about Turkish cultures and life. I learned a lot from this, and it was really great!".

Media globalization has created new kinds of inequalities between nations in relation to media production and global distribution that reflect wider political and economic problems of dependency (Boyd-Barrett, 1998). The rise of media globalization, which emerged at the beginning of the 20th century from the global export of Hollywood film, has now expanded to include music, video games, advertising, merchandising and celebrity culture. We did not expect to find that, as the use of a private online social network empowered student voice, it also enabled students to develop a deeper understanding of the global flows of entertainment and information that shape how cultural products are exchanged and experienced. We did not expect that young people would learn to use their digital voices in interacting with foreign peers by finding common ground in the pleasures of movies, television shows, videogames, and popular music. We did not expect for this practice to be controversial with classroom teachers. Through a close analysis of an activity where young teens interacted informally with each other to find common ground, this study is the first to demonstrate that, through interacting with global peers, even young teenagers can begin to recognize the nature of one-way information flows that are driven by the global media system where USA music, movies and videogames dominate.

4. Discussion and conclusions

The opportunity to talk across the limitations of time and space can be transformative. This paper has offered a case study of a collaboration between teachers in the US and Turkey, where 7th grade students interacted with each other informally via online social media as a means to activate student voice and promote cultural understanding. In the context of this middle-school global learning experience, children had opportunities to share ideas through social media, using online writing, posting of images, and the creation of short films, posters and electronic comic books. We have shown that there is educational value in the informal use of social media with young adolescents, whose in-school use of social media in the context of social studies and foreign language education has not yet been researched widely. For young adolescents, it may be empowering to discover that people from far-off lands have families, pets, friends, and all the ordinary joys, trials and tribulations of growing up. The opportunity to use social media for ordinary conversation –finding common ground– may have benefits that include but go far beyond the mastery of English grammar and usage.

Digital media are useful for crossing borders of all kinds. While students valued the opportunity to develop relationships with each other by sharing their common interests in Hollywood movies, actors, celebrities, videogames and television shows, teachers had widely differing perspectives of the value of this activity. While we anticipated that this project would enable us to explore how middle-school students navigate geographic and cultural borders, this research demonstrates that teacher attitudes about popular culture represent another key fault line that may either support, deepen or limit the value of digital literacy instructional practices, particularly when social media activities are used by students to engage in authentic cross-cultural dialogue. More research will be needed to fully understand the conditions under which students' use of social media to share informal knowledge may inadvertently become a kind of power wedge between students and adults.

This study has implications for the professional development of educators with interests in student voice. When students are able to freely express themselves, they will inevitably reveal their authentic and deeply-felt attachments

to mass media and popular culture. Teachers who may be ambivalent, conflicted or even hostile to popular culture in the classroom and professional development must address this issue in the context of digital learning. For this reason, Hagood, Alvermann and Heron-Hruby (2010) have suggested that teachers who participate in carefully designed long-term professional development programs should become comfortable in integrating popular culture texts into their curricula. According to Alvermann (2012: 218), "that such identity constructions frequently become visible through films, music, rap lyrics, and so on is yet another reason why popular culture texts have a place in a school's curriculum and its classrooms". Of course, there may be valid reasons for why some students may not wish to explore their identities through popular culture texts introduced in the school curriculum, especially if (however well intended), the classroom activities colonize or trivialize young people's interests (Burn, Buckingham, Parry, & Powell, 2010).

But because educators have a love-hate relationship with mass media, popular culture and digital media, these attitudes inevitably come into play when digital technologies are used in education. We recognize the powerful opportunity that cross-cultural projects may play in promoting a reflective stance among teachers, who may discover the particularities of their values through collaborative projects like the one we describe in this paper. It may be that hidden assumptions about the nature of knowledge itself, including the sometimes rigid and hierarchical positioning of "high" and "low" culture, can be revealed through activities that enable students to bring their lived experience of popular culture and daily life into the classroom (Hobbs & Moore, 2013). In the design and development of instructional pedagogies that use social media to promote cross-cultural dialogue, teachers may benefit from structured opportunities to reflect on how their attitudes about mass media and popular culture may shape their curriculum choices and use of digital texts, tools and technologies.

References

Aldridge, J., & Goldman, R. (2007). *Moving toward Transformation: Teaching and Learning in Inclusive Classrooms*. Birmingham, AL: Seacoast Publishing.

Alvermann, D.E. (2012). Is there a Place for Popular Culture in Curriculum and Classroom Instruction? [The Point Position] (Volume 2, pp. 214-220, 227-228). In A.J. Eakle (Ed.), *Curriculum and Instruction*. Thousand Oaks, CA: Sage.

Boyd-Barrett, O. (1998). Media Imperialism Reformulated (pp. 157-177). In D. Thussu (Ed.), *Electronic Empires: Global Media and Local Resistance*. London: Arnold.

Burn, A., Buckingham, D., Parry, B., & Powell, M. (2010). Minding the Gaps: Teachers' Cultures, Students' Cultures (pp. 183-201). In D.E. Alvermann (Ed.), *Adolescents' Online Literacies: Connecting Classrooms, Digital Media, and Popular Culture*. New York: Peter Lang.

Cassara, M. (2014). Al Jazeera Remaps Global News Flows. In S. Robert, P. Fortner, & M. Fackler (Eds.), *The Handbook of Media and Mass Communication Theory.* New York: Wiley Online.

Cikara, M., Bruneau, E., & Saxe, R. (2011). Us and Them: Intergroup Failures of Empathy. *Current Directions in Psychological Science, 20*(3), 149-153.

Coiro, J., Knobel, M., Lankshear, C., & Leu, D.J. (2008). Central Issues in New Literacies and New Literacies Research (pp. 1-22). In J. Coiro, M. Knobel, C. Lankshear, & D.J. Leu. (Eds.), *The Handbook of Research in New Literacies.* Mahwah, NJ: Lawrence Erlbaum.

Crothers, L. (2013). *Globalization and American Popular Culture.* Lanham, MD: Rowman and Littlefield.

Ellet, W. (2007). *The Case Study Handbook*. Boston, MA: Harvard Business School Press.

Gilster, D. (1999). *Digital Literacy.* New York: Wiley.

Greenhow, C., & Lewin, C. (2015). Social Media and Education: Reconceptualizing the Boundaries of Formal and Informal Learning. *Learning, Media and Technology*, 1-25. https://doi.org/10.1080/17439884.2015.1064954

Greenhow, C., Robelia, B., & Hughes, J. (2011). Web 2.0 and Classroom Research: What Path should We take Now? *Educational Researcher, 38*(4), 246-259.

Hagood, M., Alvermann, D.E., & Heron-Hruby, A. (2010). *Bring it to Class: Unpacking Pop Culture in Literacy Learning*. New York: Teachers College Press.

Hill, M. (2013). I*nternational Pen Pals Engaging in a Transformational Early Childhood Project*. Doctoral dissertation, University of Alabama, Birmingham. (http://goo.gl/AdhHc4) (2016-08-01).

Hobbs, R., & Moore, D.C. (2013). *Discovering Media Literacy: Digital Media and Popular Culture in Elementary Schoo*l. Thousand Oaks, CA: Corwin/Sage.

Hobbs, R. (2010). *Digital and Media Literacy: Connecting Classroom and Culture.* Thousand Oaks, CA: Corwin/Sage.

Hobbs, R. (2007). *Reading the Media: Media Literacy in High School English*. New York: Teachers College Press.

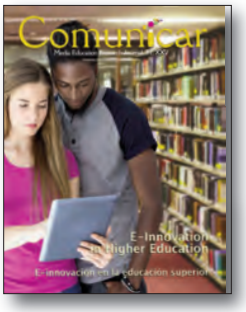
Hobbs, R., Yoon, J., Al-Humaidan, R. Ebrahimi, A., & Cabral, N. (2011a). Online Digital Media in Elementary School. *Journal of Middle East Media, 7*, 1-23.

Hobbs, R., Cabral, N., Ebrahimi, A., Yoon, J., & Al-Humaidan, R. (2011b). Field Based Teacher Education in e-Elementary Media Literacy as a Means to Promote Global Understanding. *Action in Teacher Education, 33*, 144-156.

Hurtado, S. (2005). The Next Generation of Diversity and Intergroup Relations Research. *Journal of Social Issues, 61*(3), 595-610. https://doi.org/10.1111/j.1540-4560.2005.00422.x

Kincheloe, J. (2004). *The Knowledges of Teacher Education: Developing a Critical Complex Epistemology*. Teacher Education Quarterly 31(1), 49-66.
Lee, A., Lau, J., Carbo, T., & Gendina, N. (2012). *Conceptual Relationship of Information Literacy and Media Literacy in Knowledge Societies. World Summit on the Information Society*. UNESCO Media and Information Literacy. (http://bit.ly/1LgJLbL) (2016-09-12).
Merryfield, M. (2002). The Difference a Global Educator can Make. *Educational Leadership 60*(2), 18-21.
Moore, D.C. (2013). Bringing the World to School: Integrating News and Media Literacy in Elementary Classrooms. *Journal of Media Literacy Education 5*(1), 326-336.
Moore, D.C. (2011). Asking Questions First: Navigating Popular Culture and Transgression in an Inquiry-based Media Literacy Classroom. *Action in Teacher Education 33*, 219-230.
National Association for Media Literacy Education (2008). *Core Principles of Media Literacy Education*. (http://goo.gl/alhkrZ) (2015-08-11).
New London Group (1996). A Pedagogy of Multiliteracies: Designing Social Futures. *Harvard Educational Review, 66*, 60-92.
Rheingold, H. (2012). *Net Smart: How to Thrive Online.* New York: Basic.
Schiller, H. (1969). *Mass Communication and American Empire.* New York: M. Kelley Publishers.
Soliya (Ed.) (2014). *What we do*. (www.soliya.net) (2015-08-15).
Stern, S. (2008). Producing Sites, Exploring Identities: Youth Online Authorship. In D. Buckingham (Ed.), *Youth, Identity and Digital Media* (pp. 95-117). J.D. and C.T. MacArthur Foundation Series on Digital Media and Learning. Cambridge, MA: MIT Press.
Stornaiuolo, A., DiZio, J.K., & Helming, E.A. (2013). Expanding Community: Youth, Social Networking and Schools. [Desarrollando la comunidad: jóvenes, redes sociales y escuelas]. *Comunicar, 40*, 79-87. https://doi.org/10.3916/C40-2013-02-08
Tuzel, S. (2012a). *Ilkogretim ikinci kademe Turkce derslerinde medya okuryazarligi: Bir Eylem Arastırmasi*. PhD Dissertation, Unpublished. Canakkale: Canakkale Onsekiz Mart University.
Tuzel, S. (2012b). Integration of Media Literacy Education with Turkish Courses. *Mustafa Kemal University Journal of Social Sciences Institute, 9*(18), 81-96.
Tuzel, S. (2013a). Integrating Multimodal Literacy Instruction into Turkish Language Teacher Education: An Action Research. *Anthropologist 16*(3), 619-630.
Tuzel, S. (2013b). The Analysis of Language Arts Curriculum in England, Canada, the USA and Australia Regarding Media Literacy and their Applicability to Turkish Language Teaching. *Educational Science: Theory & Practice, 13*(4), 2291-2316.
UNESCO. (2013). *Media and Information Literacy: Policy and Strategy Guidelines*. (https://goo.gl/ZPhgWk) (2015-08-11).
Unal, S., & Ozturk, I. (2012). Barriers to ITC Integration into Teachers' Classroom Practices: Lessons from a Case Study on Social Studies Teachers in Turkey. *World Applied Sciences Journal, 18*(7), 939-944.

Comunicar, n. 51, v. XXV, 2017 | Media Education Research Journal | ISSN: 1134-3478; e-ISSN: 1988-3293
www.comunicarjournal.com



The Role of Original Version Cinema into the European Digital Space

El rol del cine en versión original en el espacio digital europeo

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ABSTRACT

This paper reports the results derived from the research project, entitled "eDCINEMA: Towards the European Digital Space. The role of small cinemas in original version" (CSO2012-35784), which focused on the analysis of the role of movies in OV/OVS in achieving diversity of languages and cultures (as viewed from the European Digital Agenda) as well as Community policies on the promotion of small cinemas in the European digital space. The current study is based on a methodological triangulation, a transnational exchange of information between 62 European experts and a multistage organization, which included: a critical review of the scarce essay writing and profuse Community rules, in-depth interviews with international experts and a design and implementation of a prospective Delphi questionnaire. One of the most remarkable research results is summarized as an indicator of the conflict between the clearly demonstrated OV influences to make progress towards achieving the ideal of a real language diversity, and Community-wide application of packages of random measures, which often leads to lack of expected results. Consequently, the study suggests a strategic reorientation of the European Audiovisual Model toward further exploitation of its 24 languages, on the role of vernacular and not just as vehicular languages, and eventually as guarantors in the process of reliable access to cultural and scientific repertoires.

RESUMEN

El presente trabajo pormenoriza los resultados de la investigación «eDCinema: Hacia el espacio digital europeo, el papel de las cinematografías pequeñas en versión original» (CSO2012-35784), orientada al análisis del rol que el cine en VO/VOS desempeña en la consecución de la diversidad lingüística y cultural contemplada en la Agenda Digital Europea, así como del encaje normativo de las cinematografías de pequeñas dimensiones en el espacio digital europeo. La triangulación múltiple del proyecto pivota sobre un planteamiento pluridisciplinar, basado en un intercambio transnacional de conocimientos dimanantes de un panel de 62 expertos europeos, así como en un pautado polietápico que incluye: revisión crítica de la escasa literatura ensayística y de la profusa normativa comunitaria, realización de entrevistas en profundidad a expertos, diseño y aplicación de un cuestionario prospectivo Delphi. Entre los resultados del estudio destaca el hecho paradójico de que, frente a la contrastada relevancia del acceso a contenidos en VO como complemento indispensable de la cohesión cultural europea y de la consecución del ideal de diversidad lingüística, la Unión Europea continúa implementando paquetes de medidas de carácter aleatorio, fragmentario y contingente que, en general, abocan a una sistémica ausencia de resultados. Consecuentemente, se recomienda una reorientación estratégica del modelo audiovisual europeo a la explotación de sus 24 lenguas, en su condición vernácula y no solo vehicular, como garantes del acceso fidedigno a vastos repertorios culturales o científicos.

KEYWORDS | PALABRAS CLAVE

Small cinemas, European convergence, original version, cultural diversity, digital society, audiovisual creation, cultural industry, critical vision.
Pequeñas cinematografías, convergencia europea, versión original, diversidad cultural, sociedad digital, creación audiovisual, industria cultural, visión crítica.

Received: 2016-05-28 | Reviewed: 2016-06-22 | Accepted: 2016-12-09 | Preprint: 2017-02-15 | Published: 2017-04-01
DOI: https://doi.org/10.3916/C51-2017-07 | Pages: 73-81

1. Introduction and state of the question

There have been numerous commitments by the UE and its member states to preserving and promoting cultural and linguistic diversity in Europe, in which cinema plays a key role as a paradigm of convergence between technological innovation, the economy and "cultural capital" formulated by Bordieu (2005). The "European Charter for Regional or Minority Languages" (ECRML) approved by the European Council on 25 June 1992 and adopted by UNESCO in 1996 committed its signatories in article 12b "to give priority to the variety of access media in other languages to works produced in regional or minority languages, thus enabling and developing the activities of translation, dubbing and post-synchronization and subtitling" (EC, 1992).

This was the context for the research project "eDCINEMA: Towards the European Digital Space. The role of small movie theatres in original version cinema" (CSO2012-35784), undertaken between 2013-2015 by the Grupo de Estudos Audiovisuais at the University of Santiago de Compostela, financed through the Ministry of Economy and Competiveness' National R+D+i Plan.

Most of the research developed around neuroscience enables us to isolate empirical evidence of the extent of the diffusion of cinematographic content in original version (OV) within linguistic and cultural education. Vez, Muñoz and Llinares (2011: 2-3), in their report "Promotion of the Original Version in the diffusion of audiovisual content. Contributions from research on linguistic education", state that linguistic diversity should not be circumscribed by the regulated educational system because of the latter's obvious limitations in terms of the appropriation of foreign languages in contexts of effective interculturality. This appropriation is, a priori, supportive in nature and can only later become expressive.

Access to audiovisual content in OV thus becomes an indispensable part of the configuration of "an open space for civic culture in which a profile develops of a citizenry that is more socially cohesive and which shares a concept of communication that can better attend to the empathetic, diversifying and socio-cultural aspects that must form part (…) of the metacommunicative conscience of those who aspire to be competent plural European citizens" (Vez, Muñoz, & Llinares, 2011: 3). This reflection is based on two principles:

- The narrative structure adapts ideally to the cognitive activation processes.
- The audiovisual incident in its original conception, that is, made in the language in which it was conceived, unequivocally recreates models of situations that mobilize in the receiver the three constituent cognitive processes of empathetic learning: to activate, construct and integrate.

The viewer becomes a subject who experiences situations of mediated linguistic immersion in which he/she intuitively and autonomously appropriates cultural and linguistic meanings through these three processes. Numerous key authors –Kuppens (2010), Sundqvist & Sylvén (2014), Collins & Muñoz (2016), etc.– state that, at the level of understanding, audiovisual content shows greater effectivity and dynamism than the proverbial academic resources of linguistic teaching-learning.

In terms of the broad regulatory framework available, the "eDCINEMA" investigation has primarily focused on the European Digital Agenda (EDA) and the Creative Europe 2014-2020 plan, both as a main documentary source and as a partial study approach. The material documents a short-term integral development model with an economic-industrial focus that will eventually determine the European socio-cultural model to be adopted. We have designed some of the core objectives of our research around the following plan:

- The analysis of the situation, based on EC policy, of small cinemas in terms of their volume of production, the scale of the local market and the vehicular languages (Hjort & Petrie, 2007).
- The taxonomy of incentives authorized for European cinema produced in non-hegemonic languages and their showing in OV/SOV, within the cultural diversity considered in the EDA.
- The identification of actions aimed at fostering visibility and accessibility to productions from small cinematographic frameworks in the European digital audiovisual space.
- The relevance of showing films in OV/SOV to achieve the cultural and linguistic diversity as envisaged by the EDA.

The approach to these objectives requires placing the EDA in its context (EC, 2014) in relation to the antecedents of this new digital project directed at the "cultural citizen" (León, 2009). In 2007, the European Commission, in its commitment to stimulate media literacy, proposed an "Agenda" as a guideline to the Community approach towards culture, based on a proposal in which technological innovation should be in the service of knowledge of the European audiovisual heritage and cultural identities. At the same time, media lite-

racy in the educational setting would enhance the connection to creative digital content (EC, 2009: 10).

Continuous learning constituted the necessary counterpart in this symbiotic approach of culture and digital innovation: this was seconded by the two other institutional standard bearers of the European Union, the European Parliament and the European Council, when defining as key competences "those which all people need for their personal development in order to be active citizens, for social inclusion and employment" (EP, 2006: 13), as well as emphasising communication in one's mother tongue and in foreign languages, digital competence and cultural and awareness and expression.

These EU proposals led to initiatives in Spain by the Institute of Cinematography and Audiovisual Arts (ICAA) and the Ministry of Education's Office of the Secretary of State for Education and Vocational Training, which set up a Committee of Experts in July 2011. One of the main conclusions of the committee was the need to promote access to audiovisual works in original version as a key objective of all cultural and political education, to bring the audience into contact with diversity, neutralizing the false appropriation of a homogenous reality that consists of characters, referential universes and undifferentiated social profiles, and at the same time modifying the social habit of majority access to dubbed audiovisual content (Committee of Experts, 2011:3). A difficult objective to achieve if one considers that, in the six years prior to the establishment of the committee, the average number of SOV films was around 30% of all the movies shown in cinemas, yet the average number of viewers of SOV films barely reached 3% of all cinema goers, as the following Table 1 shows.

Based on the ICAA data, the Committee of Experts proposed stimulating demand for, and increasing the number of, films shown in OV, and it urged Spain's Senate to incorporate all the country's official languages in subtitling, which the Senate duly approved on 12 July 2011, recommending that the government take steps to give effect to the policy.

The committee also recommended greater coordination between all competent authorities in formulating public funding systems to digitalize movie theatres to better accommodate works in OV, and to halt the trend for cinemas in rural areas to disappear (Committee of Experts, 2011: 9).

The reflections and arguments presented by this committee are praiseworthy for their clarity, accuracy and feasibility compared to the work of certain European institutions: the committee warns of a clear structural threat in the deterioration of the cultural fabric of society resulting from the erosion of cinematographic and linguistic pathways.

2. Material and methods

The complexity of the contemporary socio-cultural environment in general, and the intricacy of certain study subjects in particular, lead research groups to undertake broad and inclusive transdisciplinary approaches, often based on multiple triangulations –data-based, investigative, theoretical and methodological– that are stratified in nature. This is the case of our project: a multidisciplinary proposal based on an exchange of knowledge arising from the critical revision of the literature and regulations, broadened and contrasted by qualitative and quantitative con-

Table 1. Figures for cinemas showing films in SOV (source: ICAA)

Number of cinemas	4,401	4,299	4,296	4,140	4,082	4,080
Cinemas showing OV films with Spanish subtitles: 200 days/year	87	86	94	115	112	108
Cinemas showing OV films with Spanish subtitles: 150 days/year	111	107	112	127	128	125
% cinemas showing OV films on a regular basis (150 days)	2.52%	2.49%	2.61%	3.07%	3.14%	3.06%
Number of films shown (Titles)	1,730	1,748	1,776	1,652	1,481	1,555
Films in OV with Spanish subtitles	531	583	441	499	462	439
% SOV films	30.69%	33.35%	24.83%	30.21%	31.20%	28.23%
Total number of viewers	127,651,225	121,654,481	116,930,692	107,813,259	109,986,858	101,589,517
Total number of SOV viewers	3,219,740	3,055,219	2,058,076	4,150,441	5,361,536	3,370,860
% of SOV viewers	2.52%	2.51%	1.76%	3.85%	4.87%	3.31%

tributions from an "initial population" –later constituted as a "Panel"– of 62 European experts resident in minority language areas of the EU –Catalonia (6.45%), the Basque Country (14.52%), Galicia (24.19%), Valencia (3.22%), Scotland (1.61%), Wales (3.22%), Finland (4.83%), France (3.22,%), Holland (6.45%), Italy (1.61%) and Portugal (1.61%)–, segmented in four profiles of competence –«Academic" (37.10%), "Institutional" (24.19%), "Cultural Manager" (22.58%) and "Creator" (16.13%)– and which envisages in-depth interviews of elites and prospective Delphi questionnaires.

The Figure below shows the stratification of our research in four successive and complementary phases.

As the Figure shows, only after a critical and exhaustive review of the literature, regulations and reports, as well as conducting the Forum of Experts to provide meeting points and spaces for reflection for the main agents involved, was it feasible to select the population of experts for the interviews and design the interview which, in line with the methodology of the so-called "interviews of elites", was subject to modification by the interviewees themselves in their role as experts on the theme of this research. Given that this type of interview can generate an amount of potentially irrelevant information greater than in other types of interview, Ruiz-Olabuénaga (2007) recommends using "interview guides".

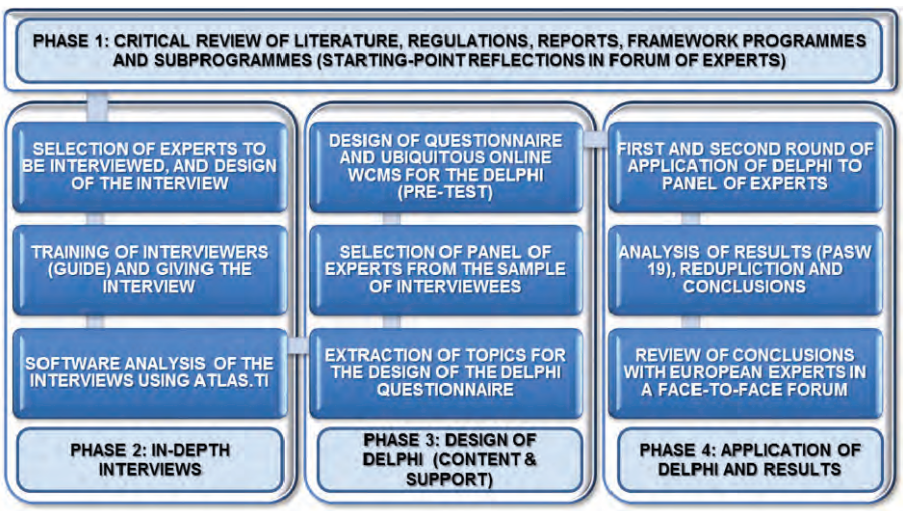


Figure 1. Summary of the project's flow in stages.

When the interviews were finished, the considerable content they had yielded was analysed using the ATLAS.ti qualitative data analysis software for the isolation and taxonomy of a series of fundamental topics that could be used in a second phase for the prospective Delphi questionnaire. For the design of this survey we consulted earlier studies (Pazos & Ruiz 2008; Mohedano, 2013; San-Eugenio, Fernández, & Jiménez, 2013).

The questionnaire was applied in successive rounds to a "Panel of Experts" selected from the specialists interviewed, based on their particular competence and the proactivity shown during the development of the in-depth interview phase. In order to make best use of the limited space available, we will not present an overview of the interview questionnaires and Delphi here as these will be examined in depth later under "Analysis and Results" and "Discussion and Conclusions".

We used two types of specialist software for data extraction and management depending on the qualitative or quantitative nature of the analysis (see Table 2).

An overview of the regulations studied in this investigation is important for understanding the role of cinema in achieving linguistic diversity and the extracurricular acquisition or consolidation of key competences in minority languages. We are referring to EDA / Europa 2020, a nodal, prospective European Community project that has generated several other documents that have also been analysed here. In addition, the intensive documental analysis methodology derived from the application of controlled hermeneutics by inference –in the style of López (2002), Bardin (2013: 15-29), Krippendorf (2013) and Chevrier (2009: 53-87), provided a more accurate valuation of the incidence of the audiovisual narrative in the very diversity of language and culture (Ledo & Castelló, 2013).

In the EDA framework, we can see how the role apportioned to "Language Technologies" in the Information and Communication Technologies (ICT) programme (EC, 204:14) is significant, with a clear socio-economic objective: the consolidation of a single European digital market accessible to all citizens. In this context, connectivity

Table 2. Type, usage, features and advantages of the software packages for data extraction and management

Software	Usage	Characteristics	Advantages
IBM SPSS (PASW) Statistics 19	For predictive analysis and quantitative data management	Proven potential for data management, systematic analysis, generation of reports, management of algorithms, detection and correction of errors or lost values.	Outstanding ergonomics for data searching and management thanks to automatic adaptation to PASW syntax of open source program languages like R and Python.
ATLAS.ti 7.5.11 Qualitative Data Analysis	For qualitative analysis of sets of text, video and graphics	Broad multilinguistic support, intuitive generation of analyses based on primitive epistemological relations and recovery of data with Boolean, semantic and proximate operators.	The latest versions optimize the hierarchization of the analysis material, "conceptual map" construction and interaction with other languages such as SPSS, HTML, XML, CSV, Oracle, MySQL...

via fast cheap broadband for European citizenry is increasingly in demand, as documented in the report by the Committee on Industry, Research and Energy (CIRE, 2010) which emphasises:

- The vindication of a Digital Society that is inclusive, based on accessibility to technology by competent users.
- The taking into account of the vital role of the Creative and Cultural Industries (CCI) in the configuration of a single market for creative content, with the CCI involved in the cultural and linguistic specificities.
- The promotion of "the virtuous 2015.eu spiral" which, under the auspices of Zen Business, aims to replace the traditional linearity of the value chain with a synergic effect in the creation of value shared among its actors (Coll, 2015).
- The consideration of "digital literacy" as essential for social integration, in line with Aguaded (2011: 8).
- The reinforcing of school learning via ICT innovations, especially related to early exposure to foreign languages, both being effective operatives in the service of cohesion.

3. Analysis and results

The role of cinema in the European digital project is set out in a recent EDA report that the Committee of Culture and Education (CCE) presented to the European Parliament (CCE, 2015). The report cites the European film industry, with 1,500 films released in 2014, as one of the most productive worldwide, although it acknowledges that its financing model makes the structure of this output extremely irregular (CCE, 2015: 5), which undermines its performance as an "industry" and as "European". The report also notes the paradox that, despite the undoubted quality, originality and diversity of productions, European cinema attracts only small audiences and is not widely distributed inside or outside the EU, and is incapable of providing a real alternative to strong international competition (CCE, 2015: 5).

Thus, it is of immediate importance to emphasise the cinematographic diversity and cultural and linguistic plurality of Europe as one of its main strengths, by guaranteeing its funding through institutional actions such as the MEDIA sub-programme, which provides financial support for the development of film production and distribution, with over half the general budget of the Creative Europe Program, some 1.5 million euros for 2014-2020 (CCE, 2015: 15).

In terms of the specific effect which the European development model praised by the EDA has had on political action undertaken by EU Member States in general, and on the Spanish multicultural, multilinguistic context in particular, the Council of Ministers approved the "Digital Agenda for Spain" on 15 February 2013. The strategy for political action on ICT, Electronic Government and the Information Society for 2013-2015 was shaped by the notion that the "Information Society" concept, as opposed to the term "Digital Society" coined by the European Community for its socio-cultural project, was outdated (Medialab, 2016).

The government, under the aegis of the Ministries of Industry, Energy and Tourism, Taxation and Public Administration, articulated the question of Spain's linguistic diversity in its "Plan for the Promotion of Language Technologies". It emphasised the development of linguistic infrastructures in Spanish and other official languages geared to the achievement of linguistic processors and resources considered indispensable for the development of the national industry for the Processing of Natural Language (PNL) and Automatic Translation (AT), with direct repercussions on film subtitling.

The Office of the Secretary of State for Telecommunications and the Information Society (SETSI in Spanish), which is responsible for coordinating and implementing the Digital Agenda for Spain, helps "Language

Technologies" gather momentum: the PLN and AT act as processors that transcend text analysis and subsequent exploitation in computer applications (Language Technology Promotion Plan – PITL in Spanish, 2015: 11) in order to monitor reputations on social networks, create alerts, assist in the online learning of foreign languages and automate translation and text correction processes, mainly in the field of "grey literature" (SETSI, 2015: 6-7).

SETSI gives less prominence to AT restricting its business model to the commercialization of the services provided by the autonomous public administrations, mainly in via SaaS, "Software as a service", paid for by users-clients on demand (SETSI, 2015: 112).

After studying the European Community regulations, we now turn to the vast array of documentation consulted with our panel of European experts. The system used consisted of synthesising the topics extracted from a critical review of the literature and in-depth interviews with experts into a prospective online Delphi questionnaire which, following an exhaustive pre-test phase, was applied to a Panel of Experts.

The data from the Delphi methodology were converted into a battery of retrospective, contemporary and prospective consensuses and disagreements around the topics put to the Panel, accompanied by the degree of concurrence reached among the panellists. With adjustments for appropriate clarifications, the Table 3 sets out the contributions from the panellists and their greatest degree of concurrence, with a highly homogenous degree of distribution.

To conclude this section, methodological rigor obliges us to review those topics which, although widely cited in the reference texts and in the in-depth interviews –and if not, might not have been included in the Delphi questionnaire–, triggered major discrepancies among the panellists. The question whether "screen quotas should be imposed for the daily showing of 50% of European films in OV" caused most controversy, for although the most selected option was "Disagree" (27.59%), the sum of the various options –overlapping in the Likert scale or the "evaluation methods summary"– that refute the statement and those that subscribe to it show similar scores (37.93%).

4. Discussion and conclusions

In our reflection on the European Community, we sense a clear aspiration to worldwide cultural leadership (Mattelart, 2006), with the potential for cultural penetration and positioning of the medium of cinema. While this aspiration is undoubtedly legitimate, it is currently unreachable since European filmmakers spend barely 1% of a film's production budget on promoting and commercializing the product, whereas in the USA they tend to spend as much on promotion as on production. Hence the uncomfortable fact that European films are shown almost exclusively in their countries of origin and not beyond (CCE, 2015: 14).

What is more, support for the subtitled film genre by MEDIA inexplicably trails off when compared to the dubbed version, which appears to be a clear brake on the evolution of the treatment of cultural diversity in the European digital space, as well as the acquisition and consolidation of key competences in minority languages through cinema in original version. We can see how one of the potential strengths of European cinema becomes, once again due to faulty political strategy, one of its main weaknesses:

- Potential strength: in a European context of generalized digitalization, one would expect the European Community to fully support the promotion of subtitled multilingual cinema, emphasising those technologically and creatively innovative experiences which, always in the pursuit of quality subtitling and of its integration in cinematographic works, enable the viewer to benefit from the contributions to partial subtitling by O'Sullivan (2008), to creative subtitling by McClarty (2012), or even the universal design applied to media accessibility by Udo and Fels (2009).
- Real weakness: instead, the EU has opted for a participatory financial model to fund subtitling, namely, crowdsourcing, and there is a preparatory action underway (CCE, 2015: 7) that could possibly exclude MEDIA from all or part of the subsidy for European film subtitling. The aim would be to set up an online platform to attract funding for the translation of audiovisual subtitles (CCE, 2015: 17), which would lead the European Council to neglect its public duty by leaving to chance, in the form of voluntary contributions by individuals, compliance with the commitments set out the ECRML.

In Spain, the government aims to lead the multilingual experience of its four official languages (SETSI, 2015: 8) by reducing the distance that separates their linguistic infrastructures with regard to English, in terms of quantity, quality and availability of resources (PITL, 2015: 20). However, as in the case of Europe, it is only the idiosyncrasy of Spanish industry that could come up with the principle for such leadership: the high costs of production of the linguistic resources for each application domain means they are unaffordable for the small- and medium-sized

Table 3. Themes and topics with the greatest degree of concurrence and with a highly homogenous distribution		
Theme	**Topics formulated by the Panellists**	**Concurrence**
Specific policies	It is essential to recognize and protect identity in cinema as European intangible cultural heritage.	86.21%
	The Community principle of linguistic plurality is not clearly defined in strategies aimed at achieving this goal.	81.48%
	Barriers to access to cinematographic diversity in cinemas reveal the vulnerability of the European cultural identity.	83.33%
	The generalization of films in OV/SOV in cinemas would contribute to linguistic diversity in Europe.	90.00%
Diffusion	European public broadcasters must consolidate and increase the number of European films shown in OV/SOV.	96.67%
	Although public television stations are one of the main broadcasters of films in vernacular languages…	79.31%
	…they have not achieved the objective of distributing the films made in the language of their own autonomous community to other countries.	74.08%
	The EDA must promote the creation of digital platforms to offer the public this type of cinema.	93.34%
	Cooperation between cinemas, festivals, universities and film libraries would improve their broadcasting potential and their reception by the public.	90.00%
Dubbing and subtitling	The prevalence of dubbing is the first obstacle to the acceptance of vernacular language films.	90.00%
	The generalization of OV will lead to greater linguistic diversity in Europe.	93.10%
	An intensive education in linguistic diversity would further infants' familiarization with films in OV.	90.00%
	One of the obstacles to the generalization of subtitling is the competition between TV channels for greater audience share.	85.71%
European digital space	Cinema websites play a decisive role in capturing new audiences for identity-based films.	86.67%
	UER/FORTA will generate an online platform for European cinema à la carte, managing the Internet distribution rights.	83.20%
	The proliferation of digital film distribution networks has contributed significantly to the increased visibility of identity in cinema.	73.08%

companies that are the real operational and dynamic agents of the sector.

In addition, the reports by Gartner (2015) alert to the general lack of awareness of this type of application, and such is the shortage of demand that Spanish companies in the sector find manacled to almost pre-industrial ways of working: small-scale, between 1 and 10 workers, a lack of awareness in the sector or of partnership structures, etc.

We have seen that this apparent sense of drift in pursuit of language technologies clearly highlights the strategic fault at the heart of the proposal of the Digital Agenda for Spain: if film businesses find unacceptable the conditions that encumber non-hegemonic linguistic raw material, it is precisely the cultural perspective that must be confronted first instead of being passed over by, or even deleted from, the institutional discourse.

Put another way, if it is their very condition as non-hegemonic languages that relegates their respective technological PNL and AT markets to almost mute expression, only by the extent to which such languages can benefit from their vernacular, and not just vehicular, condition as a guarantee of real access to vast cultural and scientific repertories will they be able to position themselves in the transnational market of automatic translation and independent language text processing, the economic forecast for which is set to rise in their sector of the business, from the current 12 billion € to 30 billion € in 2020 (PITL, 2015: 12).

This is, therefore, a strategic sector for the EU and its 24 official languages some of which are in "critical danger" of digital extinction. Hence the management of multilingualism in the Single European Digital Market is a priority objective for the "Connecting Europe Facility" (CEF) whose array of digital public services includes tools for accessing linguistic resources in various European languages (SETSI, 2015: 9). Likewise, reformulating political action in Spain with regard to language technologies must be done without delay, in line with increasing European concern about the Gordian knot which, for the Single European Digital Market, is linguistic diversity (SETSI, 2015: 19), even if not clearly stated in EU texts aimed at its citizens.

However, there is hope at hand in that the Spanish government' proverbial quietism on the subject will be somewhat ameliorated by the actions of regional autonomous institutions that will gain strength by joining their respective cultural heritages to linguistic reality, transcending merely instrumental considerations. In this regard, SETSI (2015: 56) draws attention to three reference centres:

• The Centre for Terminology in the Catalan Language (TERMCAT: www.termcat.cat): created in 1985 by the Generalitat (autonomous Catalan government) and the Institut d'Estudis Catalans, its mission is to integrate Catalan terminology via numerous tools and linguistic resources, both in specialist sectors and among society at large.

• The Basque Centre of Terminology and Lexicography (UZEI: www.uzei.eus/es): in operation for over 35 years, it has become a compulsory point of reference in the field of research and development of language technologies thanks to the development of PNL tools through its euLEZ project.

• The Galician Language Institute (ILG: http://ilg.usc.es/es/recursos): attached to the University of Santiago de Compostela in collaboration with the Real Galician Academy, the ILG develops specialist scholarly resources in the field of the Galician language with a solid base in language technologies.

As a corollary of the contributions and reflections aired so far, we present the most important conclusions of our study:

• Access to OV content is an indispensable complement to European social cohesion and the achievement of the ideal of linguistic diversity, as it transcends the logical limitations of the regulated educational system in its proposition of intercultural contexts that are effective for the appropriation of foreign languages.

• That said, and although some actions to preserve the European Intangible Cultural Heritage are praiseworthy in their attempt to promote the subtitling of audiovisual content, the clear formal commitment of the Conventions (ECRML) usually ends up as batteries of random, fragmentary and contingent measures whose outcome is a systematic lack of results.

• Together with the proposals sent to the European Parliament by the Committee for Culture and Education (CCE, 2015), we draw attention to the urgent need to redirect European strategies for commercialization towards disruptive models that contemplate audiences' cultural specificities by boosting subtitling as a guarantee of transnational circulation and of the projection of the linguistic and cultural diversity of Europe (Marzal, 2003).

• Likewise, in line with the calls from our experts, we cite the need for coordinated action among European institutions and policies to protect identity in cinema as European intangible cultural heritage by promoting its dissemination in cinemas, on television, digital platforms, at festivals, universities and film libraries.

• Priority should be given to funding the production and distribution of audiovisual works in their respective vernacular languages, not to dubbing, in order to familiarize the general public, especially children, with films in OV/SOV as a guarantee of mutual understanding at European level.

• The European audiovisual model must redirect its exploitation strategies regarding the EU's 24 languages by focusing on the vernacular, not just the vehicular, as a guarantee of authentic access to huge cultural and scientific repertoires, taking the Danish example as best practice (López, Castelló & Arias, 2015).

As a corollary of this work, we acknowledge that the main limitation of this study in terms of the universalization of the results is the number of interviewees, those surveyed, and the countries involved. This does not? Prevent us from considering our research as a point of reference in its field in terms of methodology, content and results, with the hope that future investigations will deepen and broaden the exploration of our study subject.

References

Aguaded, I. (2011). Media Education: An International Unstoppable Phenomenon. [La educación mediática, un movimiento internacional imparable]. *Comunicar, 37*, 7-8. https://doi.org/10.3916/C37-2011-01-01

Bardin, L. (2013). *L'analyse de contenu*. Paris: Presses Universitaires de France.

Bourdieu, P. (2005). *Capital cultural, escuela y espacio social*. México: Siglo XXI.

Coll, J.M. (2015). *Zen Business: Los beneficios de aplicar la armonía en la empresa*. Barcelona: Profit.

Collins, L., & Muñoz, C. (2016). The Foreign Language Classroom: Current Perspectives and Future Considerations. *The Modern Language Journal, 100*, 133-147. https://doi.org/10.1111/modl.12305

Comisión de Expertos para el Fomento de la Versión Original en la Exhibición de Obras Audiovisuales (2011). *Conclusiones, propuestas y recomendaciones*. Madrid: Ministerio de Cultura y Ministerio de Educación (http://goo.gl/jgujgR) (2015-01-11).

Committee on Culture and Education/CCE (2015). *On European Film in the Digital Era. Report.* (http://goo.gl/8DLzly) (2015-02-20).

Committee on Industry, Research and Energy/CIRE (2010). *On a New Digital Agenda for Europe: 2015.eu. Report.* (http://goo.gl/5DymP7) (2015-02-20).

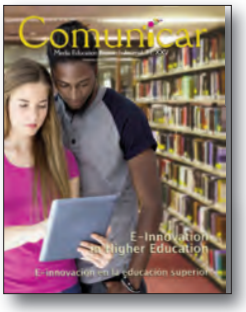
Chevrier, J. (2009). La spécification de la problématique. In B. Gauthier (Dir.), *Recherche sociale: De la Problématique à la Collecte des Données* (pp. 51-84). Sainte Foy: Presse de l'Université du Québec.

European Commission (1992). *European Charter for Regional or Minority Languages*. Strasbourg: Official Journal of the European Union (http://goo.gl/HbDBHY) (2015-01-27).

European Commission (2009). *Commission Recommendation of 20 August 2009 on Media Literacy in the Digital Environment for a More*

Competitive Audiovisual and Content Industry and an Inclusive Knowledge Society. Brussels: Official Journal of the European Union (http://goo.gl/6mCkka) (2015-03-15).
European Commission (2014). *The EU Explained: Digital Agenda for Europe.* Luxembourg: Publications Office of the European Union. https://doi.org/10.2775/41229
European Parliament & Council (2006). *Recommendation of the European Parliament and of the Council of 18 December 2006 on Key Competences for Lifelong Learning*. Brussels: Official Journal of the European Union (http://goo.gl/EuX6Wg) (2015-03-15).
Gartner (2015). *Text Analytics 2015*. Report. (goo.gl/0VqVX9) (2016-01-27).
Gobierno de España (2013). *Agenda Digital para España*. (https://goo.gl/n5h1ai) (2015-01-30).
Hjort, M., & Petrie, D. (Eds.) (2007). *The Cinema of Small Nations.* Edinburgh: Edinburgh University Press.
Krippendorf, K. (2013). *Content Analysis: An Introducing to its Methodology*. Beverly Hills: Sage Publications.
Kuppens, A.H. (2010). Incidental Foreign Language Acquisition from Media Exposure. *Learning, Media and Technology, 35*, 1, 65-85. https://dx.doi.org/10.1080/17439880903561876
López-Noguero, F. (2002). El análisis de contenido como método de investigación. *XXI, 4*, 167-179 (http://goo.gl/udmUae) (2015-01-15).
López-Gómez, A.M., Castelló-Mayo, E., & Arias-Iglesias, I. (2015). Las cinematografías minoritarias y minorizadas en la política cultural de la Unión Europea: la alternativa danesa. *Fonseca, 11*(11), 32-59 (http://goo.gl/Heg76r) (2016-04-20).
Ledo-Andión, M., & Castelló-Mayo, E. (2013). Cultural Diversity across the Networks: The Case of National Cinema [La diversidad cultural a través de la Red: el caso del cine identitario]. *Comunicar, 20*(40), 183-191. https://doi.org/10.3916/C40-2013-03-09
León, G. (2009). Comunicación y ciudadanía cultural: la migración como práctica de comunicación, *Razón y Palabra*, *66*. (https://goo.gl/xFISSt) (2015-08-15).
Marzal, J.J. (2003). Atrapar la emoción: Hollywood y el Grupo Dogma 95 ante el cine digital. *Arbor, 686*, 373-389. https://doi.org/10.3989/arbor.2003.i686.646
Mattelart, A. (2006). *Diversidad cultural y mundialización*. Barcelona: Paidós.
McClarty, R. (2012). Towards a Multidisciplinary Approach in Creative Subtitling. *Monographs in Translating and Interpreting (MonTI)*, *4*, 133-153. https://doi.org/10.6035/MonTI.2012.4.6
Medialab (Ed.) (2016). *Sociedad digital. Líneas estratégicas*. Universidad de Granada. (http://goo.gl/NR0jxJ) (2016-04-01).
Mohedano, F.O. (2013). El método Delphi, prospectiva en Ciencias Sociales a través del análisis de un caso práctico. *EAN*, *64*, 31-54 (http://goo.gl/qJo4mu) (2015-12-20).
O'Sullivan, C. (2008). Multilingualism at the Multiplex: A New Audience for Screen Translation? *Linguistica Antverpiensia*, *6*, 81-97 (https://goo.gl/qiFLly) (2016-02-17).
Pazos, A.J.B., & Ruiz, B.C. (2008). Las revistas profesionales especializadas en publicidad en España: resultados de un estudio Delphi. *Doxa Comunicación*, *7*, 59-81 (http://goo.gl/fC2j6I) (2015-12-03),
Ruiz-Olabuénaga, J.I. (2007). *Metodología de la investigación cualitativa*. Bilbao: Universidad de Deusto.
San-Eugenio, J., Fernández, J., & Jiménez M. (2013). Características y funciones para marcas de lugar a partir de un método Delphi. *Revista Latina de Comunicación Social*, 656-675. https://doi.org/10.4185/RLCS-2013-995
SETSI (2015). *Informe sobre el estado de las tecnologías del lenguaje en España dentro de la Agenda Digital para España*. (https://goo.gl/Uh9Oy8) (2015-12-23).
SETSI (2015). *Plan de Impulso de las Tecnologías del Lenguaje (PITL)*. (https://goo.gl/iikEjH) (2015-11-01).
Sinclair, J., & Cunningham, S. (2000). Go with the Flow: Diasporas and the Media. *Television & New Media*, *1*, 11-31. https://doi.org/10.1177/152747640000100102
Sundqvist, P., & Sylven, L.K. (2014). Language-related Computer Use: Focus on Young L2 English Learners in Sweden. *ReCALL*, *26*, 3-20. https://doi.org/10.1017/S0958344013000232
Udo, J.P., & Fels, D. (2009). The Rogue Poster Children of Universal Design: Closed Captioning and Audio Description. *Ted Rogers School of Information Technology Management Publications and Research*, *Paper 18*, 1-32. (http://goo.gl/L3PPBr) (2016-03-21).
Unesco (1996). *Universal Declaration of Linguistic Rights.* (https://goo.gl/aUSyv7) (2015-06-15).
Vez, J.M., Muñoz, C., & Llinares, A. (2011). *Fomento de la versión original en la difusión de contenidos audiovisuales. Aportaciones desde las investigaciones en educación lingüística*. *Informe.* (https://goo.gl/pBeZtH) (2015-05-16).

Comunicar, n. 51, v. XXV, 2017 | Media Education Research Journal | ISSN: 1134-3478; e-ISSN: 1988-3293
www.comunicarjournal.com



Spanish Journalists' Perception about their Professional Roles

La percepción de los periodistas españoles acerca de sus roles profesionales

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ABSTRACT

International empirical research on the perception that journalists have of their professional roles and functions has increased considerably in recent years, although not in the case of Spain. The present research, included within the transnational comparative study "The Worlds of Journalism Study", analyses data from a survey conducted in Spain (representative and stratified by type of media and autonomous community) of 390 journalists from 117 media, who were consulted about their work to detect the professional functions they most identified with. The study establishes six roles: watchdog, citizens´ spokesperson, instructor of the audience, promoter of the status quo, infotainment journalist and disseminator of objective information. In line with recent political, economic and social developments in Spain, professionals feel more identified with the role of citizens´ spokesperson. This function downplays the predominant role of disseminator of objective information reflected in recent studies of a similar nature on the subject of Spanish journalists. A further finding of the research is the existence of two large groups of journalists: the stimulators and the "narcotizers" of public opinion. Moreover, it is observed that some organizational factors (in particular, media ownership) and other individual ones (gender, age and years of professional experience) significantly influence the perceptions of professional roles.

RESUMEN

La investigación empírica internacional sobre la percepción que los periodistas tienen de sus roles y funciones profesionales presenta un notable auge en los últimos años, aunque no en el caso español. Esta investigación, que forma parte del estudio comparativo transnacional «Worlds of Journalism Study», analiza los datos de una encuesta realizada en España (representativa y estratificada por tipo de medio y por Comunidad Autónoma) a 390 periodistas de 117 medios de comunicación, quienes fueron consultados sobre su trabajo para detectar las funciones profesionales con las que más se identificaban. El estudio señala seis roles: el de perro guardián, el altavoz de la ciudadanía, el instructor de la audiencia, el favorecedor del statu quo, el que entretiene a la opinión pública y el difusor de información objetiva. En línea con la evolución política, económica y social de los últimos años en España, los profesionales se identifican más con el papel de altavoz de la ciudadanía. Esta función desplaza en importancia al rol protagonista de los estudios similares más recientes sobre periodistas españoles: el de difusor de la información objetiva. Se hallan también dos grandes grupos de periodistas: los estimuladores y los narcotizadores de la opinión pública. Además, se observa que algunos factores organizacionales (en concreto, la propiedad del medio) y otros individuales (el género, la edad y los años de experiencia laboral) influyen significativamente en las percepciones de los roles profesionales.

KEYWORDS | PALABRAS CLAVE

Journalism, professional roles, professional attitudes, media, information, quantitative analysis, survey.
Periodismo, roles profesionales, actitudes profesionales, medios de comunicación, información, análisis cuantitativo, encuesta.

Received: 2016-09-28 | Reviewed: 2016-10-25 | Accepted: 2016-12-02 | Preprint: 2017-02-15 | Published: 2017-04-01
DOI http://dx.doi.org/10.3916/C51-2017-08 | Pages: 83-92

1. Introduction and current status

Empirical research on the attitudes and professional roles of journalists has achieved academic recognition. The studies of Cohen (1963), Nimmo (1964), Dunn (1969), Chittick (1970), Johnstone and others (1972), and Janowitz (1975) are pioneers in this field. Spanish academic interest on this matter, although incipient (especially regarding empirical studies with representative samples on a national scale), has increased steadily since the 90s and, more relevantly, since the year 2000 (Canel & Sánchez-Aranda, 1999; Canel & al., 2000; Hanitzsch, 2011, from the survey conducted by Berganza & al., 2010; Gómez-Mompart & al., 2015). The turn of the century has witnessed a rise in the empirical study of professional journalistic attitudes conducted in different Spanish regions (Humanes, 1998, in the Community of Madrid; Martín & Amurrio, 2003, in the Basque Country; and Túñez & Martínez, 2014, in Galicia).

There has also been an increase in international comparative studies in this area of research (Weaver, 1998; Hanitzsch, 2011; Weaver & Willnat, 2012; Willnat & al., 2013; Mellado & al., 2016) which contributes to the consolidation of the subject under study. The present work falls within this last category, developed within the international project The Worlds of Journalism Study (WJS) together with 66 other participating countries, sharing the same methodology. This article will only analyze Spanish data, cross-checking it with the roles identified in relevant, previous empirical investigations.

Thus, among the most remarkable empirical research on the professional roles of journalists, it is worth highlighting the study by Johnstone and others (1972) who conducted a survey of 1300 journalists to evaluate the relevance of eight functions. Its subsequent analysis confirmed the existence of two types of journalistic roles the majority of participants identified with: neutral, a mere spectator of the social process who transmits verified and objective information and facts; and participant, a more active role which investigates, contextualizes and interprets news. Another notable contribution of this work is the finding that 75% of the people surveyed firmly supported the monitoring function of government activities, described by the authors as "watchdog", which would later become a category in its own right (Johnstone & al., 1972).

In a similar vein, a few years later, Janowitz (1975) identified these same journalistic roles, although he labelled them differently. On one hand, this author refers to "gatekeepers" (whose characteristics are consistent with those of the neutral role described by Johnstone & al., 1972). The second category is "advocates", similar in characteristics to the participant journalist of Johnston and others (1972).

Weaver and Wilhoit (1986), on the other hand, proposed a third additional role to the previously mentioned (neutral and participant, which they termed disseminator and interpreter, respectively): the "adversarial" or "adversary" (which would correspond to the watchdog function of Johnstone & al., 1972), used to describe journalists who exercise this function towards the government and political and economic interests, by adopting a distant and mistrustful attitude. According to Coronel (2008), this role differs across countries and cultures as it adapts to the different information models, in the understanding that journalists cover political corruption, sex and financial scandals, and all types of irregularities (Coronel, 2008: 2).

Weaver & Wilhoit (1996), in a later study, suggested an additional professional category: the "populist mobilizer" or mobilizer of citizens, who perceives him- or herself as a transmitter of citizens´ opinions, provides entertainment and promotes the audience´s cultural interests. Nevertheless, a further contribution of this investigation establishes the roles of disseminator and interpreter as the cornerstones of the profession, and the interpretation of information as a fundamental function. Conversely, the role of "adversary" or critic would have a lower presence, as indicated in their previous study.

Additionally, Mellado (2011) identifies five roles: two in common with previous investigations (the monitor or "watchdog", and the disseminator or neutral) and three new ones. Thus, he describes the "citizen-oriented" role or advisor of citizens as journalists who provide information necessary to understand reality and make political decisions. On the other hand, the propagandist offers a positive image of political and economic leaders, and supports public policies. Finally, the "consumer-oriented" role or consumption advisor provides information of general interest concerning what people want to know; that is, bearing in mind public requirements.

More recently, Mellado and collaborators (2016) conducted a transnational comparative to determine the predominant journalistic functions in the Latin American media context. Based on the content analysis of 18 newspapers, they established the presence of six roles, some of which had already been identified (Table 3) in previous investigations: interventionist, watchdog, loyal facilitator, service-oriented, infotainment and, finally, civic (Mellado & al. 2016).

Hanitzsch (2011) indicates the existence of four professional roles, including three previously mentioned. The first, "populist disseminator", refers to journalists who share a clear citizen-oriented function and tend to provide interesting information in order to attract the largest possible audience. The second, "detached watchdog", describes an impartial monitoring function where journalists are aware of their social responsibilities as impartial observers and remain sceptical and critical towards the political and economic elites. The third role is related to the advocate or citizen advisor: the "critical change agent" also has a monitoring attitude towards the political and economic elites but is a lot more interventionist. The fourth role emerging from this study by Hanitzsch (2011) is the "opportunist facilitator", a type of journalist who supports official policies and is close to the elites.

Spanish empirical research in this field of study first appeared in the late 90s. Thus, Canel and Sánchez-Aranda (1999) determine four types of professional attitudes: the disseminator or neutral role describes but doesn´t analyze; the interpreter or participant role analyses information; the adversary or "watchdog" is mistrustful of official information and critical towards politicians; and the new role of advocate perceives him- or herself as a guide, leader or educator of the public. Other contemporary studies reveal new journalistic functions. According to Gómez-Mompart (1999), these functions have changed so that journalists have become communicators, entertainers as opposed to informers, and mediators instead of intermediaries. These findings are supported by a study conducted in the year 2000 and commissioned by the Catalan School of Journalists, in which Catalan professionals declared that their priority was to entertain and then inform (Humanes, 2003).

> The contributions of this investigation allow us to state that the perception of Spanish journalists regarding their function in society is evolving in parallel to political, economic and social developments. This article adds to existing literature by providing six types of professional roles, a modest advance on previous empirical studies on journalistic perceptions conducted in Spain. (...) Three classic roles have been identified: the disseminator; the adversary or watchdog; and the advocate, which would correspond to the instructor of the audience. This work detects three further roles: citizens´ spokesperson, the infotainment journalist and the promoter of the status quo.

In 2014, Túñez and Martínez (2014: 44) focused on Galician journalists to conclude that what companies valued most was the speed with which they developed their duties, and what they valued least was the ability to analyze information as well as journalists having their own list of contacts. Gómez-Mompart and collaborators (2015: 144) also conducted an investigation on the perception of Spanish journalists regarding the quality of contents, based on the theories of "gatekeeping" and "newsmaking". This online survey of 363 journalists is one of the latest research studies conducted in Spain to take into account the technological transformation brought about by the digitization of media.

On the basis of the most relevant research published on the subject, we set the following research questions:

• RQ1: Which professional roles emerge from the answers given by journalists when asked about the functions they develop?

• RQ2: Are there differences regarding the importance journalists give to each of the identified professional roles?

• RQ3: Is there any type of association between the detected professional roles?

As established in previous literature, some organizational factors (such as type and ownership of the medium) and other individual ones (gender, age and years of professional experience) significantly influence the perception of professional roles. In this respect, Canel and Sánchez Aranda (1999) include both types of factors; Johnstone

and others (1972), age and experience; and Hanitzsch (2011), gender, age and experience. The present investigation examines these organizational and individual factors. Therefore, we formulate the following hypothesis:

• H1: Differences are established between journalists regarding their perception of the professional roles taking into account individual variables such as: gender, age and years of professional experience; and organizational variables, such as ownership of the medium in which they work and type of medium (traditional vs. digital).

2. Material and methods

2.1. Sample

The survey of 390 Spanish journalists was conducted within the context of the international project The Worlds of Journalism Study (WJS). The design of the sample followed three phases: cluster, stratified and simple random sampling.

Thus, a media list was initially created based on the report by the APM (Press Association of Madrid, 2013) and the Agenda de la Comunicación (Communication Agenda of the Spanish government), with the aim of conducting a first cluster sampling, taking the medium as an aggregated sampling unit. In total, 26 digital and 91 traditional media were selected (newspapers, agencies, TV and magazines); these were stratified in turn by autonomous community and size (large or small). Five journalists were selected randomly for each large organization and three for each small organization in order to complete the final sample of 390 professionals (n=89 of online media; n=301 of traditional media). The result is a probability sample, intended to be representative of the universe of journalists of the country. The sample size was calculated with a 95% confidence and a 5% error, taking as reference the estimated population (n=18,000) in 2014 (Berganza, Herrero, & Carratalá, 2014: 31).

Finally, the interviews were carried out by telephone by a survey team, previously trained to this effect, between the 1st of March 2014 and the 30th of May 2015.

2.2. Measures

Taking as a starting point the survey in tandem with the rest of WJS researchers, of which we are a part, a scale of 21 items was analyzed. The items were related to the importance that journalists give to a series of functions specific to the profession. The answer options for each item followed a Likert-type scale, where: 5=extremely important, 4=very important, 3=more or less important, 2=not very important and 1=not at all important. With a view to reducing the dimensions of this scale, the 21 items were subjected to an Exploratory Factor Analysis (EFA) in order to observe the journalistic roles that underpinned the data.

As can be observed in Table 1, each of the 21 incorporated items presents significant weight in one of the six factors suggested by the EFA as latent structure (explained variance=59.46%, KMO=.77; Bartlett´s test: $p<.001$). The internal consistency of each factor, or construct, measured with Cronbach´s Alpha, showed adequate reliability, as a general rule, in each of the identified journalistic roles[1], and respected the minimum value recommended for exploratory studies: .60 (Hair & al., 1999; Robinson & al., 1991).

3. Analysis and results

3.1. Analysis

All conducted surveys were anonymized and subsequently coded using the statistical package SPSS (Statistical Package for the Social Sciences, version 22). An index was calculated for each professional role based on the average of the items that composed it, detected in the EFA (Table 1); and these indicators were in turn used to carry out relevant descriptive and inferential analyses, as shown below.

3.2. Results

After treatment of the data extracted from the 390 surveys, we can establish six types of professional roles (RQ1), shown in the Table below together with the specific functions that comprise them and ordered according to the importance they are given by the journalists:

Additionally, and after conducting a repeated measures analysis of variances, it can be observed that the differences between the roles (RQ2) are statistically significant [$\lambda W=.187$; $F(5, 382)=332.55$; $p<.001$; $\eta 2=.813$]. In particular, and in view of the data shown in Table 2, the role of acting as a citizens´ spokesperson has the highest mean ($M_{role2}=4.40$; $SD=.62$); while promoting the status quo is given the least importance by journalists ($M_{role4}=2.54$; $SD=.81$); at the same time, the differences between them are statistically significant [$t(387)=36.75$; $p<.001$].

Table 1. Dimensions of professional roles through EFA with varimax rotation and reliability test

PROFESSIONAL ROLES Specific Functions	"Watchdog" (role 1)	Citizens' spokesperson (role 2)	Instructor of the audience (role 3)	Promoter of the status quo (role 4)	Infotainment journalist (role 5)	Disseminator of objective information (role 6)
Monitor/control political leaders	.88					
Monitor/control economic elites	.87					
Establish political agenda	.61					
Be an adversary of the government	.48					
Provide current affairs analysis	.42					
Promote social change	.41					
Promote tolerance and cultural diversity		.79				
Enable people to express their point of view		.69				
Tell stories about the world		.66				
Educate the audience			.68			
Orientate and advise the audience about their daily lives			.66			
Provide citizens with the necessary information to make political decisions			.59			
Motivate people to participate in civic activities and political discussions			.56			
Support government policies				.80		
Offer a positive image of political and economic leaders				.75		
Support national development				.53		
Provide the type of news that attracts the largest number of people possible					.65	
Influence public opinion					.57	
Offer entertainment and leisure					.48	
Be an impartial observer						.77
Report events as they are						.66
Eigen Value	4.56	2.73	1.75	1.20	1.15	1.06
Explained variance	21.75	13.02	8.37	5.74	5.49	5.08
Cronbach´s Alpha (α)	.75	.63	.66	.64	.55	.31

(α). Note: the analyses include values >.40.

Therefore, the role of citizens´ spokesperson is the one that journalists identify most with in Spain. This role is characterized by the promotion of tolerance and cultural diversity (89.9% of respondents find it extremely or very important), enabling people to express their point of view (88.4%) and telling stories about the real world (82.6%). It is directly linked to the role described by Weaver & Wilhoit (1996) as the populist mobilizer or, more recently, by Mellado and others (2016) when referring to the civic function of journalists. However, this is the first time this role has been identified in Spain, which represents an original contribution that can be used as a starting point for future research.

The role of citizens´ spokesperson replaces in importance, although closely, the predominant role found in recent studies on the perceptions of Spanish journalists: that of disseminator of objective information. The functions that comprise this role would be to report events as they really are (96.9%) and act as an impartial observer of reality (70.3%).

Another fundamental role of journalists, cited in the previous scientific bibliography (Weaver & Wilhoit, 1996; Canel & Sánchez-Aranda, 1999; Hanitzsch, 2011; Mellado, 2011), is that of "watchdog", structured around the following functions: provide analysis of current affairs (87.9%), monitor and control political leaders (79.2%) and the economic elites (77.7%), promote social change (69.5%), establish the political agenda (37%) and act as an adversary of the government (18.1%). The watchdog emerges, again, as a prototypical professional attitude of modern journalism, put into practice to defend citizens´ interests and to alert to the possible abuses of those in power (Casero-Ripollés, 2012).

The role of instructor of the audience (previously indicated by Canel & Sánchez-Aranda, 1999; Hanitzsch, 2011; Mellado, 2011) is fourth in importance for Spanish journalists and involves the following aspects: provide citizens with the necessary information to make political decisions (72.4%); motivate people to participate in civic

Table 2. Mean and standard deviation of each of the journalistic roles, together with the specific functions that comprise them				
PROFESSIONAL ROLES and specific functions that comprise them	**N**	**M**	**SD**	**% say extremely important**
Role 1. "Watchdog"	390	3.70	.69	
Provide current affairs analysis	389	4.38	.76	87.9
Monitor/control political leaders	385	4.17	1.04	79.2
Monitor/control economic elites	386	4.14	1.08	77.7
Promote social change	387	3.90	1.04	69.5
Establish political agenda	387	3.13	1.13	37.0
Be an adversary of the government	381	2.45	1.20	18.1
Role 2. Citizens´ spokesperson	390	4.40	.62	
Promote tolerance and cultural diversity	386	4.52	.76	89.9
Enable people to express their point of view	389	4.46	.76	88.4
Tell stories about the world	385	4.24	.90	82.6
Role 3. Instructor of the audience	390	3.54	.78	
Provide citizens with the necessary information to make political decisions	387	3.97	1.09	72.4
Motivate people to participate in civic activities and political discussions	389	3.71	1.04	60.9
Educate the audience	385	3.35	1.19	46.2
Orientate and advise the audience about their daily lives	387	3.12	1.12	38.0
Role 4. Promoter of the status quo	388	2.54	.81	
Support national development	385	3.60	1.17	56.1
Support government policies	382	2.15	1.05	9.4
Offer a positive image of political and economic leaders	386	1.85	.92	3.4
Role 5. Infotainment journalist	389	3.19	.83	
Influence public opinion	387	3.50	1.09	52.2
Offer entertainment and leisure	388	3.13	1.15	40.7
Provide the type of news that attracts the largest number of people possible	389	2.95	1.20	33.4
Role 6. Disseminator of objective information	390	4.35	.62	
Report events as they are	390	4.79	.55	96.9
Be an impartial observer	390	3.92	1.00	70.3

activities and political discussions (60.9%); educate the audience (46.2%); and, finally, orientate and advise citizens about their daily lives (38%).

The penultimate role is the infotainment journalist, which integrates the following functions: influence public opinion (52.2%), offer entertainment and leisure (40.7%) and provide a type of news that attracts the largest possible audience (33.4%). As suggested by Mellado and others (2016), this would be the role of "infotainer" of the public; promoting, at the same time, a distinct spectacularization of information (Kapuściński, 2002) typical of an era where this represents a merchandise conditioned by the laws of the market.

Finally, the function of "opportunist facilitator" proposed by Hanitzsch (2011) corresponds to the promoter of the status quo, and integrates functions such as: support national development (56.1%) and government policies (9.4%), and offer a positive image of political and economic leaders (3.4%).

As can be observed in Table 3, these six roles have already appeared in similar investigations and are, therefore, consistent with previous scientific literature.

On the other hand, and to measure the degree of association between the six detected roles (RQ3), the following correlation matrix has been developed:

Based on the data contained in Table 4, the highest correlation is produced between the role of watchdog and instructing the audience [r (388)=.406; p<.001]. We can also see that instructing the audience is related to the role of citizens´ spokesperson [r (388)=.382; p<.001]; while the roles of watchdog and citizens´ spokesperson are also considerably linked [r (388)=.327; p<.001]. In the same way, there is a significant association between promoting the status quo and entertaining public opinion r (388)=.397; p<.001]; a fact which suggests two very distinct groups of journalists.

Table 3. List of roles suggested in different investigations							
Johnstone and others (1972)	Janowitz (1975)	Weaver & Wilhoit (1986; 1996)	Canel & Sánchez-Aranda(1999)	Hanitzsch (2011)	Mellado (2011)	Mellado and others (2016)	Berganza and others (findings of this study)
Neutral	Gatekeeper	Disseminator	Disseminator	Populist disseminator	Disseminator		Disseminator
Participant	Advocate of a cause	Interpreter	Interpreter			Interventionist	
		Adversary	Adversary	Detached watchdog	Watchdog	Watchdog	Watchdog
		Populist mobilizer				Civic	Citizens´ spokesperson
			Advocate	Critical change agent	Citizen-oriented	Service-oriented	Instructor of the audience
					Consumer-oriented	Infotainment	Entertainer of public opinion
					Propagandist		
				Opportunist facilitator		Loyal facilitator	Promoter of the status quo

Finally, on the basis of previous empirical evidence, we have assumed that there would be differences in journalists´ perception of roles depending on individual and organizational variables (H1).

Regarding gender, the role that shows the most significant differences is that of promoting the status quo [t (386)=3.80; p<.001], with women (M=2.72; SD=.82) giving higher relevance to this function than men (M=2.41; SD=.78). Significant differences also arise regarding the role of "watchdog" [t (388)=2.02; p=.044], with women (M=3.78; SD=.69) again scoring higher than men (M=3.64; SD=.69). The rest of roles don´t present differences based on gender.

With regard to age[2], we have detected significant differences in the role of promoter of the status quo [F(2, 384)=4.33; p=.014; η2=.022], with younger journalists (M=2.72; SD=.76) considering this function more important than adult (M=2.44; SD=.79) and senior (M=2.47; SD=.86) journalists.

Another individual characteristic taken into account was the years of professional experience[3]. Here, the role which showed higher differences between the groups was the promoter of the status quo [F(2, 385)=3.24; p=.04; η2=.022], so that beginners (M=2.69; SD=.80) tended to prioritize this function when compared with those initiated in the profession (M=2.44; SD=.76) and experts (M=2.49; SD=.86). Another role which showed differences was the disseminator of objective information [F (2, 387)=3.19; p=.042; η2=.004], since experts (M=4.45; SD=.55) give more weight to this function than beginners (M=4.25; SD=.69) and initiated journalists (M=4.34; SD=.63). In fact, there is a positive and statistically significant correlation between the years of experience and the role of disseminator [r (388)=.125, p=.013], evidencing that as the number of years of professional experience increases, so does the priority given to acting as an objective informer of reality.

The type of media ownership, public or private, showed significant differences regarding the role of "watchdog" [t (388)=4.24; p<.001], since journalists working for private media assume this function as more important (M=3.76; SD=.75) than public media journalists (M=3.35; SD=.81). In the same way, the situation was repeated in relation to entertaining public opinion, so that private media journalists consider this aspect of their work more relevant (M=3.25; SD=.80) than their public counterparts (M=2.87; SD=.91).

Table 4. Correlation matrix between professional roles (Pearson´s r)						
	Role 1. "Watchdog"	Role 2. Citizens´ spokesperson	Role 3. Instruct the audience	Role 4. Promote the status quo	Role 5. Infotainment journalist	Role 6. Disseminate objective information
Role 1. "Watchdog"		.327***	.406***	.251***	.169**	.117*
Role 2. Citizens´ spokesperson	.327***		.382***	.062	.149**	.080
Role 3. Instruct the audience	.406***	.382***		.307***	.325***	.089+
Role 4. Promote the status quo	.251***	.062	.307***		.397***	.022
Role 5. Infotainment journalist	.169**	.149**	.325***	.397***		.008
Role 6. Disseminate objective information	.117*	.080	.089+	.022	.008	

+p<.10; *p<.05; **p<.01; ***p<.001

Finally, the data confirm that there are no statistically significant differences concerning the nature of the medium (digital vs. traditional) in any of the six detected professional roles. Therefore, we can assert that both types of media have the same view of their professional functions.

4. Discussion and conclusions

The contributions of this investigation allow us to state that the perception of Spanish journalists regarding their function in society is evolving in parallel to political, economic and social developments. This article adds to existing literature by providing six types of professional roles, a modest advance on previous empirical studies on journalistic perceptions conducted in Spain. Coinciding with other authors (Canel & Sánchez-Aranda, 1999; Canel & al., 2000; Hanitzsch, 2011), three classic roles have been identified: the disseminator; the adversary or watchdog; and the advocate, which would correspond to the instructor of the audience (Table 3). This work detects three further roles: citizens´ spokesperson, the infotainment journalist and the promoter of the status quo.

Spanish professionals identify most with the role of citizens´ spokesperson. This can be explained by Spain´s recent political and economic developments, brought about by a financial and institutional crisis. The characteristics of this role are closely connected with a type of social journalism (described in the style manual of Servimedia[4] Agency) which calls for equal conditions for all sectors of society against political and economic actors, since the usual behavior of media provides a scenario where citizens are not given equal opportunity to express their points of view (Rodríguez-Borges, 2011). This function, as indicated in preceding paragraphs, promotes tolerance and cultural diversity, and enables people to express their point of view and tell stories about the real world. It is directly linked to the concept defined by Weaver & Wilhoit (1996) as the populist mobilizer or, more recently, by Mellado and others (2016) when referring to the civic function of journalists, which mainly involves covering the demands of citizens, their rights and duties. However, it is the first time in Spain that this role is empirically identified in a study on journalistic perceptions, which represents an original contribution that may serve as a starting point for future investigations.

The role of citizens´ spokesperson replaces in importance, although closely, the predominant role found in recent studies on Spanish journalists: that of disseminator of objective information (in line with the traditional roles referred to in the first research studies on the subject by Johnstone & al., 1972; Janowitz, 1975). Research conducted since the late 90s established that the Spanish journalistic profession was widely committed to the disseminating function (Canel & Sánchez-Aranda, 1999: 158; Martín & Amurrio, 2003: 2; Hanitzsch, 2011: 487).

On the basis of the association produced between certain functions, we can affirm that there are two large groups of journalists. On one hand, those that perceive their functions and work as stimulating or active from a political and social point of view (by monitoring the powerful or encouraging and instructing the audience); and, on the other, those who favour the ruling powers, taming or "narcotizing" public opinion, in line with the dysfunction indicated by Lazarsfeld and Merton (1977). The functions most valued by Spanish journalists belong to the first group.

Some individual and organizational variables have significant influence on journalists´ perceptions of their professional functions. Variables of an individual type are especially relevant, although both types should be researched more thoroughly in the future. With regard to gender, the roles of promoter of the status quo and "watchdog" show an imbalance in favour of women. In relation to age and years of professional experience, it is young journalists and those who have fewer years of experience who prioritize the function of promoting the status quo. On the other hand, journalists who have more experience attach greater value to disseminating information in the most objective possible way, consistent with the findings of the pioneering study by Johnstone and others (1972).

Notes

[1] It should be clarified that one of the identified roles, disseminating objective information, had low reliability ($\alpha c = .31$). However, and since this role is considered important in previous scientific literature, we have thought it reasonable to assume this methodological limitation in favour of greater theoretical robustness.

[2] The variable age has been measured in number of years of the journalists and, subsequently, recoded into a different variable termed age groups. The recoding consisted in calculating the 33rd and 66th percentiles of the original variable in order to establish 3 homogeneous age groups: young (22 to 34 years, n=126), adults (35 to 44 years, n=133) and seniors (45 to 74 years, n=130).

[3] The variable professional experience, in the same way as age, has been measured in number of years and, subsequently, recoded into a different variable termed groups of journalists, depending on the professional experience. The recoding consisted in, again, calculating the 33rd

and 66th percentiles of the original variable in order to establish 3 analogous professional groups: beginners (1 to 11 years, n=129), initiated (12 to 19 years, n=132) and experts (20 to 55 years, n=129).

[4] For more information, please consult the following link: http://www.servimedia.es/LibroEstilo.pdf.

Funding agency

The present work was conducted within the framework of the international project The Worlds of Journalism Study (WJS, www.worldsofjournalism.org), funded by the University of Munich (Germany) and supplemented by funds from the Project of the Ministry of Economy and Competitiveness CSO2013-44874-R).

References

APM (2013). *Informe anual de la profesión periodística, 2013*. Madrid: Asociación de la Prensa de Madrid.

Berganza, R., Oller, M., & Meier, K. (2010). Los roles periodísticos y la objetividad en el periodismo político escrito suizo y español. *Revista Latina de Comunicación Social*, *65*, 488-502. https://doi.org/10.4185/RLCS-65-2010-914-488-502

Berganza, R., Herrero, B., & Carratalá, A. (2016). La (des)confianza de los periodistas españoles hacia las instituciones públicas a partir del estudio de factores organizacionales. *Disertaciones, 9*(1), 24-43. https://doi.org/10.12804/disertaciones.09.01.2016.02

Canel, M.J., & Sánchez-Aranda, J.J. (1999). La influencia de las actitudes profesionales del periodista español en las noticias. *Anàlisi*, *23*, 151-170. (http://goo.gl/fRv4lK) (2016-07-25).

Canel, M.J., Rodríguez-Andrés, R., & Sánchez-Aranda, J.J. (2000). *Periodistas al descubierto. Retrato de los profesionales de la información*. Madrid: CIS.

Casero-Ripollés, A. (2012). *El periodismo político en España: algunas características definitorias. Periodismo político en España: concepciones, tensiones y elecciones.* La Laguna: SLCS.

Chittick, W.O. (1970). *State Department, Press and Pressure Groups: A Role Analysis.* New York: Wiley-Interscience.

Cohen, B.C. (1963). *The Press and Foreign Policy.* New Jersey: Priceton University Press.

Coronel, S.S. (2008). *Corruption and the Watchdog Role of the News Media. The Media as Watchdog,* Harvard.

Dunn, D.D. (1969). *Public Officials and the Press.* Pennsylvania: Addison-Wesley.

Gómez-Mompart, J.L. (1999). Transformaciones socio-comunicativas del periodista en la España democrática. In C. Barreda (Ed.), *Del gacetero al profesional del periodismo: evolución histórica de los actores humanos del cuarto poder* (pp. 209-220). Madrid: Fragua.

Gómez-Mompart, J.L., Gutiérrez-Lozano, J.F., & Palau-Sampio, D. (2015). Spanish Journalists and the Loss of News Quality: Professional Judgements. [Los periodistas españoles y la pérdida de la calidad de la información: el juicio profesional]. *Comunicar, 23*(45), 143-150. http://dx.doi.org/10.3916/C45-2015-15

Hair, J., Anderson, R., Tatham, R., & Black, W. (1999). *Análisis multivariante (5th Ed.)*. Madrid: Prentice Hall International.

Hanitzsch, T. (2011). Populist Disseminators, Detached Watchdogs, Critical Change Agents and Opportunist Facilitators Professional Milieus, the Journalistic Field and Autonomy. In *18 Countries. International Communication Gazette, 73*(6), 477-494. https://doi.org/10.1177/1748048511412279

Humanes, M.L. (1998). La profesión periodística en España. *Zer, 3*(4), 265-278. (http://goo.gl/5YV3g2) (2016-07-15).

Humanes, M.L. (2003). Evolución de roles y actitudes. Cultura y modelos profesionales del periodismo. *Telos, 54*. (http://goo.gl/2Q7yAf) (2016-08-01).

Janowitz, M. (1975). Professional Models in Journalism: The Gatekeeper and the Advocate. *Journalism and Mass Communication Quarterly, 52*(4), 618-626. https://doi.org/10.1177/107769907505200402

Johnstone, J.W., Slawski, E.J., & Bowman, W.W. (1972). The Professional Values of American Newsmen. *Public Opinion Quarterly, 36*(4), 522-540. https://doi.org/10.1086/268036

Lazarsfeld, P., & Merton, R.K. (1977). Comunicación de masas, gusto popular y acción social organizada. In H. Musaro (Comp.), *La comunicación de masas.* Buenos Aires: Centro Editor de América Latina.

Martín, R.M., & Amurrio, M. (2003). ¿Para qué sirven los periodistas? Percepciones de los y las profesionales de radio y televisión de la CAPV. *Zer, 8*(14), 11-27. (http://goo.gl/6VCiV3) (2016-08-05).

Mellado, C. (2011). Efectos individuales y organizacionales en el periodismo chileno: Un análisis multinivel de la concepción de roles profesionales. *Comunicación y Sociedad*, *24*(2), 269-304. (http://goo.gl/Z3n5zX) (2016-07-26).

Mellado, C., Márquez-Ramírez, M., Mick, J., Alonso, M.O., & Olivera, D. (2016). Journalistic Performance in Latin America: A Comparative Study of Professional Roles in News Content. *Journalism, 1-20*. https://doi.org/10.1177/1464884916657509

Nimmo, D.D. (1964). *Newsgathering in Washington*. New York: Atherton.

Robinson, J.P., Shaver, P.R., & Wrightsman, L.S. (1991). *Measures of Personality and Social Psychological Attitudes.* San Diego: Academic Press.

Rodríguez-Borges, R.F. (2011). Esfera pública y medios de comunicación. La contribución de los media a la construcción de la ciudadanía democrática. *Daímon, 4*, 79-93. (http://goo.gl/3t3WFx) (2016-08-25).

Túñez, M., & Martínez, M.Y. (2014). Análisis del impacto de la función, las actitudes y las condiciones laborales del periodista en la producción de noticias: Hacia un periodismo de empresa. *Zer, 19*(36), 37-54. (http://goo.gl/MygNrT) (2016-07-22).

Weaver, D.H. (1998). *The Global Journalist: News People around the World.* Cresskill: Hampton Press.

Weaver, D.H., & Wilhoit, G.C. (1986). *The American Journalism*. Bloomington: Indiana University Press.

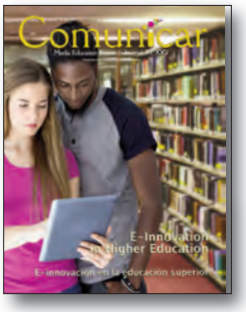
Weaver, D.H., & Wilhoit, G.C. (1996). *The American Journalist in the 1990s: US News People at the End of an Era*. Mahwah: Lawrence Erlbaum.

Weaver, D.H., & Willnat, L. (2012). *The Global Journalist in the 21st Century*. New York: Routledge.

Weaver, D.H., Bean, R., Brownlee, B., Voakes, P., & Wilhoit, C. (2007). *The American Journalist in the 21st Century: USA News People at the Dawn of a New Millennium*. Mahwah: Lawrence Erlbaum.

Willnat, L., Weaver, D.H., & Choi, J. (2013). The Global Journalist in the Twenty-first Century: A Cross-national Study of Journalistic Competencies. *Journalism Practice*, *7*(2), 163-183. https://doi.org/10.1080/17512786.2012.753210

Comunicar, n. 51, v. XXV, 2017 | Media Education Research Journal | ISSN: 1134-3478; e-ISSN: 1988-3293
www.comunicarjournal.com



Stop-motion to Foster Digital Literacy in Elementary School

Stop-motion para la alfabetización digital en Educación Primaria

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ABSTRACT

Although digital media literacy is recognized as providing the essential competencies required for living in a new media age, it has only just started to gain focus just starts to gain focus in Taiwan's elementary education. One of the reasons is examination-oriented education, which diverts scarce resources away from this informal learning. The other reason is that educators tend to think of digital media education as a series of purely technical operations, which might lead student digital media learning to mindless work. Therefore, this study designed a media exhibition based on Kolb's experiential learning model for teaching students concepts of stop-motion films and techniques of film production. A design experiment involved 247 third-grade elementary students who were grouped to visit the experiential exhibition. The findings suggest that the students have improved their knowledge of stop-motion films. Analysis of produced films by students also shows that they have improved their media ability to represent their ideas and communicate with others. Through the analysis of the influence of demographics on the knowledge test, the findings revealed that the experiential exhibition is more effective for female elementary students and students' relevant previous experiences may not affect their acquired knowledge. Given those results and observations, we believe that the proposed experiential exhibition is a promising way to carry out digital media literacy education in elementary schools.

RESUMEN

Aunque los medios digitales se reconocen como proveedores de las competencias esenciales requeridas para vivir en la nueva era mediática, en la educación obligatoria de Taiwan todavía están comenzando a ganar relevancia. Una de las razones para esta situación es la educación centrada en un sistema de evaluación, cuyo resultado directo se refleja en los escasos recursos dedicados a este tipo de aprendizaje informal. Otro motivo importante es que los docentes tienden a pensar en la educación mediática como una serie de operaciones puramente técnicas, lo que podría implicar que el aprendizaje en medios digitales de los estudiantes no tiene mucho sentido. Por lo tanto, este estudio diseñó una exposición mediática basada en el modelo de aprendizaje experiencial de Kolb para enseñar a los alumnos el concepto de las películas stop-motion y sus técnicas de producción. El estudio experimental involucró a 247 alumnos de tercer curso de primaria organizados en grupos para participar en la exhibición experiencial. Los resultados sugieren que los estudiantes han mejorado su conocimiento de las películas stop-motion. Además, el análisis de las películas producidas por ellos mismos muestra una mejora en sus habilidades mediáticas para representar sus ideas y comunicarse. Por otro lado, el análisis comparativo de variables demográficas revela una mayor eficiencia entre las alumnas con respecto a los alumnos, además, los conocimientos previos del alumnado no influyen en la adquisición de conocimientos. Dados estos resultados y según las observaciones, concluimos que la exhibición experiencial propuesta es una vía prometedora para el fomento de la alfabetización digital entre los alumnos de Educación Primaria.

KEYWORDS | PALABRAS CLAVE

Digital literacy, media literacy, elementary education, experiential learning, stop-motion films.
Alfabetización digital, educacion mediática, Educación Primaria, aprendizaje experiencial, películas stop-motion.

Received: 2016-09-08 | Reviewed: 2016-10-10 | Accepted: 2016-12-05 | Preprint: 2017-02-15 | Published: 2017-04-01
DOI: https://doi.org/10.3916/C51-2017-09 | Pages: 93-102

1. Introduction

Digital media literacy focuses on the ability to access, analyze, or produce media messages in non-written modes afforded by media communication technologies such as films, video games, online and mobile media, which differs from traditional media literacy (Dezuanni, 2015). Recently, digital media literacy is beginning to be recognized as one dimension of the essential competencies required for living in a new media age (Jenson, Dahya, & Fisher, 2014). Thus, it is necessary to implement digital media literacy in K-12 education because the aims of media education are also the most important ones of traditional education.

Media educators believe that media production is essential for digital media literacy education because it emphasizes students as media makers, allowing them to be more effective media analysts (Dezuanni, 2015), and that production promotes social and cultural participation (Hobbs, 2004; Jenson & al., 2014). Cheung (2005); Hobbs (2004) further noted that students' participation in media production using video cameras or computers could permit a sense of satisfaction when they are engaged in creative, imaginative and aesthetic activities. Therefore, allowing children to participate in media production has now become an invaluable mode of learning just as it is necessary for them to learn to write as well as to read, supplanting the traditional didactic teaching (Frechette, 2002).

Digital media production education has been around for quite some time in the occidental countries, but has only just started to gain acceptance in oriental countries (Cheung, 2009; Ramirez-Garcia & Gonzalez-Fernandez, 2016), particularly in Taiwan (Chang & Liu, 2011). Moreover, in the university, most of the curriculum about media education for young children in primary schools is specifically provided, and remains marginal and is excluded from the formal education (Lopez & Aguaded, 2015). It is thus necessary to utilize theories and methodological approaches that strengthen young people's digital media production skills in Taiwan.

However, the primary media education in Taiwan encounters two main challenges. The one issue is that primary students commonly acquire media education through attending the exhibitions or workshops outside the school. In addition, schools tend to cut field trips because of financial pressures and examination-oriented education (Greene, Kisida, & Bowen, 2014). The other issue is that educators tend to see media education as a series of purely technical operations, which can lead to student media production functioning as mindless work (Hobbs, 2004).

In order to resolve these issues, the study has designed an experiential exhibition toward teaching primary students to make short stop-motion films inside the school. This experiential exhibition specifically featuring artifacts geared is complemented by utilizing Kolb (1984)'s experiential learning theory. It is hypothesized that such activities can instill knowledge of media production into the students and improve their technical abilities about media production.

2. Theoretical background

2.1. Media production

The students equipped with media production ability will construct knowledge to deal with the situation of globalization in the twenty-first century and develop lifelong learning skills —to enjoy learning, enhance effectiveness in communication, develop creativity and to develop a critical and analytical mind (Cheung, 2005). In addition, media production can motivate students' interests in subjects because they are encouraged to demonstrate knowledge and understand technical skill in their productions. Moreover, media production provides students the opportunity to put theory into practice through exploring and doing. Learners can encode and (re)produce knowledge relevant to their real lives through media production. For example, a video camera might be employed by a primary school student to record a nature phenomenon explaining a physical principle. From this perspective, the video camera becomes part of everyday communication and the sharing of an idea or concept rather than being a technology for film production (Jenson & al., 2014). However, technology alone would not engage students in media production and succeed. As argued by Dezuanni (2015), technical production skills have value primarily when they develop students' conceptual knowledge.

2.2. Stop-motion films

With the development of current digital technology (e.g., iPad or mobile phone camera, and free movie-making software (e.g. Windows Movie Maker), stop-motion films have become a simplified way for students to create short films in school classrooms (Fleer, 2013). The stop-motion films employ easy-to-use use feasible techniques by taking still images one-by-one with a digital camera mounted on a hand-held mobile phone and generating a video clip

played slowly at two frames per second (Hoban & Nielsen, 2012). This technique is unlike traditional stop-motion animation (e.g. clay animation), which involves manually moving clay models and taking enough photos to play at 25-32 frames/second to continue movement. In other words, this stop-motion technique allows creators to stop, discuss and think about their information while taking each photo (Fleer & Hoban, 2012; Lee, 2015). For example, Wilkerson-Jerde, Gravel and Macrander (2015) emphasize that creating stop-motion films can further engage learners in thinking about the temporal dimensions of phenomena.

The benefits of learners' becoming stop-motion film producers have been discussed in previous research. For example, in the context of university teacher education, Hoban and Nielsen (2014); McKnight, Hoban and Nielsen (2011); Vratulis, Clarke, Hoban and Erickson (2011) have demonstrated the adaptability of stop-motion films on supports teachers in learning various science concepts and technological pedagogical content knowledge.

2.3. Experiential learning

According to Kolb's experiential learning model, knowledge results from the interaction between theory and experience because learning is the process of creating knowledge through the transformation of personal experience (Kolb, 1984). It describes four stages in the learning model. Kolb considers that learning takes place in a spiral-like movement where the four stages take turns (Rasanen, 1999). The following describes the four stages of the experiential learning model (Konak, Clark, & Nasereddin, 2014):

1) Concrete experience. Learning starts with having a concrete experience, which means to perform a new task to gain a direct practical experience.

The findings show that students have improved their knowledge of stop-motion films. Analysis of stop-motion films that the students have created also shows that they also improved in their media ability to represent their ideas and communicate with others. Through analysis of the influence of demographics on the knowledge test about stop-motion films, the findings reveal that the experiential exhibition is more effective for female elementary students, and students previous visit experiences may not affect their acquired knowledge. Given those initial results and observations, we believe that the proposed experiential exhibition for digital media literacy education is a promising one.

2) Reflective observation. Reflective observation carried through in carried through in activities such as discussion and reflective questions enables students to reflect on their hands-on experiences. The learner's self-reflection plays a central role in linking theory to practice.

3) Abstract conceptualization. From the reflective observations of stage 2, learners are expected to formulate a theoretical model and a generalization of abstract concepts.

4) Testing in new situations. In this stage, learners plan and test for the theoretical implications of concepts in new situations. The results of this testing stage provide new concrete experiences.

To date, experiential learning has been adopted in numerous fields of education (Konak & al., 2014). For example, Pringle (2009) developed a six stages of Meaning Making in the Gallery (MMG) framework based on experiential learning model for gallery education. Moreover, Clemons (2006) modified an experiential interior design project that involved the use of elements and principles of design and an opportunity for self-expression of personal spaces.

The research cited above is encouraging, though most focus on university students, suggesting the need for further investigation into elementary students. Also, as suggested by Chang and al. (2011), students' demographic characteristics such as gender differences should be taken into consideration when developing digital media instructional activities. For example, mobile phones may be more suitable to promote male engagement in digital media

literacy. Therefore, this study intended to investigate how elementary teachers can play their role as curators to stage the experiential exhibition featuring enjoyable and educative activities.

2.4. Research questions

1) Does the experiential exhibition improve students' knowledge about stop-motion films?

2) Do students' demographic characteristics affect their knowledge about stop-motion films and film production abilities?

3) Does the experiential exhibition improve students' techniques for producing a stop-motion film?

3. Methodology

3.1. Setting

The exhibition takes place at an exhibition room in an animation elementary school located in southern Taiwan. The mission of the school is to develop students into educated and involved animators through a series of programs and exhibitions. K3 students will learn knowledge of animations from this exhibition every year.

3.2 Participators

In this study, we invited 247 third-grade students lacking practical experience in media production for our analysis. Each student has 125 minutes to participate in this event and extra 25 minutes to finish questionnaires. This is an organized program as well as formal classes for students in the elementary school. In Taiwan, except this elementary school, there are hardly formal classes including animation teaching. Most students have to learn animation subject at some specific workshop if they desire to.

3.3. The design of the experiential exhibition

The proposed experiential exhibition was separated into four stalls and designed to teach students the concept of visual persistence and stop-motion film production (see Figure 1). As shown in Figure 1, K3 students from 9 classes were allowed to enter the exhibition room to receive the 100-minute curriculum each time. The exhibition room was mainly divided into four parts: Stall A, Stall B, Stall C, and Stall D (Figure 1).

1) Stall A: First, the stall guide started with a brief introduction regarding visual persistence. Then, the students used mobile cameras to photograph their preferred objects such as birds, cats, dogs, books and flowers. After the teachers had helped the students print these images, they pasted the printed paper on the blank side of the cardboard, which has a printed cage on the other side, and pasted the cardboard on the stick. Last, they would be surprised to see the photo and the cage on the stick become an object in the cage by rotating the stick quickly. By means of these activities, the students can learn by themselves and get to build the concept of visual persistence by watching the overlapped images.

2) Stall B: We provide the students with flipbooks made by 4k students at the stall. Each flipbook has an individual story, which consists of a series of pictures that vary gradually from one page to the next. When turning these books rapidly, the students can not only enjoy a great number of stories but also will be surprised to see the pictures appear to animate. The students were grouped by three and were asked to collaboratively record the animation through using mobile cameras. Here, we aim to stimulate kids to observe more phenomena of visual persistence, reinforce their conceptual understanding and thus kindle their interest in frame by frame animations.

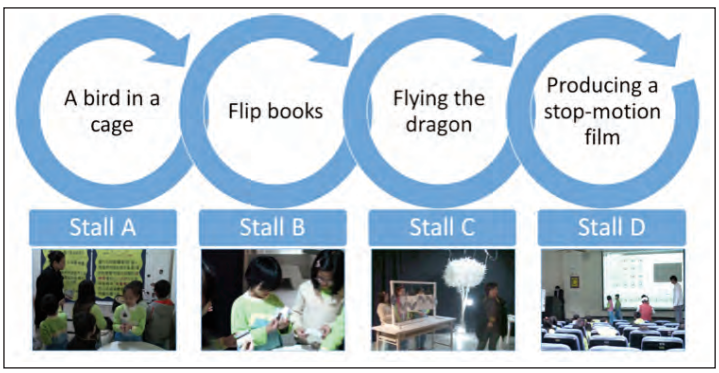


Figure 1. The four stalls of experiential exhibition.

3) Stall C: The students first used many pieces of cardboard to draw a single dragon on--Both sides of the cardboard have a body part of the dragon on them, but they are in different directions. Then they punched the cardboards and attached them in order to the wooden frame with rubber bands in order. After working together to finish

the handicraft project, they could make the dragon "fly" by keeping flipping these cardboards over quickly. Meanwhile, they were also asked to collaboratively record the phenomenon of visual persistence through using mobile cameras. The stall allowed students to cooperate to get the task done, experience the magical phenomenon of visual persistence further. It goes without saying that they got addicted to the charm of stop-motion animation as we expected.

4) Stall D: First, the teachers demonstrated how to create a stop-motion step by step. Then they divided the students into groups of 3-5 and asked each group to make a short film. Each student played an essential part in the group – at least one task per member. After the students created a story together, someone would work on the shooting script, some would be the actors or actresses, someone would be responsible for taking photos, and some should be in charge of the post-production. In the last stall, the students made the short stop-motion film and then screened it in a space whose main purpose was to enable the students to finish a piece of work on their own by combining the knowledge they just acquired using their creativity.

The activities in four stalls of the experiential exhibition incorporated Kolb's experiential learning cycles, comprised of five stages:

a) Manipulating objects. Students commonly get direct practical experience by performing a new task. In our activities, concrete experience corresponded to manipulation of objects. These hands-on activities can engage students through visual and kinesthetic senses.

b) Observing the phenomenon. Students could easily observe the phenomenon of visual persistence through manipulating the objects. Teachers also posed questions to encourage investigation (e.g. what did you see? How did rotation speed affect the view?). Students were also encouraged to exchange their ideas within the group. Through dialogue, students build a better understanding of the phenomenon.

c) Reflecting on the phenomenon. Teachers initiated the discussion questions such as "How did this phenomenon happen?", "Why did you think so?" to prompt students to consider how they have arrived at their interpretations. Group discussion is a particularly effective strategy to promote meaningful reflection and engagement in the learning process.

d) Conceptualizing the experience. The visual persistence was conceptualized by connecting learners' previous real-life experience. The utilization of generalization questions is a useful strategy. For example, teachers would request students to connect what they had performed in the activities with the animation movies they had seen before. Also, they could also be asked to list the advantages and disadvantages of media production techniques.

e) Testing on new objects. We designed four sequential stalls to enable learners to transfer the learned concept to new situations. More specifically, the first two stalls differed in numbers of frames. In stall B, the students performed the multiple-frame animation concept following the two-frame animation concept of stall A. In stall C, students were asked to collaboratively perform the multiple-frame animation concept. This collaborative performance provided a new experience for stall D.

3.4. Instruments

3.4.1. Demographic questionnaire

To gauge the background information of participants, a demographic questionnaire was designed. The items of questionnaire contain gender the number of visits to media exhibitions, and whether they have the experience of media production or not. The item number of visits to media exhibitions, is intended to understand participants' previous experiences about visiting image, animation, and film exhibitions. The item whether they have any experience of media production or not, is directed to understand participants' previous experiences about making an animated or stop-motion film.

3.4.2. Stop-motion film knowledge test

The knowledge on this test was included in two units: the theory of visual persistence and the techniques of the stop-motion film production. For example, the item "Visual persistence states the phenomenon where the retina retains an image for a short period after the removal of the stimulus that produced it", was aimed at examining the concept of visual persistence. In addition, the item "Taking digital still photos one by one with the camera, and then playing back photos quickly on the computer is a kind of stop-motion films", was aimed at examining the techniques of the stop-motion film production. The complete test included 15 true/false test items and was checked by the elementary teacher, who is also the curator of the experiential exhibition.

3.4.3. Scoring rubric in the stop-motion film production

Five experienced elementary teachers were invited to examine the quality of the films produced by students. The examination was based on scoring rubric designed by the curator of the experiential exhibition, who is also the expert in producing stop-motion films. The scoring rubric is comprised of three dimensions. The first dimension stipulates that the running-time for films, shall be no shorter than twenty (20) seconds and no longer than thirty (30) seconds. Failure to meet expectations resulted in automatic deduction of thirty (30) points. The second dimension, requires that there should be no lapses in the scenes for the continuity of films. The scores of the films shall be adjusted according to the numbers of lapses. The final dimension states that the scenes shall flow smoothly from one to another in editing videos. The scores of the films shall be deducted according to the smoothness of the films. The final scores of the films were calculated from an average of five teachers' scores.

3.5. Procedure

Figure 2 shows the experimental procedure. The entire procedure covers three 50-minute classes over a period of successive seven weeks. In the beginning, 247 students were divided into nine groups. In the first week, the stop-motion films which were created by other students from different countries (e.g., "T-shirt War", "It is a Kinder Magic", "Deadline post-it") were selected and showed to students during a regular class session. At the end of the same class, the demographic questionnaire and the knowledge pre-test about stop-motion films were given to the students in all groups. Three weeks later, it was arranged that only one group each time participated in the experiential exhibition during two regular class sessions. The participation of students covered a period of three weeks. The experiential exhibition included was comprised of four stalls. In each stall, the teachers led students to get involved in the activities. And then, the teachers showed students the films created by themselves and made favorable comments on their works. Upon completion of the day's learning activities, students were given 10 minutes to complete a post activity test on their knowledge of stop-motion films.

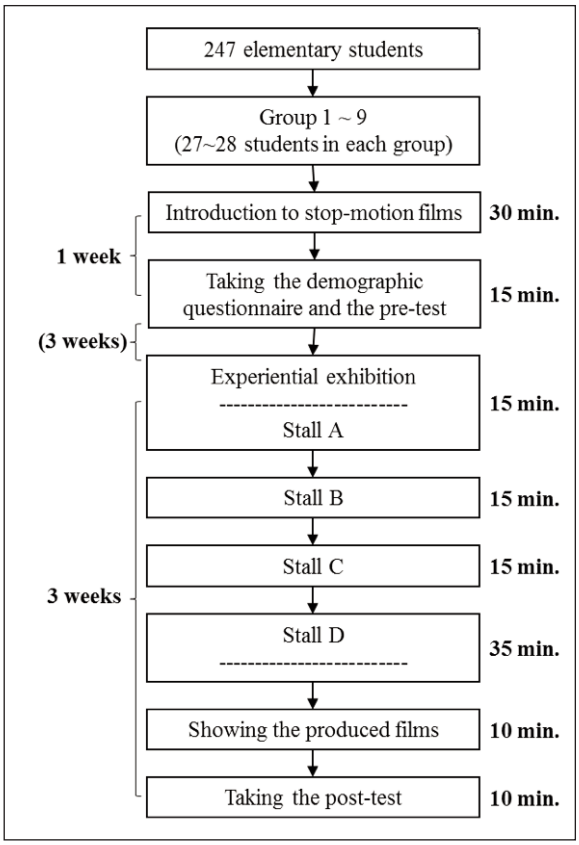


Figure 2. Experimental procedure.

4. Results and discussion

4.1. Demographics

The results in Table 1 show that the numbers of female and male participants are almost equal. The number of times that students visited the media exhibitions indicated that half of the students had attended the media exhibitions more than ten times. However, no one has the experience of media production yet.

The finding of Table 1 reveals that students participating in this study had previous experience in going to media exhibitions, but lacked experience in media production. The rich experiences of elementary students in visiting media exhibitions can be attributed to the growing trend of emphasizing the cultural and creative industries in Taiwan (Chen, Wang, & Sun, 2012). Many media exhibitions featuring creative objects were staged for public media literacy promotion. However, the finding of lacked of experience in media production also provides the research with the background for this paper: Most children received passive experiences in visiting the exhibitions, lacking active experimentation to be effective media analysts and promote social and culture participation (Clemons, 2006).

4.2. The knowledge test about stop-motion films

The result shows that the difference between students' pre-test and post-test mean scores of knowledge about stop-motion films has a significant difference, t (246)=-21.337, p=<.001. Students' post-test mean scores (M=10.23, SD=1.81) are higher than their pre-test mean scores (M=13.09, SD=1.3).

Table 1 Demographic characteristics of participants (N=247)

Characteristic	n	%
Gender		
Female	125	51
Male	122	49
Number of visits to media exhibitions (e.g., photos, animations, films)		
0	11	5
1-5	31	13
6-10	40	16
10+	165	66
Having the experience of media production (e.g., animations, films)		
Yes	0	0
No	247	100

The results imply that the designed experiential exhibition can significantly improve their knowledge of stop-motion films. To our knowledge, this is the first study involving elementary students in learning about stop-motion films. Through manipulating concrete objects in the stalls of the experiential exhibition, the abstract concept is physically presented. The elementary students find it easier to relate the new concept to their previous experiences (Santos & al., 2014).

4.3. The influence of demographics on the knowledge test about stop-motion films

4.3.1. Gender differences

An ANCOVA was performed to determine how post-test knowledge scores of stop-motion films are influenced by participants' gender while controlling the differences among the students' pre-test knowledge scores of stop-motion animation (Table 2). Significant effects across different gender were found for the post-test knowledge scores, F (1, 244) = 5.32, p = .04. Post hoc analyses of the outcomes show that female students gain higher scores than male students.

The findings of Table 2 are consistent with Chang and Liu (2011); Chang and al. (2011)'s studies that female elementary students tend to be more media literate than male ones. The results can be attributed to two reasons. First, girls may use media in a more balanced way that involves both traditional and new digital media literacies, whereas boys may still be more focused on related new digital media literacy such as mobile devices (Unlusoy, de-Haan, Leseman, & Van-Kruistum, 2010). Our experiential exhibition concerns both traditional paper-based and new digital media activities, and thus girls were more engaged in such activities. Second, boys may view the digital media device as a playful toy, whereas girls may treat it as a tool to accomplish a task (Lee & Yuan, 2010). Therefore, girls may demonstrate a higher level of engagement in the experiential exhibition, allowing them to outscore boys on knowledge test of stop-motion films.

Table 2. Pre- and post-test mean scores, standard deviations, and analysis of covariance (ANCOVA) results for two genders and four visiting times conditions

Knowledge test of Stop- motion animation	Pre-test		Post-test		ANCOVA	
	M	SD	M	SD	F	d
Sex					F(1,244)=5.32*	.02
Female (n=125)	10.23	1.79	13.28	1.18		
Male (n=122)	10.22	1.83	12.90	1.39		
Number of visits to media exhibitions					F(3,242)=1.58	.02
0	9.27	1.56	12.36	1.63		
1-5	10.10	1.68	12.84	1.32		
6-10	10.46	1.88	13.13	1.30		
10+	10.25	1.82	13.18	1.27		
*p< .05.						

4.3.2. Previous experiences of visiting media exhibitions

An ANCOVA was also performed to determine how post-test knowledge scores of stop-motion animation are influenced by the number of participants' previous visits to media exhibitions while controlling the differences among the students' pre-test knowledge scores of stop-motion animation. Table 2 indicates that there is no significant difference in post-test knowledge scores across the four visiting times conditions, F(3,242)=1.58, p=.08.

The finding of Table 2 is inconsistent with our hypothesis that students possessing extensive prior experiences of media learning should outperform those possessing poor prior experiences in knowledge about stop-motion films.

One explanation is that students were free to roam the exhibitions without an instructional guide (Greene & al., 2014). Students retain little factual information from these exhibitions (Greene & al., 2014; Rasanen, 1999). However, this format is the norm in visiting exhibitions. The other explanation is that exhibition educators (e.g., docents, teachers) interpret the objects based on verbal conceptualization (Rasanen, 1999). Students passively received interpretation of objects, lacking active experimentation (Pringle, 2009). Consequently, students' prior experiences cannot facilitate media learning in new situations.

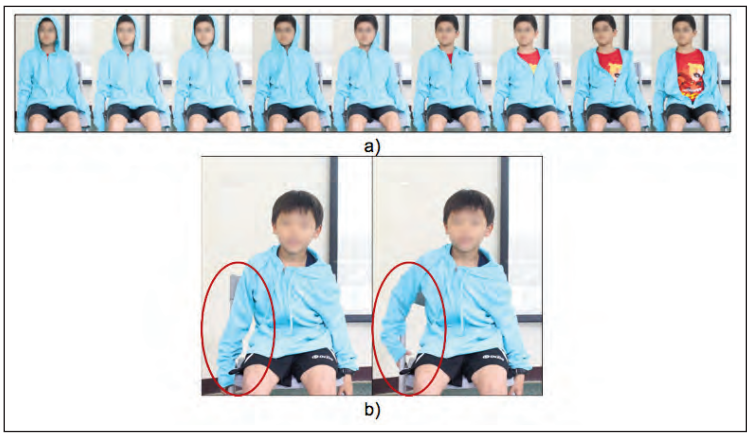


Figure 3. a) A student's stop-motion film lacking logical coherence Selection of still images from a stop-motion film.

4.4. Stop-motion film production

The scored Format, Continuity, and Sequencing of produced films averaged scores of 30, 17.3 and 23.0 respectively. The scored stop-motion films averaged an overall score of 71.2 (SD = 10.56). The overall scores for these short films reveal that students get to produce good quality films through participating in the exhibitions. As shown in an example from the students (see Figure 3a), they represented a stop-motion film about adopting a hands-off approach to take off an anorak. In particular, the breakdown suggests that all of the groups can cope with the format of films. In other words, students have clear concepts that a stop-motion film is comprised of a sequence of photos and how many photos are necessary to make a 20 to 30-second film. The breakdown also suggests that students had some difficulty in maintaining the continuity of films. Films showed in fig 3b illustrate this the cause of the error could be forgetfulness or carelessness to establish a logical coherence between shots. Moreover, students also found some difficulties in editing a film with a smooth sequence. The common error in students' films that affected their sequencing was that the movement of bodies or objects tended to shrink over time. The tendency may be attributed to either student's lack of attention to a gradual shift toward movement or the attempt to reduce the amount of photos they needed to shot by making the movement smaller.

The effect can be attributed to the characteristics of stop-motion. While making the stop-motion films, students can take still photos one by one, that allows students to stop, discuss and think about their information (Fleer & Hoban, 2012; V. R. Lee, 2015). In other words, the stall of producing a stop-motion film in the experiential exhibition could provide students with new collaborative experience, which echoes Konak and al. (2014) studies.

5. Limitations of the study

One of the limitations of the research is that we report on a single-group intervention. Furthermore, because this experiential exhibition was held at the end of the school year and faced formal classroom scheduling constraints, we were unable to explore the long-term influences of such approaches over students' digital media literacy. Also, we curated the theme exhibition on stop-motion films. Extending this approach to students' formal learning programs would be interesting. Another limitation of the research is that all the participants were grade 3 students. Therefore, the findings in this research should be generalized with caution. Finally, we also recommend further research considers how to guide the young people to understand and analyze the social and cultural phenomenon through the production process.

6. Pedagogical implication

There are several implications from this study regarding the learning of stop-motion film production through visiting the experiential exhibition. First, this study shows that the new strategy of digital media literacy education can be adopted to instruct students in the knowledge about stop-motion films and further facilitate them to create short films within 100 minutes; above all, it can be fitted into typical elementary education classes. The experiential exhibition may provide

opportunities for widespread staging in elementary education classes as a new way to develop digital media literacy.

Second, the simplicity of the slow-motion film production techniques creates additional possibilities for making the valuable use of mobile devices in elementary schools. It is uncommon in modern elementary education due to tight scheduling constraints in courses and the time-consuming nature of making stop-motion films in a traditional way (Fleer, 2013). However, by the use of mobile phone cameras, electronic tablets such as iPads, and built-in generic movie making software, elementary students can learn how to make a stop-motion film during the 1.5 h exhibition. After that, they can also use their personal mobile phones to capture images and create their films at home.

Third, stop-motion films can be made in many subject areas such as science, geography, and geometry (Hoban & Nielsen, 2014). In particular, it is suitable for difficult topics involving change and relative movement such as phases of the moon.

A final implication is that the experiential exhibition offers students a chance to collaboratively reflect and discuss the media concepts within the groups. Furthermore, uploading their films to social websites (on YouTube, for example) for public reviewing is a good way to provide students with an additional option of using multimodal communication to share and respond with other learners.

7. Discussion and conclusions

Current literature has shown the value of university students as media makers, but none of the studies involved elementary students (Hoban & Nielsen, 2014; McKnight & al., 2011; Vratulis & al., 2011). Therefore, the research in this paper designed a media exhibition based on Kolb's experiential learning model to teach them concepts of stop-motion films and techniques of stop-motion film production. Such an experiential exhibition features that learning to constructing knowledge, skills and value through tangible experiences, which is different from the traditional methods of exhibitions that are using verbal conceptualization and delivering abstracted knowledge (Clemons, 2006; Rasanen, 1999; Santos & al., 2014). It is hypothesized that the proposed experiential exhibition is effective to provide an informal learning experience of digital media literacy and can be widely staged in elementary education classes.

A designed experiment involved 247 grade 3 elementary students that were grouped to visit four stalls of an experiential exhibition around the theme of stop-motion techniques and film production. Each stall contained a cycle of hands-on activities that involved students in manipulating objects, observing the phenomenon, reflecting the phenomenon, conceptualizing the concept, testing on new objects. The designed experiment placed students in constructive learning environments and involved multiples cycles of experimenting, reflecting, and conceptualizing in collaboration. These are all keys to digital media literacy, and as demonstrated in this article, can be effectively brought in at the elementary level.

The findings show that students have improved their knowledge of stop-motion films. Analysis of stop-motion films that the students have created also shows that they also improved in their media ability to represent their ideas and communicate with others. Through analysis of the influence of demographics on the knowledge test about stop-motion films, the findings reveal that the experiential exhibition is more effective for female elementary students, and students previous visit experiences may not affect their acquired knowledge. Given those initial results and observations, we believe that the proposed experiential exhibition for digital media literacy education is a promising one.

In Taiwan, art curriculums are commonly taugt to k1-k12 students in classroom. These curriculums usually focus on basic types of artistic creation, such as painting, drawing, and sculpture. Nowadays, to participate in the arts is to get involved and take part, a process which can occur on many levels. Therefore, art learning shouldn't be limited by formal education and it should happen anywhere. In fact, actually, the source of art creation comes from human beings' awareness and thought, all we have to do is to inspire students.

Funding agency

This research is partially supported by the Ministry of Science and Technology, Taiwan, R.O.C. under Grant no. MOST 105-2511-S-006 -015 -MY2.

References

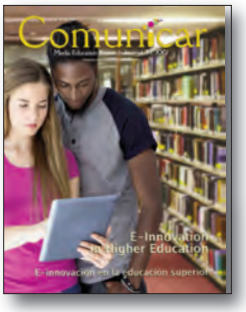
Chang, C.S., & Liu, E.Z.F. (2011). Exploring the Media Literacy of Taiwanese Elementary School Students. *Asia-Pacific Education Researcher, 20*(3), 604-611.

Chang, C.S., Liu, E.Z.F., Lee, C.Y., Chen, N.S., Hu, D.C., & Lin, C.H. (2011). Developing and Validating a Media Literacy Self-evaluation

Scale (MLSS) for Elementary School Students. *Turkish Online Journal of Educational Technology, 10*(2), 63-71.
Chen, M.Y.C., Wang, Y.S., & Sun, V. (2012). Intellectual Capital and Organizational Commitment: Evidence from Cultural Creative Industries in Taiwan. *Personnel Review, 41*(3), 321-339. https://doi.org/10.1108/00483481211212968
Cheung, C.K. (2005). The Relevance of Media Education in Primary Schools in Hong Kong in the Age of Mew Media: A Case Study. *Educational Studies, 31*(4), 361-374. https://doi.org/10.1080/03055690500237033
Cheung, C.K. (2009). Education Reform as an Agent of Change: The Development of Media Literacy in Hong Kong during the Last Decade. [Reforma educativa y educación en medios como agentes de cambio en Hong Kong]. *Comunicar, 32*, 73-83. https://doi.org/10.3916/c32-2009-02-006
Clemons, S.A. (2006). Interior Design Supports art Education: A Case Study. *International Journal of Art & Design Education*, *25*(3), 275-285. https://doi.org/10.1111/j.1476-8070.2006.00494.x
Dezuanni, M. (2015). The Building Blocks of Digital Media Literacy: Socio-material Participation and the Production of Media Knowledge. *Journal of Curriculum Studies, 47*(3), 416-439. https://doi.org/10.1080/00
Fleer, M. (2013). Affective Imagination in Science Education: Determining the Emotional Nature of Scientific and Technological Learning of Young Children. *Research in Science Education*, *43*(5), 2085-2106. https://doi.org/10.1007/s11165-012-9344-8
Fleer, M., & Hoban, G. (2012). Using 'Slowmation' for Intentional Teaching in Early Childhood Centres: Possibilities and Imaginigs. *Australasian Journal of Early Childhood*, *37*(3), 61-70.
Frechette, J.D. (2002). *Developing Media Literacy in Cyberspace: Pedagogy and Critical Learning for the Twenty-First-Century Classroom*. Westport, CT: Praeger.
Greene, J.P., Kisida, B., & Bowen, D.H. (2014). The Educational Value of Field Trips: Taking Students to an Art Museum Improves Critical Thinking Skills, and More. *Education Next*, *14*(1), 78-86.
Hoban, G., & Nielsen, W. (2012). Using "Slowmation" to Enable Preservice Primary Teachers to Create Multimodal Representations of Science Concepts. *Research in Science Education*, *42*(6), 1101-1119. https://doi.org/10.1007/s11165-011-9236-3
Hoban, G., & Nielsen, W. (2014). Creating a Narrated Stop-motion Animation to Explain Science: The Affordances of "Slowmation" for Generating Discussion. *Teaching and Teacher Education*, *42*, 68-78. https://doi.org/10.1016/j.tate.2014.04.007
Hobbs, R. (2004). A Review of School-based Initiatives in Media Literacy Education. *American Behavioral Scientist*, *48*(1), 42-59. https://doi.org/10.1177/0002764204267250
Jenson, J., Dahya, N., & Fisher, S. (2014). Valuing Production Values: a 'Do it Yourself' Media Production Club. *Learning Media and Technology, 39*(2), 215-228. https://doi.org/10.1080/17439884.2013.799486
Kolb, D.A. (1984). *Experiential Learning: Experience as the Source of Learning and Development*. Englewood Cliffs, NJ: Prentice Hall.
Konak, A., Clark, T.K., & Nasereddin, M. (2014). Using Kolb's Experiential Learning Cycle to Improve Student Learning in Virtual Computer Laboratories. *Computers & Education*, *72*, 11-22. https://doi.org/10.1016/j.compedu.2013.10.013
Lee, C.Y., & Yuan, Y. (2010). Gender Differences in the Relationship between Taiwanese Adolescents' Mathematics Attitudes and their Perceptions toward Virtual Manipulatives. *International Journal of Science and Mathematics Education*, *8*(5), 937-950.
Lee, V.R. (2015). Combining High-speed Cameras and Stop-motion Animation Software to Support Students' Modeling of Human Body Movement. *Journal of Science Education and Technology, 24*(2-3), 178-191. https://doi.org/10.1007/s10956-014-9521-9
López, L., & Aguaded, M.C. (2015). Teaching Media Literacy in Colleges of Education and Communication. [La docencia sobre alfabetización mediática en las Facultades de Educación y Comunicación]. *Comunicar, 44*, 187-195. https://doi.org/10.3916/c44-2015-20
McKnight, A., Hoban, G., & Nielsen, W. (2011). Using Slowmation for Animated Storytelling to Represent non-Aboriginal Preservice Teachers' Awareness of "Relatedness to Country". *Australasian Journal of Educational Technology, 27*(1), 41-54.
Pringle, E. (2009). The Artist-led Pedagogic Process in the Contemporary Art Gallery: Developing a Meaning Making Framework. *International Journal of Art & Design Education*, *28*(2), 174-182.
Ramírez-García, A., & González-Fernández, N. (2016). Media Competence of Teachers and Students of Compulsory Education in Spain. [Competencia mediática del profesorado y del alumnado de educación obligatoria en España]. *Comunicar, 49*, 49-57. https://doi.org/10.3916/c49-2016-05
Rasanen, M. (1999). Building Bridges: Experiential art Understanding. J*ournal of Art & Design Education*, *18*(2), 195-205.
Santos, M.E.C., Chen, A., Taketomi, T., Yamamoto, G., Miyazaki, J., & Kato, H. (2014). Augmented Reality Learning Experiences: Survey of Prototype Design and Evaluation. *IEEE Transactions on Learning Technologies*, *7*(1), 38-56. https://doi.org/10.1109/tlt.2013.37
Unlusoy, A., de Haan, M., Leseman, P.M., & van-Kruistum, C. (2010). Gender Differences in Adolescents' Out-of-school Literacy Practices: A Multifaceted Approach. *Computers & Education*, *55*(2), 742-751. https://doi.org/10.1016/j.compedu.2010.03.007
Vratulis, V., Clarke, T., Hoban, G., & Erickson, G. (2011). Additive and Disruptive Pedagogies: The Use of Slowmation as an Example of Digital Technology Implementation. *Teaching and Teacher Education*, *27*(8), 1179-1188. https://doi.org/10.1016/j.tate.2011.06.004
Wilkerson-Jerde, M.H., Gravel, B., & Macrander, C.A. (2015). Exploring Shifts in Middle School Learners' Modeling Activity while Generating Drawings, Animations, and Computational Simulations of Molecular Diffusion. *Journal of Science Education and Technology, 24*(2-3), 396-415. https://doi.org/10.1007/s10956-014-9497-5

© ISSN: 1134-3478 • e-ISSN: 1988-3293

Comunicar, n. 51, v. XXV, 2017 | Media Education Research Journal | ISSN: 1134-3478; e-ISSN: 1988-3293
www.comunicarjournal.com



Ecosystems of Media Training and Competence: International Assessment of its Implementation in Higher Education

Ecosistemas de formación y competencia mediática: Valoración internacional sobre su implementación en la educación superior

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ABSTRACT

n a globalized and media society with unprecedented technological development, higher learning institutions are adapting their training models to face these new challenges. This study aims to determine students' self-perception of their media competence and the differential influence of an ecosystemic model of training that is being implemented experimentally. The research methodology was mixed, as both quantitative (descriptive and inferential analysis) and a qualitative analysis (content analysis) were conducted. A total of 808 university students enrolled in the 2015-16 academic year from different university centers and countries (Faculty of Teacher Training and Education, and Faculty of Economics-Business at the University of Oviedo (Spain) and the Technological Institute of Mexico), completed a questionnaire on media competence and wrote open reports about their experience with ecosystemic models. The results showed that university students had a favorable self-perception of their level of media competence, and they considered its development by means of transversal training and ecosystemic training models to be important. Significant differences between the students of the different degrees also emerged, depending on whether or not an ecosystemic approach was used to develop the courses. In conclusion, the study showed that these models favored teaching-learning processes at the university when the technology was adapted to the users' needs, interests and capacities, thereby improving their media competence.

RESUMEN

En una sociedad mediática y globalizada, con un desarrollo sin precedentes de la tecnología, las instituciones de educación superior están adaptando sus modelos de formación para hacer frente a este nuevo desafío. Este estudio tuvo por objetivo conocer la autopercepción del alumnado sobre su competencia mediática y determinar la influencia diferencial de un modelo ecosistémico de formación que se está implementando de manera experimental. La metodología de investigación combina el análisis cuantitativo (descriptivo e inferencial) con el cualitativo (análisis de contenido). Un total de 808 estudiantes universitarios matriculados en el curso 2015-16 en diferentes instituciones y países (Facultad de Formación del Profesorado y Educación, y Facultad de Economía y Empresa de la Universidad de Oviedo, y el Instituto Tecnológico Nacional de México) cumplimentaron un cuestionario sobre competencia mediática y realizaron informes abiertos sobre su experiencia con modelos ecosistémicos. Los resultados mostraron que el alumnado universitario tiene una autopercepción favorable sobre su nivel de competencia mediática y considera importante su desarrollo a través de un aprendizaje transversal con modelos de formación ecosistémicos. También emergen diferencias significativas entre las titulaciones y países. En conclusión, el estudio avala que estos modelos favorecen los procesos de enseñanza-aprendizaje en la universidad cuando la tecnología se adapta a las necesidades, intereses y capacidades de las personas mejorando, por tanto, su competencia mediática.

KEYWORDS | PALABRAS CLAVE

Edu-communication, communicative ecosystem, social inclusion, didactic methodology, collaborative learning, meaningful learning, teaching, blended-learning.

Educomunicación, ecosistema comunicativo, inclusión social, metodología didáctica, aprendizaje colaborativo, aprendizaje significativo, práctica docente, enseñanza combinada.

Received: 2016-05-29 | Reviewed: 2016-07-11 | Accepted: 2016-12-02 | Preprint: 2017-02-15 | Published: 2017-04-01
DOI: https://doi.org/10.3916/C51-2017-10 | Pages: 105-114

1. Introduction

Society, education and the university are destined to reinterpret their relationships at each historical moment based on the priorities that are deemed appropriate by the entities, governments, businesses or advocacy-groups that have the ability to make decisions according to the available resources in order to answer to the needs or demands of the population, in general, and of the organizations and professional workers, specifically.

If we accept this argument, then we accept the premise that society is in constant transformation (Toffler, 1980) due to its informational (Castells, 1999) and fluid (Area, 2012) characters, and that communication has an effect on the basic tasks of people in their social, work, political, economic, cultural and personal environments. This makes it necessary for the educational institutions to provide learning models that are coherent so that the citizens become competent in a media-ruled environment where the television, films, the radio, the press, computers, social networks, tablets, videogames or mobile phones form part of everyday life (Fedorov, 2014; Gozálvez, 2013). In this globalized media context, the users of this technology must have continuous literacy that will help them become "competent prosumers" (Caldeiro-Pedreira & Aguaded, 2015; Sánchez & Contreras, 2012), as these technological tools emerge and evolve in a constant spiral that demands from the people a critical and ethical analysis of a scenario where they are receptors and producers of messages.

In the process of constructing the European Higher Education Area (EHEA), the universities have been taken of this situation into account, and have therefore designed work environments by deploying different strategies that are interconnected in their objectives, their possibilities and their user's profiles. The problems come from their intentions not being linearly translated into practice, as multiple problems arise during the implementation processes (Ferrés & Masanet, 2015), as a result of the frictions that are generated with the organizational and functional cultures of the University faculties, schools and departments, as they are full of social, cultural and political meanings that filter the external prescriptions to adapt them to interests that have different meanings.

Nevertheless, it cannot be denied that there have been many advances contributed by research studies, highlighting, among others, the importance that is attributed to the learner (León & Latas, 2005); the classroom context (Entwistle & Tait, 1990); the institutional environment (Ramsden, Martin, & Bouden, 1989); the pedagogic competence (Sánchez-Gómez & García-Valcárcel, 2002); the curriculum (Gimeno-Sacristán, 2001; 2008); technology and social networks (García-Galera, 2013); collaboration (Kolloffel, Eysink, & Jong, 2011); active methodologies (Cano, 2009); study plans (Zabalza, 2002); teaching-learning processes (Carracosa, 2005); formative (internal) evaluation (Monereo, 2009), organizational models (Buckland, 2009) and media education.

Their conclusions make it necessary to reflect, in a reasoned and calm manner, on how to improve the quality of teaching at the university, starting from the experiences available and attending to the need of bolstering transversal and longitudinal media education "that overcomes the excessively-technological and instrumental vision, that due to the trends and technological advances, have frequently confounded politicians, administrators and society in general, and has distorted and ignored the inherent characteristics and qualities of the media when taking education into account" (Aguaded, 2012: 260). The main content of this article is framed within this context, and presents an overview of blended-learning teaching ecosystems that have been utilized in the last few years (Álvarez-Arregui & Rodríguez-Martín, 2013), as they have been considered a viable alternative for shifting from an information society towards a society of media knowledge and inclusiveness (DeJaeghere, 2009; Rodríguez-Martín & Álvarez-Arregui, 2014).

1.1. Training ecosystems in university teaching

Training ecosystems in higher education are relatively recent, although there are currently many innovative experiments that are promoting dynamic and collaborative relationships between community members. Among the promising proposals, we find the Modular ecosystem (Dimitrov, 2001); the Knowledge ecosystem (Shrivastava, 1998); the e-learning ecosystem for management and support of learning (Ismail, 2001); the e-learning ecosystem for governance (Chang & Lorna, 2008) or the learning ecosystem (LES) of Gült and Chang (2009).

These models incorporate learning design, human resources, training for the development of basic competencies, a communication system, and different applications (Shimaa, Nasr, & Helmy, 2011). Although we coincide with the basic tenets, we believe, as do other authors, that the dangers derived from an excessive shift towards e-learning should be analyzed (Uden, Wangsa, & Damiani, 2007), as the communication potentials that in-person learning technologies bring, could be wasted. This is the reason why we prefer to align ourselves with blended-learning models.

1.2. A learning ecosystem to learn to undertake (ECOFAE)

Taking into account the research cited above, we have been developing a model at the University of Oviedo that we have applied to training projects in education, social and work areas as well as in innovation and research projects (Figure 1) that aims to develop professional communities of learning that are interconnected, cohesive and self-regulating within national and international institutions. The construction of this ecosystem is the result of posing questions and planning a reference structure that is flexible and dynamic that can be continuously perfected thanks to diagnosis, evaluations and research. The basic design of the model is composed of five phases:

Figure 1. Training eco-environment.

– Phase I. Planning and diagnosis. Instruments that provide us with information at the start and the end of the process are prepared in order to determine the needs and the impact of the education intervention. The students complete diverse questionnaires (study habits, communication and digital competency, learning styles, etc.).

– Phase II. Design of the training context. This is constructed around two spaces, the virtual and the in-person. The virtual surroundings adopt a modular, scalable and adaptable structure (Figure 2).

• Information module. Here we incorporate the degree's documentation, the official program of the course, the general bibliography and the news forum.

• Communication module. In this module, all the available communication tools are included (forum, Skype, blog, Facebook, Twitter, etc.).

• Diagnostic module. The elements allow the student body to understand their learning styles, study habits, media competency and previous knowledge. In Dropbox, Google calendar and in general forums, we collect what is expected and the perceptions on the subjects, which will be compared at the end of the academic year.

• Theory module. A general guideline of the contents, schemes, links, bibliographic references, presentations (PowerPoint, Prezi…) are included here, so that all the participants (student body and professionals) can access them.

• Practices module. Individual, group, in-person and virtual activities are planned.

• Self-management and learning support module. A bank of resources and good-practices are found here.

• Research and impact assessment module. Here we find the official external assessments that are conducted by the Technical Quality Unit from the University of Oviedo and internal evaluations, where we find the information provided in the forums, the blogs, the social networks, in the classroom debates and the research studies.

– Phase III. Deployment of the learning model. This is done through four systems:

- Registration and information system.
- Tutoring and counseling system.
- Relations and communications system.

• Self-assessment of learning system.

– Phase IV. Evaluation of improvement. This module is structured into three sections:

• First. This shows the results of the evaluations that are conducted by the Technical Quality Unit from the University of Oviedo.

• Second. This collects the public opinions (blogs, forums, Facebook, Twitter…) given by the students on the methodologies that are being implemented.

• Third: It compares the initial diagnostic of the participant's profiles with their state at the end of the semester; their degree of satisfaction with the training ecosystem and the competencies acquired are determined.

– Phase V. Research on impact and transfer. Periodical research studies on the processes, results and the model design are conducted.

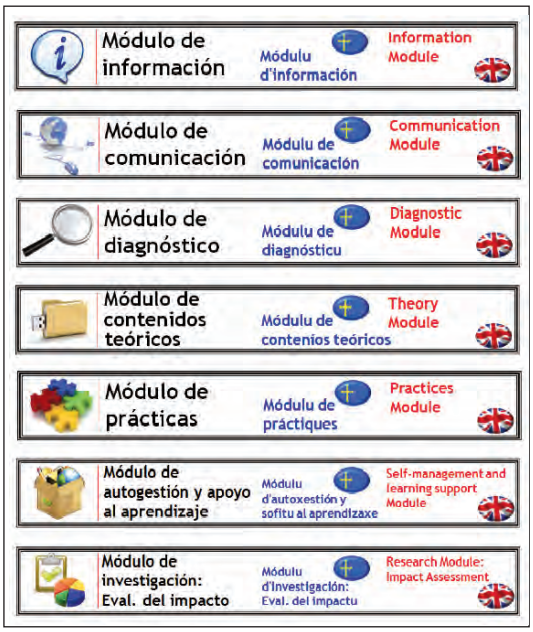

Figure 2. Virtual environment modules.

Talking into account this design, we put forward this research work, with the aim of determining the degree of self-perception the students have on their media competency, and to analyze the degree of influence that the blended-learning ecosystems have within it when used as a training modality. More specifically, we aim to 1) Understand the participating university student's self-perceived media competency; 2) Evaluate the indicators of media competency that are more important for the students; 3) To determine the impact of the training ecosystems in the self-perceived media competency; 4) Analyze the value that the student body grants to the training ecosystems.

2. Materials and methods

2.1. Participants

The empirical study was conducted in Spain and in Mexico through the use of questionnaires. In the case of Spain, this was conducted at the University of Oviedo with students in the Pedagogy Degree (n=122) and the Primary Education Teacher degree (n=182), administered by the Faculty of Teacher Training and Education; as well as the Business Administration Degree (n=192) taught by the Faculty of Economics and Business. And in the case of Mexico, at the Technological Institute of Mexico (Michoacán) with students enrolled in the Business Management Engineering (n=105), in the Industrial Engineering (n=114) and the Electrical Engineering Degrees (n=103).

The target audience of the questionnaire, starting from non-probabilistic sample, was a set of 808 second and third-year students, which totaled 53.7% of the 1505 students enrolled in the 2015-16 academic year at both participating institutions. During the research study, 118 reports were contributed by the students enrolled in the Pedagogy and Teacher Degrees from the Faculty of Teacher Training and Education at the University of Oviedo (Spain; n=60) and the Industrial Engineering and Electrical Engineering Degrees from the Technological Institute (Mexico; n=58) that participated in the implementation of the ecosystemic model of training for the development of media competency.

2.2. Instruments and procedures

The instrument used to evaluate media competency was a questionnaire (77 items) that had already been statistically validated (Gozálvez-Pérez, González-Fernández, & Caldeiro-Pedreira, 2014), while a custom-made scale was used for understanding the level of satisfaction with the training model (20 items), which was validated in previous international research studies (Álvarez-Arregui & Rodríguez-Martín, 2013). These instruments were applied between October, 2015 and January, 2016, and were presented to the participants in an integrated manner divided into four sections (97 items):

• Participant profile (37 items): gender, degree, faculty, type of center attended for upper secondary education

(baccalaureate), academic trajectory, mastery of languages, knowledge of computer programs, time spent and use of computers and mobile phone for study and leisure.

• Self-perceived media competency (29 items), with a range of answers of 4 points: 1 (very low), 2 (low), 3 (average) and 4 (high).

• Importance attributed to different competencies related to media education (11 items), with a range of answers of 4 points: 1 (not important), 2 (low importance), 3 (average importance), 4 (high importance).

• Design of the training ecosystem, its tools and its influence on the development of media competency (20 items), with a range of answers of 4 points: 1 (none), 2 (little), 3 (sufficient), 4 (a lot).

The sampling error was 5.5% (95%), and the level of confidence Z=1.96; p=q=0.5 (95%). The level of reliability was calculated with Cronbach's alpha (.916); the correlation between forms (0.592), Spearman-Brown Coefficient (.770) and Guttman's split-half (.759). Validity was determined through three internal expert reviews, two professors from the University of Oviedo, a professor from the University of Cantabria, and an expert professional from Lausanne (Switzerland).

The quantitative information from the questionnaire's items were analyzed with the SPSS 19 software program for: reliability analysis, frequency analysis, mean differences (T-Test for independent factors, using Student's T-test and Levene's test to estimate equality of variances) as well as Analysis of Variance (ANOVA and the post-hoc Scheffé's test with the one-way subprogram).

Table 1. Qualitative data identification references

Codes	Meaning
Q, R,	Type of instrument (Q: Questionnaire; R: Report)
Numbering	Segment of meaning using digits (003, 005, 125)
M or F	Gender (M: Male; F: Female)
IP, V	Modality of study (IP: In-person; V: Virtual)
P, T, IE, EE	Degree (P: Pedagogy; T: Teacher; IE: Industrial Engineering; EE: Electrical Engineering)
Examples	(Q.123.F.IP.T.) Questionnaire, 123, Female, In-person, Teacher (R.12.M.V.P.) Report, 012, Male, Virtual, Pedagogy

The qualitative data were generated from the comments to the open-ended questions from students enrolled in the three degrees and the 118 open reports provided by the students from the Pedagogy and Teacher degrees. The content analysis was conducted with the Aquad 7.0 program (Huber & Gürtler, 2013). The qualitative information was transcribed and exported to the program, and the analysis conducted were oriented towards reducing/grouping information through a search of keywords, elaboration of segments of meaning, cataloguing, linking and code cross-referencing. The comments that illustrated the arguments were identified with specific codes.

3. Analysis and results

3.1. Self-perceived media competency

The students generally evaluated their media competence as being adequate, although some nuances should be noted. As a group, they considered themselves able (79%) to evaluate the sociopolitical tendencies of the most widely-circulated communication media, to communicate through the media by utilizing a language that was different according to the audience (50%) and the aim of the message (46%), as well as utilizing technology in their learning processes.

These general perceptions should be put into context if we take into account that only 23.4% were able to clearly differentiate between the different codes utilized by the emitter in the messages they received from the media, almost a third (30.6%) believed that their media competency had an adequate level for co-habiting with technological media. To a lesser degree, they were able to interpret and produce messages in a critical, responsible and creative manner, as well as using software programs to edit sequences of images and to create videos.

In general, they were able to differentiate between reliable and non-reliable sources of information. Their failings were associated with the lack of knowledge on the existence and/or aim of the Audiovisual Councils, legislation that protects the users in the production of media content and intellectual property. Their interest for being current on technological and communicative resources was highlighted when they could be applied to academic tasks. Therefore, the students' predisposition in this area should be taken advantage of.

A great majority of the students positively-valued the importance of media competency in society (53.2%) and the management of information (42.7%), but they also recognized its risks (56.9%), which led to their positive opinion on their ethical and responsible consumption. They also recognized the advantages of media use in their day-to-day lives

(40.3%), but they did not grant too much importance at the personal and social levels (28.4%) to using the ICT, technically or critically, as they believed that was enough to be able to use them habitually as consumers. Therefore, being a prosumer did not worry them in excess (26.6%), or trying to understand the structures and super-structures of the media.

Table 2. Participant's self-perceived media competency

Items	Results (%)			
	*1	**2	***3	****4
I am able to communicate in the media using a different language as a function of:				
The context	0.4	5.2	56.0	38.3
The recipient	1.2	6.9	41.9	50.0
The aim of the message	0.4	7.3	46.4	46.0
I use technological educational resources to learn more effectively	0.0	11.7	51.2	37.1
I use different traditional communication media as a resource in learning processes (radio, press, film, TV...)	4.0	23.0	44.4	28.6
I use current communication media to learn (Internet, social networks, YouTube...)	2.0	8.1	42.7	47.2
I am able to use tools to access Internet content	0.4	8.9	50.4	40.3
I am able to manage information gathered from the Internet to more effectively carry out academic tasks	0.4	5.2	52.4	41.9
I use computer programs to edit sequences of images and create videos	5.6	39.5	29.8	25.0
I am able to distinguish socio-political tendencies in the most widely-distributed communication media	0.0	1.2	27.0	79.0
I am able to discern trustworthy sources of information from others that are not	2.0	15.7	54.0	28.2
I like to stay up to date with new technological and communication resources that I could use for academic tasks	2.4	2.4	45.6	24.6
I have knowledge about the existence and aim of Audiovisual Councils	11.3	43.1	36.3	9.3
I know the laws that protect users and consumers in the production of media content	11.3	56.0	22.2	10.5
I possess knowledge on the regulatory policy on intellectual property	18.1	45.2	29.4	7.3
My level of media competency is adequate for being able to interpret messages in a critical, responsible and creative manner	3.2	14.9	60.5	21.4
My level of media competency is adequate for being able to produce messages in a critical, responsible and creative manner	1.6	10.1	65.3	23.0
My level of media competency is adequate for co-habiting with media and technologies	1.2	8.1	60.1	30.6

*1 (none) **2 (little) ***3 (sufficient) ****4 (a lot).

The significant differences found in gender indicated that men communicated better as a function of the recipient (0.17). When attending a public school in the upper two academic years of high school (.018), they used, to a greater degree, computer programs to edit image sequences and create videos (.015), and were able to distinguish the sociopolitical tendencies of the media (.015).

Knowledge of Audiovisual Councils was greater in men (.031), while women had more information on the regulatory policy on intellectual property (.021). The students with a worse academic trajectory were not as worried about being up to date with technological and communicative resources that they could use in their academic tasks (.004).

Use of the computer for study and leisure had differences. In the first case, we found a negative correlation, where the lesser use of technological tools was related to a greater pre-disposition to relying on classical communication media (.000), and was shown to be less linked to the new technological media (.013). However, those who used the computer for more than three hours a day better differentiated the languages as a function of the final aim of the messages (.033), relied more on current communication media (.002), and were able to better distinguish the socio-political tendencies of the media (.009). For those students that used the computer for more than three hours a day for leisure, there was a positive correlation with their media competency in ten of the sixteen items considered, adding value to this habit.

3.2. Importance of media competency

The students indicated that it is important to know the risks of the Internet and the media in their social relationships, so that their importance should be dealt with when the information they provide is adequately managed. They also mention, to a lesser degree, the need to be a "prosumer", to be able to utilize the media in a responsible manner, access relevant information and relate in a more personal, social and professional manner. In any case, there were clusters that were not interested in understanding the superstructures of the media or being "prosumers", which is related to unawareness, deficiencies and opposition.

Table 3. Importance given to media competency by the students

Items	Results (%)			
	*1	**2	***3	****4
Embracing the importance of media in current society	1.6	2.8	42.3	53.2
Recognize the importance of media personally and socially	1.2	3.2	47.2	28.4
Understand the structure and superstructure of the media	1.6	17.3	52.0	29.0
Search for information that is consistent to my life	0.0	12.5	49.2	38.3
Understand the advantages of media use in my life	0.0	10.9	48.8	40.3
Recognize the risks of the Internet and the media in social relationships	1.2	10.5	31.5	56.9
Synthesize media information in an organized manner	1.2	7.7	48.4	42.7
Consume media in an ethical and responsible manner	1.6	7.3	51.2	39.9
Be able to use ICT in a technical capacity	1.6	12.9	47.6	37.9
Be able to use ICT in a critical capacity	1.6	10.1	49.6	38.7
Be a prosumer: producer and consumer of communication media	3.2	14.5	55.6	26.6

*1(none) **2 (barely) ***3 (sufficient) ****4 (very).

The significant differences found indicated that the students from the Business Engineering degree (.017) gave more importance to communication media in society, but granted less importance to searching for information that is important for their life (.002), being a prosumer (.000) and to consume media in an ethical and responsible manner (.028). Those who attended private/public subsidized centers in the last two years of high school granted less value to the media in their personal and social lives (.001), and those who had an excellent trajectory were interested in understanding the structures and superstructures of the media (.022), to look for information that was important for their lives (.017), to consume media in an ethical and responsible manner (.000) and to being prosumers (.013).

As for the use of the computer and the mobile phone for study and leisure, in all the significant differences found, a positive correlation between a greater use of these tools and an increase in the importance that is attributed towards media education, was confirmed.

3.3. Evaluation of the learning ecosystem (ECOFAE)

The 118 reports contributed by the students and the open-ended questions from the 808 questionnaires generated 2,400 paragraphs containing 73,425 words, which were used for content analysis.

– Catalogue 1. Strengths. 340 codes emerged. The aspects that were considered the most positive were the projects that were associated to specific thematic content or linked to real collaboration projects with socio-educational centers (inter-institutional relationships). In the same direction, we found the pedagogic visits, the increase in the participation with active methodologies of work in the classroom, and through tools available on campus and on the Web 2.0, teamwork, treatment of information in multiple formats, innovation, creativity, collaboration and the constructivist focus adopted by the professors.

• "The Snowball technique is very innovative, because we have seen that sharing with our classmate, the group, with the class and through the blog and Twitter allowed us to broaden our knowledge and what was commented in the social networks" (R.12.M.V.P.)

• "Project-based work favors collaboration between classmates, the ecosystem created is a novel way of being able to collaborate with each other…an example is when we share images in Twitter, when create entries in the blog, we upload all kinds of materials that we always have available" (R.6.F.IP.P.).

• "The project that a group presented, where they invited other professors and first-year students, where we changed classrooms according to the activity, where songs were presented, where performances were conducted, where everything that happened was recorded and directly uploaded to Twitter and the blog seemed to me a very clear example that things can be changed" (R.4.M.IP.P.).

– Catalogue 2. Weaknesses. There were 140 segments that were related to the difficulty in debating at the end of the sessions, the presentation time of the projects, the contents addressed, and the low level of coordination among the teaching staff.

The presentation of the ecosystem gave the students an initial anxiety, as it implied a change in the way that didactic relationships were commonly interpreted, although the students were conscious that this focus demanded from them a greater personal, team and collective commitment, as well as the development of proactive attitudes to deploy innovative, creative and co-responsible methodologies mediated by the ICT.

• "The drawback that I give the training ecosystem is that there was a lack of coordination with other courses, and I don't see that the Dean supports these actions either, because there are always problems with outings, for example" (R.7.F.IP.P.).

• "The way of working is different, it sensitizes you, because when you see images of what you do in class, of the pedagogic trips, activities outside of the classroom… I don't know how to explain it, it's different" (Q.55.F.IP.M.).

• "The methodology used to present ourselves, to speak in public from anywhere in the classroom, the fact that your classmates can support you if your mind is blank…all these things make you more secure in yourself and to evaluate the support provided by your classmates (…)" (R.21.F.IP.P.)

Table 4. Content analysis: evaluation of the training ecosystem model

D1	C2	Categories	Codes	fr3	F4	FT5
Ecosystem (E)	Strengths (S)	Collaboration (CB)	E-S-CB	(012)	(340)	720
		Constructivism (CO)	E-S-CO	(030)		
		Creativity (CR)	E-S-CR	(028)		
		Multi-format information (MI)	E-S-MI	(030)		
		Innovation (IN)	E-S-IN	(025)		
		Course manual (CM)	E-S-CM	(022)		
		Participation (PA)	E-S-PA	(033)		
		Presentation of content (PC)	E-S-PC	(032)		
		Projects (PR)	E-S-PR	(048)		
		Teamwork (TE)	E-S-TE	(035)		
		Pedagogic visits (PV)	E-S-PV	(045)		
	Weaknesses (W)	Intra-institutional coordination (IC)	E-W-IC	(030)	(140)	
		Support from the Dean (SDI)	E-W-SD	(022)		
		Unequal capacitation (UC)	E-W-UC	(013)		
		Self-assessment subjectivity (SA)	E-W-SA	(008)		
		Didactic Contracts (DC)	E-W-DC	(012)		
		Debate timing (DT)	E-W-DT	(031)		
		Internet Connection (IA)	E-W-IA	(019)		
	Improvements (I)	Triangulation of evaluation (TE)	E-I-TE	(023)	(240)	
		Institutional Support (IS)	E-I-IS	(037)		
		Professional projects (PP)	E-I-PP	(025)		
		Employment projections (EP)	E-I-EP	(030)		
		Graduate networks (GN)	E-I-GN	(015)		
		Previous training (FT)	E-I-FT	(025)		
		Advanced courses (AC)	E-I-AC	(023)		
		Optional tasks (OT)	E-I-OT	(022)		
		Public debates (PD)	E-I-PD	(025)		
		Group tutorships (GT)	E-I-GT	(015)		

D1: dimension; C2: catalogue; fr3: relative frequency; F4 : dimension frequency; FT5: total frequency.

– Catalogue 3. Improvements. 240 codes emerged. The following are highlighted: The need to increase the institutional support for the development of the projects, orient them to the real-life work environment and to Service-Learning, grant greater freedom in choosing of teams and projects, develop training courses when needed and change the way group tutorships are conducted, as an entire day could be used for them in order to share experiences with other classes or visit good-practices centers. The triangulation between evaluation, video-conferences and round tables with graduates, public debates or the solving of problems with technology are other necessary and logical demands if the implementation of training ecosystems in a generalized way is desired.

• "As an in-person student, I would like to be able to participate in service-learning, at least through technological tools" (R.16.M.IP.P.).

• "In the beginning, I, as well as other classmates, had problems adapting and working with the ecosystem's tools, as we were unaware about their existence. It would be good if we could have had previous training" (R.42.F.IP.P.).

• "The work that we have done within the ecosystem could be more useful if the professors were coordinated with each other, and if we had access to practice sessions and contacts with professional workers through the social networks" (R.33.F.IP.M.).

4. Discussion and conclusions

The results obtained indicate that the blended-learning training ecosystems develop media competency in the Bachelor's degrees and are well-accepted by the student body. They are presented as an attractive proposal that requires an initial high investment of energy in time and dedication, but can provide benefits associated to the development of professional competency, inter-disciplinarity and media literacy. The implementation of the model is backed by the greater self-perception that the students had on their media education and by the importance they granted to the need to bolster literacy in the field of knowledge as a transversal competency in university studies. Therefore, the models should be institutionally backed in the study plans so that they are integrated into organizational cultures in order to answer to the needs of the users, the professional workers and society, in agreement with contributions by other authors (Tello & Aguaded, 2009). The differences found between degrees and faculties

evidence the good self-perception of the students on their media competency, in line with other research works (González-Fernández, Gozálvez-Pérez, & Ramírez-García, 2015), who highlighted the positive impact of active methodologies and the use of digital technologies in the development of this competency.

The over-valuation that the students granted their media competency was the result of their restricted view of the use of tools and programs for relating or informing themselves, as these (simple) actions do not imply a true literacy that can turn them into true prosumers. The study shows a positive correlation where it was evident that the greater the amount of time using computer systems and mobile phones for school-related tasks and leisure, the better self-perception was of media competency. This is also what occurred when the students developed group projects relying on principles that guided training ecosystems, as the processes of blended-learning teaching-learning that were created, favored media competency, the creation of professional communities and the relationships with the labor market.

A training ecosystem that is oriented towards the development of media competency increases the user's satisfaction, independently of its initial demands. Its potential is expanded when it becomes part of the organizational culture under the auspices of the institution, as indicated by other authors (Gewerc, Montero, & Lama, 2014; Senge, 1990). The planning, design, methodologies, resources, tasks and the commitment of its sponsors has a positive effect on the participants when they work on projects that are technologically-based and oriented towards media education (García-Ruiz, Ramírez-García, & Rodríguez-Rossell, 2014).

The problems detected warn us to develop proposals of continuous improvement that could become the benchmark that guides us through the construction of future ecosystems. Therefore, the need for previous training of the users –the staff, professional workers and students–, the infrastructures, the improvement of evaluations systems, the mechanisms of coordination inside and outside of our institutions, and the institutional backing, should be attended to if we want to promote blended-learning training ecosystems in a coherent and holistic manner.

The deployment of the training ecosystems mediated by technology is significant in its use of time and resources, but it can orient processes of change in those Higher Learning institutions where ambiguity of objectives, decoupling and diversity of interests dominate over collaboration, innovation and continuous improvement. The objective of education in the 21st century is to train generations of citizens in media competency, which implies incorporating into the curriculum, in a transversal manner, a process of literacy for everyone throughout their lifetimes, so that they are fully competent in the access, interpretation and re-utilization of varied and multiple digital ways of representation of information and knowledge.

Funding agency

This research study was conducted within the framework of the Research Project "Design, Implementation and International Evaluation of Blended-learning Training Ecosystems in Higher Education (cod. PAIN1-10-001)", granted by the University of Oviedo, and has relied on advice from the Innovation Acceleration Platform "Innobridge", with headquarters in Lausanne (Switzerland).

References

Aguaded. I. (2012). La competencia mediática, una acción educativa inaplazable. [Media Proficiency, an Educational Initiative that Cannot Wait]. *Comunicar*, *39*, 7-8. https://doi.org/10.3916/C39-2012-01-01

Álvarez-Arregui, E., & Rodríguez-Martín, A. (2013). *Gestión de la formación en las organizaciones desde una perspectiva de cambio. Principios básicos y estrategias de intervención*. Oviedo: Ediuno.

Area, M. (2012). Sociedad líquida, Web 2.0 y alfabetización digital. *Aula de Innovación Educativa*, *212*, 55-59.

Buckland, R. (2009). Private and Public Sector Models for Strategies in Universities. *British Journal of Management*, *20*(4), 524-536. (http://goo.gl/bPvxVt) (2016-11-25).

Caldeiro-Pedreira, M.C., & Aguaded, I. (2015). Alfabetización comunicativa y competencia mediática en la sociedad hipercomunicada. *Revista Digital de Investigación en Docencia Universitaria*, *9*(1), 37-56. https://doi.org/10.19083/ridu.9.379

Cano, R. (2009). Tutoría universitaria y aprendizaje por competencias ¿cómo lograrlo? *Revista Interuniversitaria de Formación del Profesorado*, *12*, 181-204. (http://goo.gl/SwlBry) (2015-11-11).

Carrascosa, J. (2005). La evaluación de la docencia en los planes de mejora de la Universidad. *Educación XXI*, *8*, 87-101. (http://goo.gl/J5E1gP) (2015-10-04).

Castells, M. (1999). *La era de la información. Fin de milenio*. Madrid: Alianza.

Chang, V., & Lorna, U. (2008). Governance for e-learning Ecosystem. In E. Chang, & F. Hussain (Ed.), *II IEEE International Conference on Digital Ecosystems and Technologies,* 340-345. Phitsanulok (Thailand): Institute of Electrical and Electronics Engineers.

DeJaeghere, J. (2009). Critical Citizens Education for Multicultural Societies. *Interamerican Journal of Education and Democracy, 2*(2), 223-236. (https://goo.gl/XxOUBT) (2015-11-22).

Dimitrov, V. (2001). Learning Ecology for Human and Machine Intelligence: A Soft Computing Approach. *Studies in Fuzziness and Soft Computing*, *81*, 386-393. (http://goo.gl/TgXmvW) (2016-11-01).

Entwistle, N., & Tait, H. (1990). Approaches to Learning, Evaluations of Teaching, and Preferences for Contrasting Academic Environments. *Higher Education*, *19*, 169-194. (http://goo.gl/MKbfrs) (2016-08-09).
Fedorov, A. (2014). Media Education Literacy in the World: Trends. *European Researcher*, *67*(1-2), 176-187. https://doi.org/10.13187/issn.2219-8229
Ferrés, J., & Masanet, M.J. (Coords.) (2015). *La educación mediática en la universidad española*. Barcelona: Gedisa.
García-Galera, M.C. (2013). Twittéalo: la Generación Y su participación en las redes sociales. *Crítica*, *985*, 34-37. (http://goo.gl/5DbdM9) (2015-11-27).
García-Ruiz, R., Ramírez-García, A., & Rodríguez-Rosel. M. (2014). Educación en alfabetización mediática para una nueva ciudadanía prosumidora. [Media Literacy Education for a New Prosumer Citizenship]. *Comunicar, 43*, 15-23. https://doi.org/10.3916/C43-2014-01
Gewerc, A., Montero, L., & Lama, M. (2014). Colaboración y redes sociales en la enseñanza universitaria [Collaboration and Social Networking in Higher Education]. *Comunicar*, *42*, 55-63. https://doi.org/10.3916/C42-2014-05
Gimeno-Sacristán, J. (2001). *Educar y convivir en la cultura global*. Madrid: Morata.
Gimeno-Sacristán, J. (2008). *Educar por competencias. ¿Qué hay de nuevo?* Madrid: Morata.
González-Fernández, N., Gozálvez-Pérez, V., & Ramírez-García, A. (2015). La competencia mediática en el profesorado no universitario. Diagnóstico y propuestas formativas. *Revista de Educación*, *327*, 117-146. https://doi.org/10.4438/1988-592X-RE-2015-367-285
Gozálvez-Pérez, V., González-Fernández, N., & Caldeiro-Pedreira. M.C. (2014). La competencia mediática del profesorado: un instrumento para su evaluación. *Revista Electrónica de Investigación Educativa*, *16*(3), 129-146. (http://goo.gl/x3UD69) (2015-11-19).
Gozálvez, V. (2013). Ciudadanía mediática. Una mirada educativa. Madrid: Dykinson.
Gütl, C., & Chang, V. (2009). Ecosystem-based Theorical Models for Learning in Environments of the 21st Century. *International Journal of Emerging Technologies in Learning*, *7*, 1-11. (http://goo.gl/IhZOwg) (2015-12-14).
Huber, G.L., & Gürtler, L. (2013). *Aquad 7. Manual del programa para analizar datos cualitativos.* Tübingen: Softwarevertrieb.
Ismail, J. (2001). The Design of an e-Learning System beyond the Hype. *Internet and Higher Education*, *4*(3-4) 329-336. (http://goo.gl/rqLPzA) (2015-12-17).
Kolloffel, B., Eysink, T., & Jong, T. (2011). Comparing the Effects of Representational Tools in Collaborative and Individual Inquiry Learning. *Computer-Supported Collaborative Learning*, *6*, 223-235. https://doi.org/10.1007/s11412-011-9110-3
León, B., & Latas, C. (2005). Nuevas exigencias en el proceso de enseñanza-aprendizaje del profesor universitario en el contexto de la convergencia europea: la formación en técnicas de aprendizaje cooperativo. *Revista Interuniversitaria de Formación del Profesorado*, *8*(6), 45-48. (http://goo.gl/h3hT6l) (2015-11-18).
Monereo, C. (2009). *Pisa como excusa. Repensar la evaluación para cambiar la enseñanza*. Barcelona: Graó.
Ramsden, P., Martin, E, & Bowden, J. (1989). School environment and sixth form pupils' approaches to learning. *British Journal of Educational Psychology*, *59*(2), 129-142. https://doi.org/10.1111/j.2044-8279.1989.tb03086.x
Rodríguez-Martín, A., & Álvarez-Arregui, E. (2014). Estudiantes con discapacidad en la Universidad. Un estudio sobre su inclusión. *Revista Complutense de Educación 25*(2), 457-479. https://doi.org/10.5209/rev_RCED.2014.v25.n2.41683
Sánchez-Gómez, M.C., & García-Valcárcel, A. (2002). Formación y profesionalización docente del profesorado universitario. R*evista de Investigación Educativa*, *20*(1), 153-171. (http://goo.gl/1sJr9n) (2016-11-30).
Sánchez, J., & Contreras, P. (2012). De cara al prosumidor. Producción y consumo empoderando a la ciudadanía 3.0. *Icono 14*, *10*(3), 62-84. https://doi.org/10.7195/ri14.v10i3.210
Senge, P.M. (1990). The Fifth Discipline. *The Art and Practice of the Learning Organization*. New York: Dobuleday.
Shimaa, O., Nasr, M., & Helmy, Y. (2011). An Enhanced E-Learning Ecosystem Based on an Integration between Cloud Computing and Web 2.0. *International Conference on Digital Ecosystems and Technologies.* Seoul: Dejeon.
Shrivastava, P. (1998). *Knowledge Ecology: Knowledge Ecosystems for Business Education and Training.* Lewisburg: Bucknell University Press.
Tello, J., & Aguaded, I. (2009). Desarrollo profesional docente ante los nuevos retos de las Tecnologías de la Información y la Comunicación en los centros educativos. *Pixel-Bit*, *34*, 31-47. (http://goo.gl/IpE3Oy) (2016-11-08).
Toffler, A. (1980). *La tercera ola*. Barcelona: Plaza & Janes.
Uden, L., Wangsa, I.T., & Damiani, E. (2007). The Future of e-Learning: E-learning Ecosystem. *Digital EcoSystems and Technologies Conference*, *7*, 113 -117. https://doi.org/10.1109/DEST.2007.371955
Zabalza, M.A. (2002). *La enseñanza universitaria. El escenario y sus protagonistas*. Madrid: Narcea.

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Revista Científica Iberoamericana de Comunicación y Educación

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www.revistacomunicar.com
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ISSN: 1134-3478 / e-ISSN: 1988-3293