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DOSSIER "EDUCATION AND TECHNOLOGY IN MEXICO AND LATIN AMERICA: OUTLOOK AND CHALLENGES

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DOSSIER

Education and Technology in Mexico and Latin America: Outlook and Challenges. Introduction

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Abstract

With an increasing number of young people reaching university entrance age, *the demographic reality of Latin American countries is changing the face of their traditional higher education spaces.* The impact is driving institutions to seek effective solutions, and technology has been identified as a 'way forward' in terms of offering education to the growing population of young people who want it. Technology-mediated education must therefore help to improve Latin American citizens' quality of life.

In Mexico, and since 2010, the National System of Distance Education (SINED) – an initiative led by universities interested in strengthening education mediated by information and communication technologies (ICTs) – has been exploring ways to incorporate these tools into the evolution of Mexican and, by extension, Latin American universities.

This monographic Dossier, produced in conjunction with RUSC. Universities and Knowledge Society Journal, is part of the SINED's effort to progress towards generating information, documentation and materials to support the academic community involved in ICTs and innovation from a number of angles, including use, learning and research. In order to achieve the objectives set, it is important to

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support and disseminate effective initiatives in and consolidated experiences of using and applying technologies to university education contexts, and also to foster the emergence of spaces that are open to the agents of the educational community for disseminating and sharing their experiences of technologies in education.

Keywords
Latin America, educational innovation, successful cases, knowledge spaces

Educación y tecnología en México y América Latina. Perspectivas y retos

Resumen

La realidad demográfica de los países latinoamericanos, con un número creciente de población joven en edad de cursar estudios universitarios, está alterando sus espacios tradicionales, impactando en ellos. Esto lleva a las instituciones a buscar soluciones eficaces; de este modo, se ha identificado la tecnología como una «salida» para ofrecer la formación que esta creciente población joven demanda. Por tal razón, la educación mediada por la tecnología debe contribuir a mejorar la calidad de vida de los ciudadanos latinoamericanos.

En el caso mexicano, y desde 2010, el Sistema Nacional de Educación a Distancia (SINED), surgido como una iniciativa impulsada desde las universidades interesadas en fortalecer la educación mediada por las tecnologías de la información y de la comunicación (TIC), explora vías para la incorporación de estas herramientas en el devenir universitario mexicano y, por extensión, latinoamericano.

El presente monográfico elaborado conjuntamente con RUSC es parte del esfuerzo que SINED realiza para avanzar en el camino de generar información, documentación y material de apoyo para la comunidad académica que está inmersa en el uso, el aprendizaje y/o la investigación en TIC e innovación educativa. Para avanzar en los objetivos fijados, es importante apoyar y difundir iniciativas eficaces y experiencias consolidadas de uso y aplicaciones tecnológicas en los contextos educativos universitarios, así como favorecer la aparición de espacios abiertos a los agentes de la comunidad educativa para la difusión y puesta en común de sus experiencias con las tecnologías en educación.

Palabras clave

Latinoamérica, innovación educativa, casos de éxito, espacios de conocimiento

The Mexican National System of Distance Education (SINED) was created in 2010 as an initiative led by Mexican universities interested in strengthening education mediated by information and communication technologies (ICTs). The SINED's mission is to help raise the quality, coverage and equity of education in Mexico through the institutionalisation of educational social networks, and also to work towards using, integrating, developing and disseminating innovative educational technologies, products and services that promote knowledge generation and management for economic growth and social wellbeing.

The SINED has been unwavering in its commitment to become a hub and an instrument for consolidating technology-mediated education, a vocation that has a promising future because, in Mexico and Latin America, this mode has advanced significantly in recent decades. Despite this

progress, it has had to surmount several major obstacles (and continues to do so) to become an education policy instrument that is capable of mitigating the gap in education, fostering lifelong learning and assuring the quality of courses in higher and postgraduate studies. In short, technology-mediated education must help to improve Latin American citizens' quality of life.

Universities are under great pressure to provide coverage in countries like Mexico, where the impact of the demographic bonus on traditional higher education spaces is rendering them insufficient for satisfying demand; quite rightly, these institutions see technology as a 'way forward' in terms of offering professional training to the growing population of young people who want it. However, the lack of planning, sustainability and knowledge about the characteristics, needs and requirements of technology-mediated education tends to raise false expectations and ultimately leads to poor results.

Regarding digital competency, for example, many Latin American countries are marked by a series of contrasts and contradictions, as well as endless problems associated with unequal access to technology: the most modern institutions located in big cities allow practically every student to make digital spaces part of their daily learning environment, irrespective of whether or not they physically attend a university. Consequently, there is a need to analyse what is actually happening with interactions of various types, including those between students and their learning environments, between students and their lecturers, and between students and their fellow students.

At the opposite end of the scale are university institutions located outside capitals or big cities. While not benefitting from the same financial advantages as the others, they are often subject to the centrally designed and implemented demands of providing the same coverage, education and academic quality. Such institutions manage to survive on very few resources and very few or hardly any digital competency options for their students or teaching staff.

It is clear to see that this mode of education presents many challenges, and perhaps the most obvious ones are those relating to the problems associated with technology and telecommunications infrastructure that, coupled with the cost of that infrastructure, are generically known as the 'digital divide'. Other problems include those connected with higher education models, laws and regulations that either permit or prevent this mode from becoming a real, quality alternative for thousands of young people and adults that want to carry on studying, for whom traditional face-to-face education is not really an option.

The efforts made by *RUSC* and the SINED in publishing this special issue were motivated by several successful cases in this field, by innovative visions dealing assertively with these and other problems, and by the wealth of analysis that may provide new knowledge for dealing with Latin American educational realities from angles that, up till now, have barely been explored, disseminated or documented.

Communicating the current state of ICT interaction and of education in innovative environments both nationally and internationally, and in the Ibero-American sphere in particular, is of vital importance now more than ever, especially because of the increasingly heady rate at which technology is being incorporated into citizens' formal and non-formal education.

At the present time, generating knowledge that deals with the relevance and rigour of incorporating the latest generation of technological devices into learning environments is a major

challenge. So too is seriously evaluating their impact on information processing and on their users' cognitive development. Analysing these and other topics has become an increasingly pressing task if the aim is to ensure that educational innovation does not continue to lag behind the processes of teaching, learning and developing technological skills.

In publishing this monographic Dossier, some of the objectives of the *RUSC*-SINED alliance are: to generate information, documentation and materials to support those who are already involved in ICTs and innovation from a number of angles, including use, learning and research; to support and disseminate effective initiatives in and consolidated experiences of using and applying technologies to university education contexts; and, in short, to offer open spaces to the agents of the educational community for disseminating and sharing their experiences of technologies in education. The academic rigour of this monographic Dossier allows for the generation of new knowledge and the dissemination of many Latin American experiences currently being undertaken in the field of technology-mediated education.

Finally, for the SINED, this monographic Dossier represents a space for reflection on and analysis of education policy and its relationship with technology. Furthermore, it is an opportunity to document and share the efforts and actions being taken by many higher education institutions and research centres in Latin America.

After anonymous peer review, *RUSC*'s Scientific Editorial Board selected the five articles that make up the monographic Dossier. These are briefly presented below.

"Challenges and perspectives for the open education movement in the distance education environment: a diagnostic study in a SINED project", an article by María Ramírez, offers us an analysis of the adaptation to the Mexican environment of the successful case that is the Regional Open Latin American Community for Social and Educational Research (CLARISE). The role of open educational resources (OERs) in open educational practices (OEPs) is one of the focal points of this project, which involved 255 participants from 12 Latin American and European countries. In the article, the author studies the use of OERs in technology-mediated environments in nine Mexican institutions and, in her conclusions, suggests several challenges and opportunities for the use of OERs and the development of OEPs in online education environments in Mexican universities.

In their article "Pedagogical models, collaborative work and interaction on online undergraduate programmes in Colombia: still some way to go", Clelia Pineda Báez, Cristina Hennig and Yasbley Segovia examine the experiences and perceptions that students, lecturers/tutors and coordinators have of the pedagogical models used in the online programmes of six Colombian higher education institutions. The aim is to explore the different views of the pedagogical models used and to find out how they have been implemented in pedagogical practice, using qualitative and quantitative techniques. The conclusions point to problems arising from the existence of institutional pedagogical models that are conceived as ideal, which generate ambiguity in the development of the concept of collaborative work and limit such work to the formation of work groups and the distribution of tasks, thus hindering interaction among the participants.

In "Cooperation for institutional strengthening: shared knowledge in the quest for improved teaching", Almudena Alonso presents some of the results obtained over the lifetime of a four-year

institutional cooperation project. Like the case presented by the SINED, this article refers to an experience of prior collaboration in a network called Universities for the Information and Knowledge Society (UNISIC), in which six Latin American universities have been working together since 2006.

The main aim of the four-year project, which has now ended, was to incorporate technologies into one of the institutions, with emphasis on improved teaching. The task of implementing the project was divided into five different programmes, in which lecturer training, educational technology research and technology investment were interrelated. In the article, the author highlights a number of important aspects for the success of a project of this magnitude, such as an open knowledge approach, opting for open source software, the (often overlooked) fact that the infrastructure has to be suited to the real needs of the users, long-term changes in institutional cultures, and project support.

As the author points out, summarising such a complex project is a difficult task. However, the summary she provides allows several useful guidelines to be gleaned from the results obtained for implementing similar actions in other institutions.

"Latin American university students' perceptions of social networks and group work", an article by Verónica Marín and Julio Cabero, analyses university students' levels of knowledge of social networks and their perceptions of group work, by means of a study conducted on a sample of 1,040 students from 7 higher education institutions in 4 Latin American countries. As the authors point out, it is practically impossible to offer or gain a university education without it involving ICTs, though e-learning may be hindered by the students' sociocognitive isolation. It is on this particular point that collaborative group activities can help to create environments that are more active, hence the importance of knowing what the students' attitudes towards them are.

The authors set several objectives. The first is to identify the students' perceptions of social software and of collaborative group work (in comparison to individual work). The also analyse whether the country of provenance gives rise to any differences in the above-mentioned perceptions. Lastly, they aim to identify the social tools that the students' use the most.

The discussion of the results obtained puts forward several ideas for the incorporation of different strategies and ICTs into e-learning, which deserve to be taken into account by Latin American academic managers, in their efforts to incorporate technologies into higher education.

In "Twitter's contribution to improving strategic communication in Latin American universities", Alba Patricia Guzmán and María Esther del Moranos present a study examining universities' Twitter use. Despite imposing a limit of 140 characters per post, this microblogging service forms part of hundreds of millions of people's daily lives, and universities are not immune to this reality.

By means of a study of the institutional accounts of 263 Latin American universities, the authors analyse the use made of this tool for strategic communication purposes. In the discussion, the community manager figure emerges as a key element for effective Twitter use in institutional communication strategies and, in the conclusions of this quantitative study, the authors point to the variability of its use in universities, and also to the existence of two priority trends for its use.

As co-editors of this monographic Dossier, we would like to thank the participating authors and reviewers for their help in preparing it, for meeting the deadlines set and, consequently, for enabling this issue of *RUSC* to reach the scientific community on time.

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Finally, we would like to express our gratitude to Elsa Corominas, *RUSC*'s editorial secretary, for her assistance throughout the editorial process associated with this monographic Dossier, and to Steven Norris, MITI, the translator and copy editor for the English edition.

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Since it was formed, he has been a member of the expert research group that has collaborated with the ICT Analysis and Planning Working Group of the Conference of Spanish University Rectors (CRUE) on the elaboration of the report on ICTs in the Spanish university system, the seventh edition of which is about to be published.

He is a member of the Editorial Board of *RUSC. Universities and Knowledge Society Journal* published by the UOC, of the Scientific Review Board of the journal *Comunicar* and a founding member of the Spanish University Network of Virtual Campuses (RUCV) association.

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Dossier "Education and Technology in Mexico and Latin America: Outlook and Challenges"

ARTICLE

Challenges and perspectives for the open education movement in the distance education environment: a diagnostic study in a SINED[1] project

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Abstract

The aim of this article is to present an analysis of challenges and perspectives through a project supported by the Mexican National System of Distance Education (SINED) and based on a successful case called the Regional Open Latin American Community for Social and Educational Research (CLARISE). The CLARISE for Distance Education project (2012-2013) seeks to generate knowledge on teaching models in accordance with distance education needs and a competency-based training approach, by means of networking activities that progress through three phases (diagnosis, training, implementation). This article focuses on the first phase. Having conducted a diagnostic survey of 40 participants from 9 Mexican institutions, it presents a descriptive exploratory study into 4 areas: identification data, the open education movement, distance education and innovation competencies, and networks. The purpose of the study was to devise the actions that would need to be carried out as a research group in the field of distance education. The challenges were identified in three areas: (a) institutional policies for open access; (b) knowledge management and communication; and (c) cultures of collaboration. The perspectives could be opened up by: (a) facilitator training for competency development; (b) innovative models with open access systems; and (c) mobilisation through innovation networks.

Keywords

open education movement, innovation, distance education, educational challenges, open access, digital competencies

Retos y perspectivas en el movimiento educativo abierto de educación a distancia: estudio diagnóstico en un proyecto SINED

Resumen

El objetivo de este artículo es presentar un análisis de retos y perspectivas a través de un proyecto apoyado por el Sistema Nacional de Educación a Distancia (SINED) y que tiene sus antecedentes en un caso de éxito de la Comunidad Latinoamericana Abierta Regional de Investigación Social y Educativa (CLARISE). El proyecto CLARISE para la educación a distancia (2012-2013) busca generar conocimiento en torno a modelos de enseñanza acordes con las necesidades de la modalidad a distancia y el enfoque de formación en competencias, a través de las actividades de una red, en tres etapas (diagnóstico, formación, implementación). Este artículo se enfoca en la primera etapa, donde se presenta un estudio exploratorio-descriptivo, con un diagnóstico de cuarenta participantes de nueve instituciones mexicanas, que indagó en cuatro dominios: datos de identificación, movimiento educativo abierto, competencias en educación a distancia e innovación y redes. Todo para proyectar las acciones que realizar como grupo de investigación en el ámbito de la educación a distancia. Los retos se vislumbran en tres niveles: (a) políticas institucionales para el acceso abierto, (b) gestión y comunicación del conocimiento y (c) cultura de colaboración. Las perspectivas se abren a través de: (a) formación de facilitadores para el desarrollo de competencias, (b) modelos innovadores con sistemas de acceso abierto y (c) movilización a través de redes e innovación.

Palabras clave

movimiento educativo abierto, innovación, educación a distancia, retos educativos, acceso abierto, competencias digitales

Introduction

Educational offerings in distance education mode have increased in higher education institutions in Mexico, and are made available through a variety of programmes: support courses for face-to-face learning, blended learning programmes, fully distance learning programmes supported by technological platforms and resources, and continuing education programmes. In parallel to the growth in distance education, governments, international organisations such as the Organisation for Economic Co-operation and Development (OECD, 2007) and the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2002-2012), and education institutions have promoted various initiatives to produce, disseminate and share digital materials known as open educational resources (OERs) that support academic and research activities. While OERs are materials that can be used to support educational processes, there is still very little awareness of them among the educational community in Latin America, particularly in Mexico.

In the Latin American environment, the development of networked projects to mobilise educational practices was considered necessary. Thus, under the CLARA Communities 2011 (COMCLARA 2011) programme, an international project was approved in 2011 to create the research community called the Regional Open Latin American Community for Social and Educational Research (CLARISE, https://sites.google.com/site/redclarise/), which, in its initial stage, involved 27 researchers from 5 countries: Argentina, Costa Rica, Uruguay, Colombia and Mexico. The organisation and coordination of this community was undertaken in Mexico, thus placing it at the forefront of the open movement in the Latin American region. The CLARISE case is considered a successful example because of the activities that were carried out in the Latin American sphere and effectively extended to Europe, specifically in the Ibero-American sphere.

An interest emerged from this experience in promoting the topic of the open education movement in the distance education environment, and that was how academics from nine Mexican institutions came to participate in the national call for applications issued by the Mexican National System of Distance Education (SINED) for the institutionalisation of the SINED's electronic networks (SINED-cn-02/12). This resulted in the approval of the CLARISE for Distance Education project, which would be developed in the 2012-2013 period.

The aim of the SINED-CLARISE for Distance Education project is to generate knowledge on teaching models in accordance with distance education needs and a competency-based training approach, by creating integrated projects in which researchers and lecturers specialising in distance education can pool their know-how and experiences. At the same time, the aim is to create a collaborative area that serves as a platform for research into and the development of the open education movement's capacities in order to foster the use of knowledge (academic and scientific outputs) that is openly accessible on the Internet, and to support the improvement of educational practices in distance education institutions.

The specific aim of this article is to analyse the challenges and perspectives identified in the first stage of the project, based on a diagnostic survey of the participants, in order to devise the actions that would need to be carried out as a research group in the field of distance education. The article

is divided into five sections: a description of the context, the theoretical framework, the method, the results and the discussion.

1. Context

The SINED-CLARISE for Distance Education project is based on a successful case called CLARISE (Figure 1). CLARISE emerged in 2011, with the collaboration of research lecturers involved in the national Internet-based networks of their respective countries. The aim is to attend to the Latin American regional need to unite efforts by creating collaboration and learning networks in order to raise the visibility of and provide open access to the cultural, scientific and academic outputs of Latin American authors and institutions, which are freely available to everyone. The main research topic is the open education movement in general, and OERs in particular.

Figure 1. CLARISE website (https://sites.google.com/site/redclarise/)

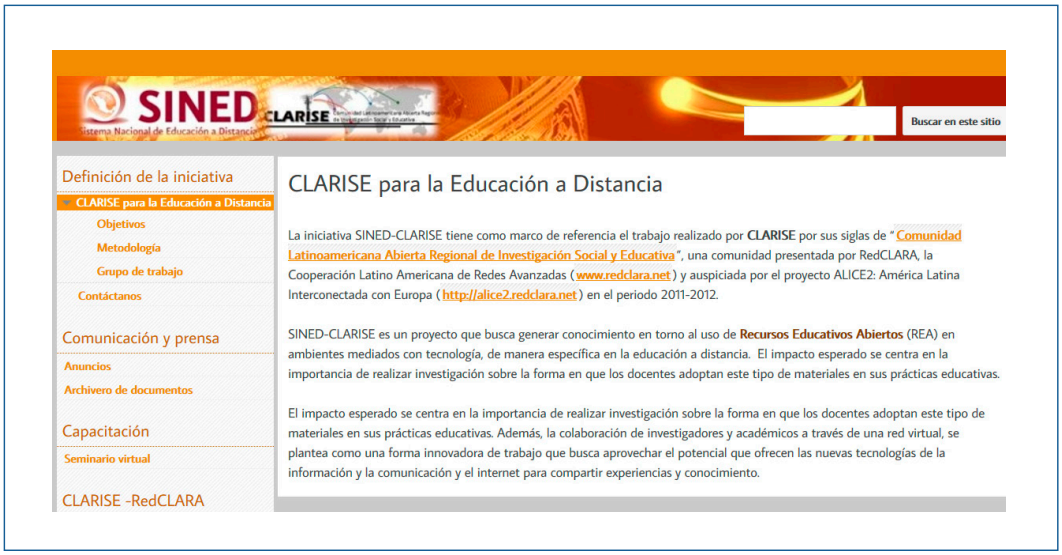
The CLARISE network is working on studies that report on the application of OERs, cultures of collaboration and open educational practices (OEPs). Of particular note among its activities is the open education movement's webinar, which had 255 participants from 12 Latin American and European countries. Several associated networks have been crucial to CLARISE's development, such as the CLARA Network (Red CLARA), the ALICE2 Latin America Interconnnected with Europe Project (Proyecto ALICE2), the Corporation of Universities for Internet Development (CUDI), the National Academic Network for Advanced Technology (RENATA), the Argentinean National Research Network (INNOVA RED) and the Uruguayan Academic Network (RAU2). The network's activities have been disseminated through various publications (Burgos & Ramírez, 2011; Glasserman, 2012; Nappa & Pandiella, 2012; Peré, 2011; Ramírez, 2012a; Ramírez & Burgos, 2011 [coords], 2012; Salazar, Rodríguez & Campos, 2012; Waisman & Olivares, 2011) and participating institutions' newsletters and websites.

With the experience gained and results obtained from this Latin American network, a decision was taken to participate in an affiliated network to bring distance education innovations together; that was how, in 2012, SINED supported the creation of CLARISE for Distance Education (Figure 2). Nine institutions participated in the initial project:

- Guanajuato Official Normal School of Higher Education (ENSOG)
- Chihuahua Institute of Technology (ITCh)
- Sonora Institute of Technology (ITSON)
- Monterrey Institute of Technology and Higher Education (Monterrey Tec)
- Autonomous University of Baja California (UABC)
- Autonomous University of the State of Mexico (UAEM)
- Autonomous University of Yucatán (UADY)
- University of Montemorelos (UM)
- Autonomous University of Guadalajara (UAG)

The Chalco Institute of Technology and Higher Education (TESCHA) joined later, but, for the purposes of this article, the data refer to the initial nine institutions that took part in the diagnostic survey.

Figure 2. CLARISE for Distance Education website (https://sites.google.com/site/sinedclarise/).



The project seeks to generate knowledge on the use of OERs in technology-mediated environments and to support practice innovation, specifically in distance education. In addition, collaboration among researchers and academics via an online network is considered to be an innovative way of working that seeks to make full use of the potential of information and communication technologies (ICTs) and the Internet for sharing experiences and knowledge. Thus, the first question addressed in this article is: What challenges and perspectives can be identified for the open education movement in the distance education environment?

2. Theoretical framework

Distance education and competency development. The impact of incorporating technologies into learning environments is undeniable, and several emergent changes can be identified in ways of learning and, ultimately, in ways of teaching. Distance education emerged in response to the considerable rise in demand for places in higher education, due to the growth in the numbers of people gaining qualifications at lower educational levels and the need to make teaching-learning models more flexible. In distance education, many higher education institutions are now offering courses, bachelor's degrees and postgraduate studies (Guthrie & McCracken, 2010; ANUIES, 2001). Cabero (2008) noted that distance education had gone from being a mode with little social acceptance to an option with great potential, to which considerable effort and financial resources were being devoted.

Certain strategies can undoubtedly help to strengthen education systems, particularly in distance education, such as: creating a culture that is open to ICTs by means of training; creating national and Latin American inter-institutional collaboration networks; and forming regional multidisciplinary teams of researchers to contribute knowledge on the topic, for the purposes of developing new policies (Facundo, 2002). Likewise, when faced with the demands of the knowledge society, it is important to bear in mind that education systems need to change to ensure the effective inclusion of human resources in a complex society. From the perspective of complex thinking, competency-based training is one of the approaches that education seeks to express (Tobón, 2006).

In order to understand the teaching-learning process, it is essential to identify the competencies that its protagonists – teachers and students – should either have or develop. Although work has been done on selecting and defining teaching competencies for many years (Sugumar, 2009), the task cannot be considered simple or complete. However, the works by Zabalza (2003) and Perrenoud (2004), to name but a few of the authors who have proposed categories for describing teaching practice, do indeed provide the basis for a guide of competencies that characterise the profession. Some of these competencies are a knowledge of the curriculum and its content, the ability to communicate and interact with students, and the development of instructional designs or plans.

Regarding students' competencies, the Tuning América Latina project – involving 19 universities across Latin America – defines 27 general competencies (Tuning América Latina, 2008) that students at higher education institutions should develop in the course of their education, some of which are the ability to abstract, analyse and summarise; the ability to apply know-how in practice; the ability to plan and organise time; the ability to communicate in writing; the ability to do research; the ability to learn and keep abreast of new developments; the ability to look for, process and analyse information from a variety of sources; the ability to identify, frame and solve problems; the ability to work in teams; and the ability to work independently.

In distance education, teachers' and students' competencies come together in an integrated learning model or integrating project where online media serve as the platform for raising and solving problems (Medina-Rivilla, Domínguez-Garrido & Sánchez-Romero, 2008; Guohong, Ning, Wenxian & Wenlong, 2012). This is how the know-how, skills and attitudes of the actors in the education process are 'mobilised' to transform the learners' environment.

Open education movement and the development of OEPs. One of the branches of the open education movement focuses on the production, dissemination and reuse of OERs. In 2002, UNESCO coined the concept of OERs. The William and Flora Hewlett Foundation defines them as "teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use or re-purposing by others. Open educational resources include full courses, course materials, modules, textbooks, streaming videos, tests, software, and any other tools, materials, or techniques used to support access to knowledge" (Atkins, Brown & Hammond, 2007, p. 4; Tuomi, 2013; Gurell, Kuo & Walker, 2010).

Today, projects for the creation, use and transformation of OERs are being promoted all over the world, as is the development of repositories and catalogues for their storage and classification. Some of the best-known examples are OpenCourseWare (OCW) from the Massachusetts Institute of Technology (MIT), Rice University, Carnegie Mellon University (CMU) and Yale University in the United States; China Open Resources for Education (CORE); the Japanese OCW Consortium; and the Paris Tech OCW project (OECD, 2007). In Mexico, Monterrey Tec stands out as an institution that has developed several projects, including the creation of the Temoa OER portal, the publication of academic content on MIT-OCW, the creation of the repository called DAR (Develop, Learn and Reuse), which stores studies and OERs, and the publication of e-books, among other initiatives (Burgos & Ramírez, 2011). Also worthy of note are the efforts made by the UAEM and the National Autonomous University of Mexico (UNAM) to disseminate knowledge via the Redalyc network and the SciELO online library (Aguado, Rogel, Becerril & Baca, 2009).

However, despite the efforts made, the use of OERs in educational practice is still in its early stages. Some of the reasons for this are the lack of development of technology-use competencies (OECD, 2007; Ochoa & Duval, 2009; Minguillón, 2010; Lane & McAndrew, 2010); the constraints of OERs due to the language, content and cultural traits of their producers, who are based mostly in English-speaking institutions (Amiel, 2013; D'Antoni, 2007, 2009; Baaren & Vries, 2010; Davis, 2010); and mistrust stemming from the lack of licensing arrangements to ensure that copyright is respected (Atkins et al., 2007; D'Antoni, 2007; Davis, Carr, Hey et al., 2010). In this context, the Open Educational Quality Initiative (OPAL) has suggested that efforts should be focused on the development of OEPs, and describes them as "a set of activities around instructional design and implementation of events and processes intended to support learning" (OPAL, 2011, p. 13).

Consistent with these initiatives, the open education movement is conceived as open access educational activities that are conducive to a range of educational practices: the use of OERs available on the Internet; the production of materials with open licenses; the selection of OERs via repositories and links that serve as OER catalogue infomediaries; the dissemination of practices in academic, governmental and institutional environments, etc.; and mobilisation towards educational practices (Ramírez, 2012b). Likewise, participation in communities of inquiry and practice is considered an indispensable strategy for sharing and disseminating knowledge and experiences on innovative pedagogical practices.

3. Method

The SINED-CLARISE for Distance Education project is based on the research-action method, where work is done on the topic of the open education movement in the distance education environment with a competency-based training approach. The project is being carried out in three main phases: a) inter-institutional diagnosis; b) human resources training; and c) implementation of open education movement research projects. Collaborative construction is fostered throughout the project, with the support of SINED distance education nodes.

This article reports on the first phase. Having conducted a diagnostic survey of the participants from the nine institutions involved in the initial project, it presents a descriptive exploratory study. The aim of the inter-institutional diagnostic survey was to identify the participants' knowledge of the open education movement, focusing on the production, dissemination and use of OERs, and the development of OEPs.

The questionnaire used in the diagnostic survey contained 30 open and closed questions exploring 4 areas: a) identification data for the participants and for OER application; b) the open education movement; c) distance education and innovation competencies; and d) networks. The sample population consisted of 42 initial project participants, who were invited to answer the survey. The total number of respondents was 40.

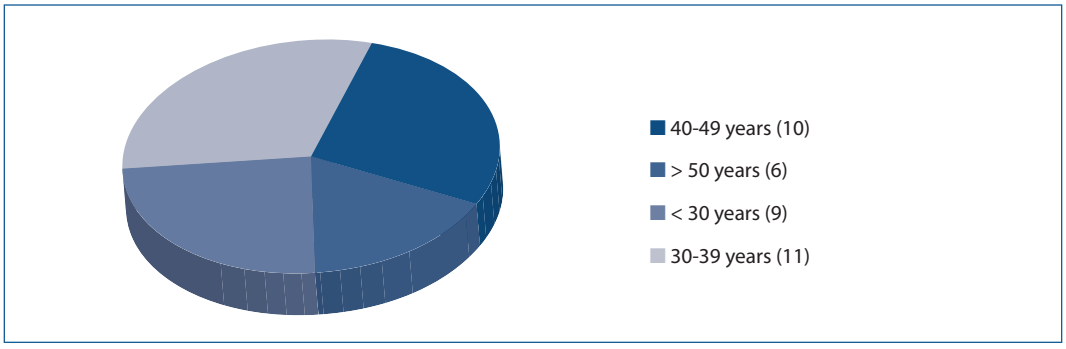
4. Results

Presented below are the results obtained for the four areas explored in the diagnostic survey.

Identification data of the participants and of OER application

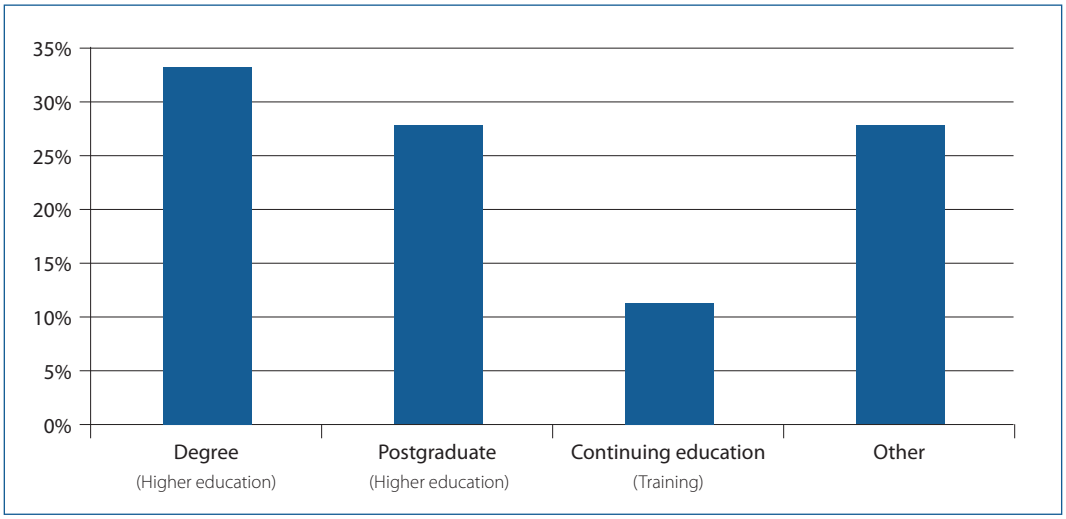
The ages of the participants in the SINED-CLARISE for Distance Education project were homogenously distributed (Figure 3) across four relatively balanced segments. In terms of academic qualifications, 14 held doctorates, 13 held master's degrees and 7 held bachelor's degrees. In terms of roles, most were research lecturers (67%), followed by administrators (22%) and students (11%).

Figure 3. Ages of the participants in the SINED-CLARISE for Distance Education project



Two-thirds of the participants belonged to public institutions, and one third to private institutions. The educational levels to which they intended to apply OERs (Figure 4) were distributed across bachelor's degrees (higher education, 33%), postgraduate studies (higher education, 28%), continuing education (training, 11%) and others (extracurricular training courses, 28%).

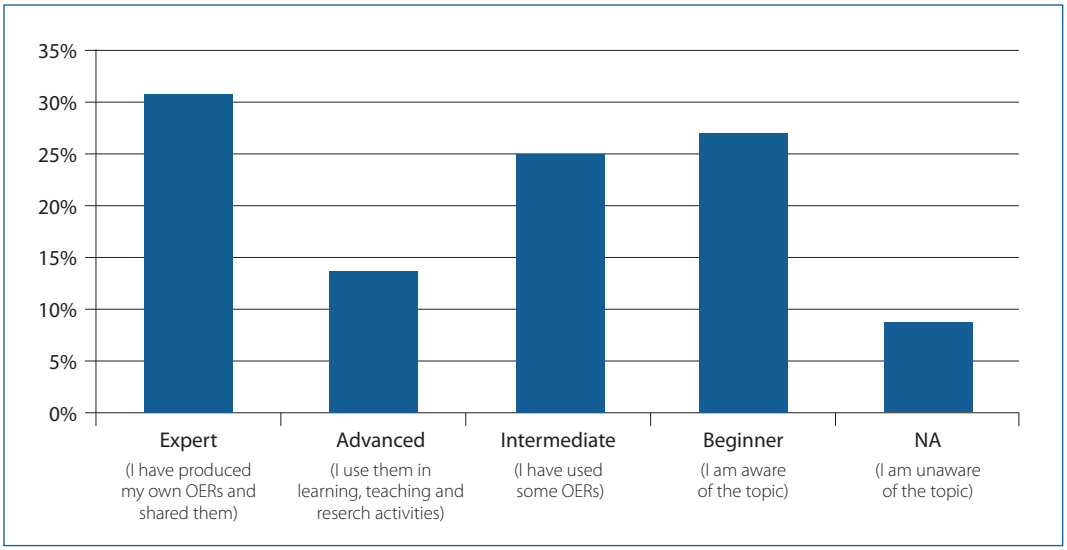
Figure 4. Education levels to which the participants intended to apply OERs



Open education movement

When the participants were asked about their level of OER expertise, the results showed that the distribution was homogenous (Figure 5) across those who considered themselves experts (31%), advanced (14%), intermediate (25%), beginners (22%) and, to a lesser extent, unaware of the topic (8%).

Figure 5. Perceived OER expertise



Some of the OEPs that the participants said that they had been involved in were OER documentation for courses, participation in CLARISE 2011 open education movement seminars, massive open online courses (MOOCs), mobile open educational resources (mOERs), repositories, nationally and internationally funded research networks and projects, as well as internships at the University of Nottingham, connected with repository harvesting and OER production and distribution, among others.

The participants' perceived barriers to or constraints on the use of OERs were mostly a lack of awareness of them, a lack of recognition for using them and a lack of policies on them (Table 1).

Table 1. Perceived barriers to or constraints on the use of OERs

There is a mistrust of resources produced by others	11	33%
There is a lack of awareness in the institution about copyright issues with regard to using and/or sharing OERs	**20**	**61%**
I do not have time to look for suitable materials	7	21%
I do not have access to the Internet	3	9%
Specialist software is required to modify the resources	7	21%
The quality of OERs is not as high as that of the resources I use	2	6%
OERs cannot be adapted to the cultural characteristics of our institution	5	15%
The language of OERs makes them difficult to use in our institution	7	21%
The use of OERs is not recognised or encouraged by my institution	**21**	**64%**
Education professionals' lack of interest in innovating	**18**	**55%**
Lack of national and regional policies to support the creation and use of OERs	**22**	**67%**
Lack of institutional policies to support the production and use of OERs	**24**	**73%**
Lack of skills and know-how to produce and use OERs	**19**	**58%**

Distance education competencies

Some participants stated that their knowledge or experience of competency-based training was intermediate (50%), while others considered themselves experts and advanced (33%), and, to a lesser extent, beginners or unaware of the topic (17%).

Innovation and networks

The participants tended to conceptualise innovation as an action that brings something new to a system or organisation (50%), and as a tangible outcome of creativity and ideas (40%). They said that they had put innovations into practice in their institutions, which is evidenced by the various projects that, nationally and internationally, have set new paradigms for educational innovation. Their plans clearly stipulate their support for innovation initiatives, as well as for programmes that promote them. They also expressed a predisposition towards innovation, specifically in relation to keeping abreast of developments in ICT use.

topic)

Figure 6. Perceived knowledge/experience of competency-based training

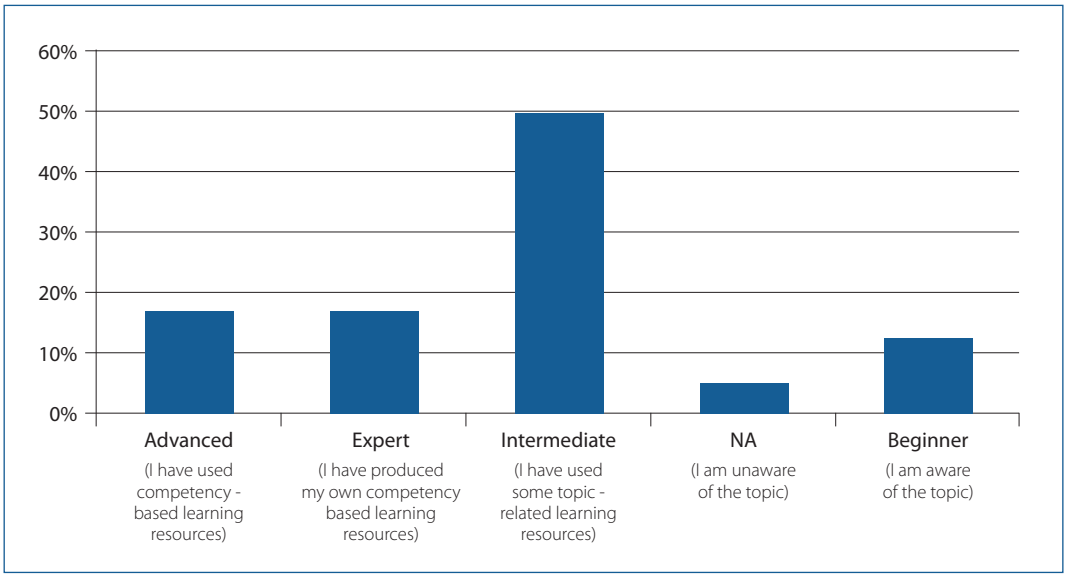


Table 2. Interest in innovation expressed in institutional strategic plans

All of the institution's members of staff are involved in producing innovation	10	25%
Innovation is generated through specialist and/or research centres	6	15%
Innovation is defined in specific strategies, goals and targets	**16**	**40%**
Innovation is not an explicit topic in the institution's operations	4	10%

Finally, the participants said that they had participated widely in several academic networks of the SINED (69%), the CUDI (53%), the National Association of Universities and Higher Education Institutions (ANUIES, 75%), the Mexican Education Research Council (COMIE, 50%), the Mexican Network of Education Research Researchers (REDMIIE, 41%) and the Network of Graduate Studies in Education (28%), among others, such as CLARISE, the Education Research and Innovation Network of North-east Mexico (REDIIEN), EDUTEC, the Network of Working Normal School Alumni, the Strengthening Information Society Research Capacity Alliance (SIRCA), the American Educational Research Association (AERA), the Mexican Network of Researchers into Mobile Learning (ReMIAM) and the Adventist Virtual Learning Network (AVLN).

5. Discussion and conclusions

Based on a diagnostic survey of the project participants and the objectives set in the SINED-CLARISE for Distance Education project, the following challenges were identified: (a) the need to generate national and institutional policies that regulate and promote open access in educational practices; (b) the importance of developing OER management systems and open knowledge communication; and (c) the promotion of a culture of academic collaboration (which is perhaps the main challenge),

where the importance of sharing is recognised and OER production and use are promoted in distance education practices.

Furthermore, the perspectives in the SINED-CLARISE for Distance Education project could be opened up by means of the following actions: (a) the training of competency-development facilitators via the seminar due to be held in the second phase of the project, called "Training of educators in the distance education environment for the development of OER-use competencies", the aim of which is to develop digital and instructional design competencies to integrate OERs in distance education environments (this seminar will take the form of a MOOC and be delivered in 2013); (b) the promotion of innovative models with open access systems, where the experience gained through the CLARISE project (as a successful case) and the project participants' level of expertise will be of great help in promoting the production, use, dissemination and mobilisation of OEPs in distance education environments; and (c) mobilisation via networks, and innovation through the formation of a network that seeks to support OEPs and re-evaluate studies and innovation in distance education environments.

Finally, it is important to conclude this article with an invitation to contribute to the generation of new knowledge on OERs and the development of OEPs in online education environments, by means of inter and intra-institutional cross-sectional studies that combine the experience gained and innovatory efforts made in a variety of national and international educational contexts.

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ARTICLE

Pedagogical models, collaborative work and interaction on online undergraduate programmes in Colombia:[1] still some way to go

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Abstract

This article presents the results of a study whose aim was to explore the experiences and perceptions that students, lecturers/tutors and coordinators had of the pedagogical models underpinning online undergraduate programmes in Colombia, and of the application of these models with regard to collaborative work and interaction. The study used qualitative and quantitative techniques to complement and contrast the participants' perceptions. A total of 48 group and individual interviews were conducted, and 288 students and 44 lecturers answered an online survey. The results show that the programmes are based on constructivist principles and tend to use active pedagogies pertaining to that theory. However, the lecturers and students expressed uncertainty about the implementation of collaborative work and the fostering of interaction.

Keywords

pedagogical model, e-learning, constructivism, collaborative work, interaction

Modelos pedagógicos, trabajo colaborativo e interacción en programas virtuales de pregrado en Colombia: Un camino por recorrer

Resumen

El presente artículo expone los resultados de una investigación cuyo propósito fue explorar las percepciones y experiencias de estudiantes, docentes/tutores y coordinadores sobre los modelos pedagógicos que sirven de sustento para los programas de pregrado en modalidad virtual en Colombia y sobre la aplicación de esos modelos en relación con el trabajo colaborativo y la interacción. El estudio empleó técnicas cualitativas y cuantitativas para complementar y contrastar las percepciones de los participantes. Se realizaron 48 entrevistas grupales e individuales y una encuesta en línea a la que respondieron 288 estudiantes y 44 profesores. Los resultados revelan que los programas se fundamentan en los principios del constructivismo y tienden a utilizar pedagogías activas propias de esa corriente. Sin embargo, docentes y estudiantes manifiestan incertidumbres sobre la puesta en marcha del trabajo colaborativo y el fomento de la interacción.

Paraules clau

modelo pedagógico, educación virtual, constructivismo, trabajo colaborativo, interacción

1. Introduction

Colombia, in the interest of favouring processes of inclusion and equality, has increased its e-learning offerings and now has 28 undergraduate programmes and 26,124 enrolled students (Ministerio de Educación Nacional, 2013). However, analysis of these programmes is in its early stages, which means that there is room to examine their pedagogical dimension and to establish advances and challenges. This article responds to the need to document how the pedagogical models on those programmes have been implemented and to explore the theoretical trends that guide them, and also to get an insight into the students' and lecturers' views of how they cope with collaborative work and interaction, given that these are key to the implementation of e-learning. Although researchers acknowledge the spread and application of massive online open courses (MOOCs) worldwide, this study is an initial approach for reflection on the design and implementation of formal online programmes offered exclusively in Colombia that lead to the award of a professional degree recognised by the National Ministry of Education.

2. The role of interaction and collaborative learning in online programmes

One of the pillars of e-learning is social constructivism, which emphasises the role of social and dialogic interaction, symbolic exchange (Araya, Alfaro & Andonegui, 2007), and debate and negotiation, which act as facilitators of knowledge construction. Consequently, there is a need to create synchronous and asynchronous spaces for students to work together on pre-established content, and also to favour collaborative work, which is understood as the type of work in which two or more individuals are involved in creating knowledge (Wessner & Pfister, 2007).

Interaction is the process of communication between the agents of the interactive triangle (materials, lecturer and student), in which confirmation and the pace of learning play a significant role (Hannafin, 1989, cited in Garrison & Anderson, 2003). Interaction generates formative instances based on computer-assisted collaborative learning (Silva & Gros, 2007), and fosters spaces in which, with proper time management, students progress in their learning processes according to their abilities and paces of learning. Coll (2004-2005) points out that, when mediated by information and communication technologies (ICTs), interactivity or interaction allows students to establish a contingent and immediate relationship between education and their own searching and processing actions. In addition, it enables an active relationship with information, strengthens their protagonism, facilitates adaptation to different paces of learning and has positive effects on their motivation and self-esteem.

A basic condition for fostering suitable interaction spaces is the existence of a balance of group and individual work activities and monitoring, which implies fostering spaces and using a reasonable amount of time to attain the learning objectives. Another is to maintain the synchrony of the groups participating in the virtual spaces and to ensure that students work together. This implies monitoring activity frequency and the number of participants per group, as well as regulating the roles, negotiation and responsibilities in group work.

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If the above-mentioned conditions are met, groups are formed that work towards knowledge construction, and thus it is possible to talk of collaborative learning. This process favours the performance of activities in which structured, deliberate interaction allows knowledge to be constructed (Thompson et al., 2009). In this type of learning, lecturers intentionally structure activities to engage students in teamwork. Karagiorgi and Symeoyu (2005) point out that collaboration is not restricted to sharing information or reaching consensus, but instead implies examining an object of study from many angles, and analysing and assessing the arguments put forward in order to perform a task.

Reasoned discussion brings considerable intervention to bear in collaborative work and knowledge construction in the e-learning mode (Barberà, 2006). In order to achieve that, it is crucial to have a developed cognitive system that manifests itself in the form of individual contributions (Näykki & Järvelä, 2008), to promote the development of collaborative skills such as collective creativity, leadership and commitment to group tasks (Thompson et al., 2009), and not to restrict it to coordination and communication among students without collaborative skills necessarily being developed among them (Kollar & Fischer, 2010).

The lecturers' role in fostering collaboration and interaction is undeniable, and it is marked by group facilitation; they are responsible for organising activities, encouraging and motivating the students, and creating a pleasant learning environment. In this respect, Salinas (2004) notes that lecturers become guides and cast off their image as absolute sources of knowledge. In general, educators act as facilitators that foster experiences for self-directed learning and knowledge construction, and are characterised by their technical and content-related skills, and by their communicative abilities (Benito, 2009).

An essential aspect of the lecturers' role is the feedback that they can provide, which may derive from their interaction with the content of materials or from communication with students. Feedback is a permanent and systematic formative act that entails identifying the students' strengths, weaknesses and shortcomings so that strategies can be designed to help them achieve the objectives set in a programme (Román, 2009).

Although feedback can be given synchronously and asynchronously, Schullo et al. (2007) suggest giving it synchronously because it allows tutors to establish student characteristics and determine their influence on knowledge appropriation, which in turn allows them to make changes in their instructional strategies to suit their students' profiles. Ham and Davey (2005) support the use of synchronous communication tools and base their suggestion on how comfortable students feel with communication of that type. Irrespective of the moment when feedback is given, the most important thing is its quality. Hence the need to examine what aspects such feedback focuses on. These may be the assessment process, activity guidelines, technology troubleshooting, content queries or personal matters.

3. Work description

This study was conducted in 2011 by two research groups belonging to the Faculty of Education and the Centre for Academic Technologies at the University of La Sabana in Colombia. A mixed methodo-

logy was employed to explore the experiences and perceptions that students, lecturers/tutors and coordinators had of the pedagogical models used in some Colombian online programmes. The study included nine higher education institutions that participated voluntarily. However, only six of them answered the online survey designed to elicit their views of aspects connected with the pedagogy and technology used in their programmes. The survey was validated by peer experts and then piloted and modified prior to being implemented online.

A total of 288 students answered the survey (56% female and 44% male). The mean age was 31.8 years with a standard deviation of 8.31 years. The ages ranged from 16 to 59 years, thus indicating a high variability within the group. Regarding the lecturers, a total of 44 (70% male and 30% female) answered the survey. The mean age was 43.16 years with a standard deviation of 10.21 years. In this group, the ages ranged from 25 to 70 years. Of the total lecturers/tutors, 56.8% stated that they worked in public insitutions and 43.2% in private centres.

In addition, 48 group and individual interviews were conducted with coordinators, lecturers and students. The interviews focused on the participants' teaching and learning experiences, and lasted for 1 hour 30 minutes each. They were transcribed and then analysed using the ATLAS.ti program. Charmaz's guidelines (2010) were followed to analyse the qualitative data, and methodological triangulation was used to give greater credibility and transparency to the analysis, as proposed by Merriam (2009)

4. Main results

One of the aims of this study was to explore the different views of the pedagogical models used in programmes and their implementation in pedagogical practice. Encapsulating the main idea of grouped patterns, several categories emerged from the qualitative analysis. This information was contrasted and complemented with data collected from the survey. Each finding is presented below.

4.1. Programmes with a constructivist aspect

The views expressed by the lecturers/tutors and coordinators in the interviews revealed an appropriation of the fundamentals of the pedagogical model used in their institutions. The tendency was to apply constructivist models, all of which placed the student at the centre of the educational act. The coordinators referred to characteristics such as knowledge construction, the lecturer's role in that process, student independence, collaborative work and the importance of timely feedback. All of these aspects form part of the principles of constructivism-based methodologies. The following excerpt[2] from an interview illustrates one of these points:

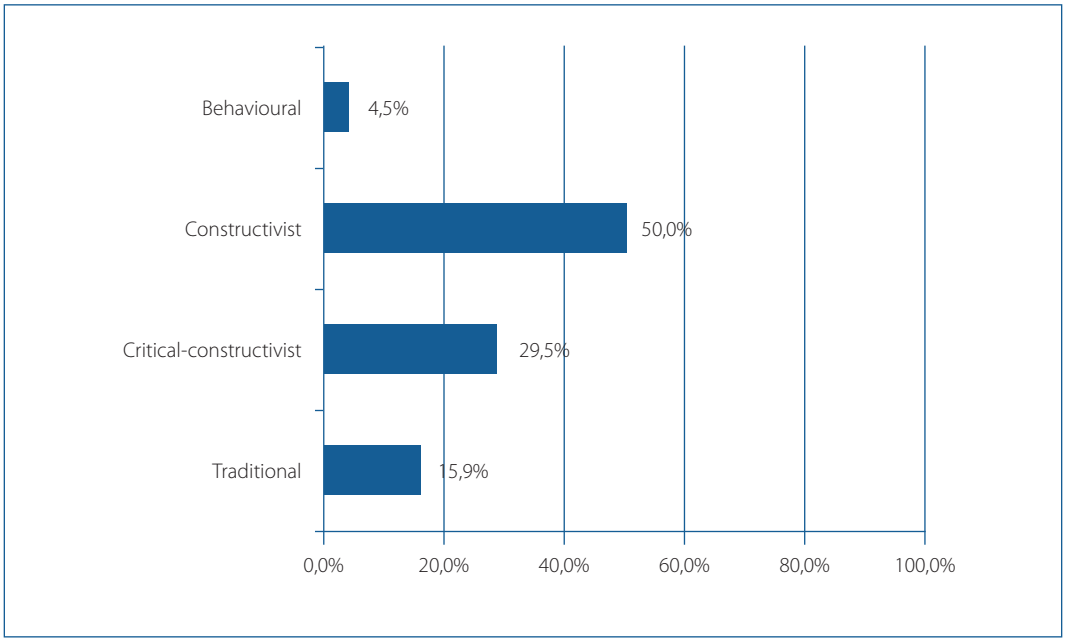
> [...] for this mode, the model seeks to ensure that the student plays a particular role as a collaborator, cooperator. Hence the theories of cooperative, collaborative learning, as a researcher, and in particular

2. All of the excerpts were originally in Spanish and have been translated into English.

as an independent [person]. That independence sometimes clashes with the students. (Coordinator, institution 2, p. 11)

The answers were consistent with the data from the surveys. Chart 1 shows that 60% of the lecturers considered that their programmes were based on constructivism, followed by those who believed that there was a critical constructivist stance (29.5%). To a lesser extent, some lecturers considered that they were based on traditional pillars (15.9%), and lastly, some believed that they were based on behaviourist theories (4.5%).

Chart 1. Pedagogical theory on which the programme is based



4.2. Constructivism: divides, uncertainties and shortcomings in its application

Some lecturers/tutors acknowledged that even though certain institutions had pedagogical models, such models became ambiguous, were unsatisfactory for guiding lecturers in their pedagogical tasks, and were conceived as ideal or utopian. The ambiguity in the use of terms appeared to stem from conceptual shortcomings and a lack of awareness of models and of the strategies and tools to implement those models. The feeling that these lecturers had coincided with the assertion made by Prendes and Castañeda (2010), who highlighted the role of reflection on lecturers' institutional and pedagogical needs, mainly in relation to their ICT competencies for pedagogical purposes. The following excerpt from an interview illustrates this section::

The pedagogical model […] is not consistent enough to provide pedagogical tools or guidelines for lecturers to implement. The model is too utopian […]. As such, the pedagogical model simply gives a

> description of the theories; it does not tell lecturers how to adopt it as one of the tools that they can use as part of their pedagogical strategies. (Lecturer, institution 2, interview p. 2)

Likewise, lecturers from other institutions emphasised the inconsistencies between the social-constructivist nature of the model and its application. One of the most important assumptions of social constructivism is that individuals have the potential to produce knowledge by interacting with their peers. However, according to the lecturers, there was still a tendency to favour individual construction, which did not bear any relationship to the intention of pedagogical models that place emphasis on collaborative group work and interaction-based knowledge construction.

> This is where I believe that the pedagogical model is one thing and the reality is another. In fact, the accompaniment that lecturers provide is personalised because groups are coming; but you realise that the shortcomings in the groups are individual. After identifying individual shortcomings, lecturers must provide personalised accompaniment. So there is no social constructivism, because what the group actually does is share the setting, yet the cognitive process is clearly individual. (Lecturer, institution 4, p. 10)

The data from the interviews were consistent with those collected from the survey. The lecturers and students were asked about learning activities. A high percentage of the students (55%) and lecturers (50%) said that the programmes promoted individual activities. Of particular note is that 9% of the educators said that they never carried out group activities (Table 1).

Table 1. Frequency of activities carried out on the courses

		Always	*Often*	*Sometimes*	*Hardly ever*	*Never*	*Total*
Individual activities	Students	55%	29%	11%	4%	1%	100%
	Lecturers	50%	36%	11%	3%	0%	100%
Group activities	Students	20%	22%	26%	18%	14%	100%
	Lecturers	34%	32%	20%	5%	9%	100%

It was found that while the online programmes were based on constructivist models, their application in practice created uncertainty because there was still a tendency to favour individual activities; although these are necessary, they are not enough to generate knowledge. As pointed out by Powell and Kalina (2009), there should be a balance between constructivist strategies, pedagogical practices and student-lecturer communication to produce an effective lesson.

4.3. Is it possible to talk of favourable conditions for collaborative work and interaction?

One of the pillars of social constructivism is interaction, which depends on the type of structuring that tutors propose. In the first instance, the questionnaire asked about the frequency with which

roles were assigned for group tasks to be carried out. Table 2 shows that 43.2% of the lecturers said that they always or often assigned roles, whereas 18% said they never assigned any. In contrast, the students said that they were hardly ever (21.8%) or never (27.8%) given any instructions to play roles, which may have impacted on the interaction dynamics and on carrying out group work.

Table 2. Inclusion of instructions for students to assume roles to carry out group activities

	Always	*Often*	*Sometimes*	*Hardly ever*	*Never*	*Total*
Lecturers	9 (20,5%)	10 (22,7%)	10 (22,7%)	7 (15,9%)	8 (18,2%)	44 (100%)
Students	44 (15,3%)	51 (17,7%)	50 (17,4%)	63 (21,8%)	80 (27,8%)	288 (100%)

In the interviews, interaction management was studied in greater depth, and the students were asked about the strategies used. It was found that group work was infrequent, and that when it was proposed, the lack of guidelines for effective interaction led to dissatisfaction among the students:

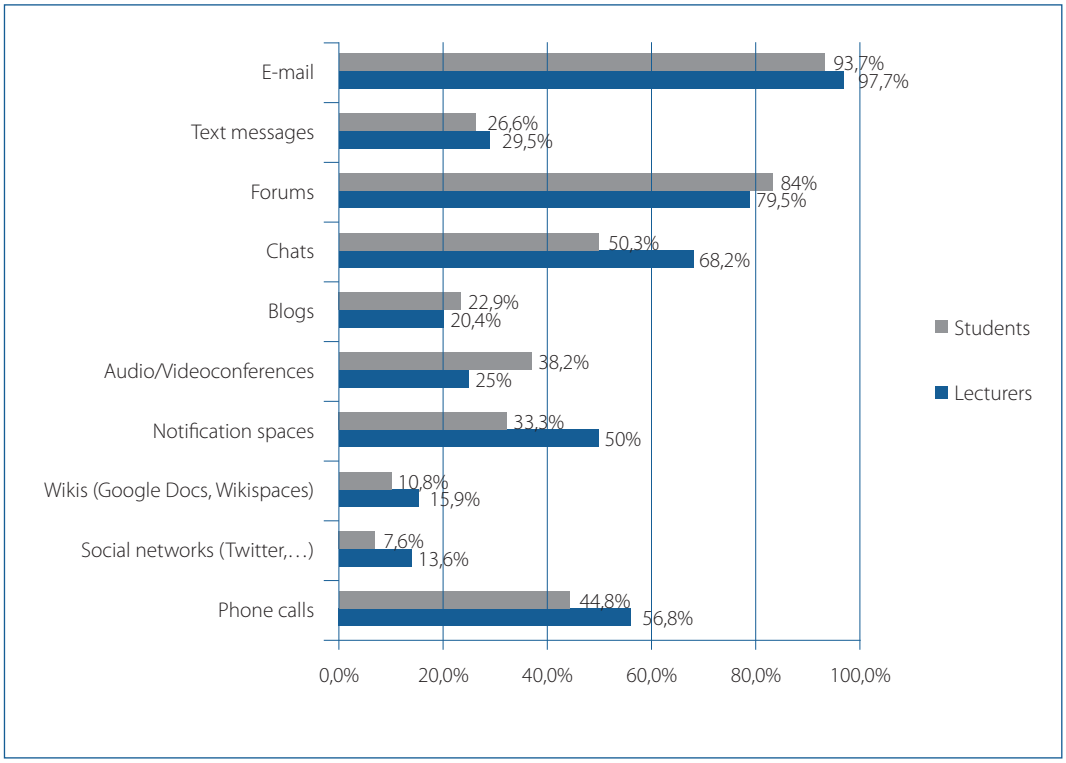
> Some fellow students don't know how to answer and have a different way of thinking, so that's where we noticed a gap, a shortcoming in that part. There aren't enough channels for interaction between lecturers and students. (Student, institution 1, interview p. 2)

Another aspect that emerged from the interviews was that even though the tutors offered their students feedback, and stressed the importance of it because it allowed them to identify aspects that needed improvement, no evidence of any synchronous communication among students being encouraged was found. This finding is important because it brings to light a shortcoming in the structuring of peer interaction and feedback, which, as mentioned by Falloon (2011), serves as a support for clarifying doubts about topics covered on a course.

In the study, the lecturers and students were also asked about their use of tools to encourage communication. Chart 2 shows that e-mail was used by nearly all the lecturers (97.7%), followed by forums (79.5%) and chats (68.2%). The least used were Twitter, Facebook and Hi5 (13.6%) and wikis (15.9%). These trends were also found in the students' answers, who said that e-mail (93.7%) and forums (84%) were the tools they used most, while social networks (7.6%) were the ones they used least. It is important to note that despite having a variety of tools at their disposal, phone calls strongly prevailed as a means of encouraging communication.

From the results shown in Chart 2, it is possible to infer that there were shortcomings regarding the lecturers' familiarity with the use of certain Web 2.0 tools. This was also apparent in the interviews. For example, the lecturers made no reference to the use of social networks or tools such as wikis or blogs. For their part, the students were resolute in pointing out the lack of an "*online educator profile*":

Chart 2. Communication tools used on the courses

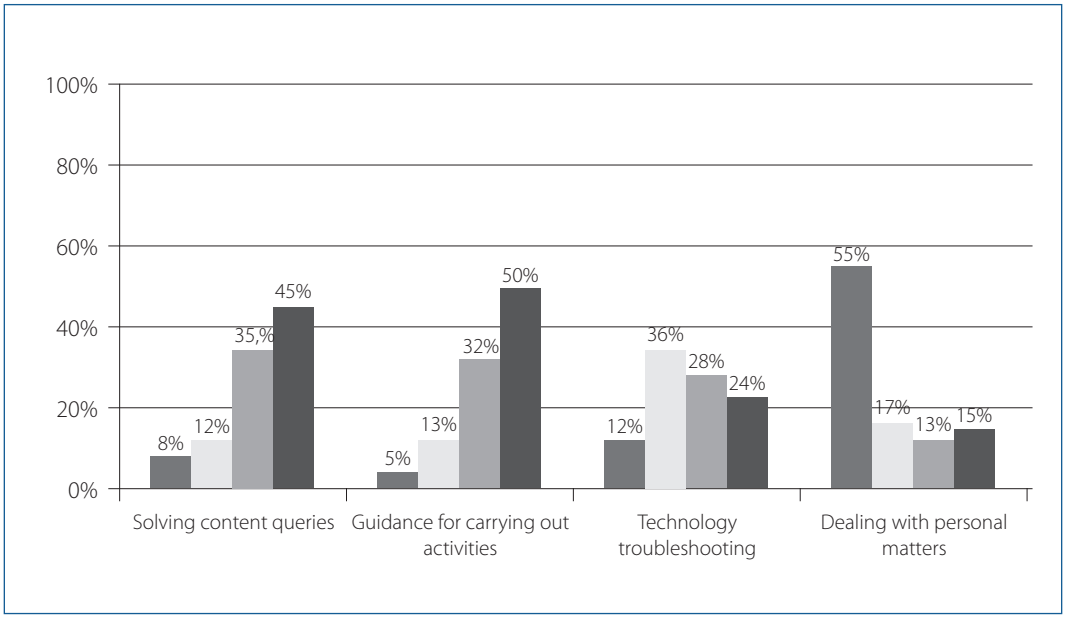


It is important to point out that variety in the pedagogical use of certain tools was not found; the lecturers and students both said that efforts were made to foster reasoned discussion in the forums, as was the capacity to encourage further exploration of certain topics. But even in these spaces, the work was understood as a distribution of tasks and searching for and presenting information, which was generally left up to a single member of the group:

> … we do group work on a topic. […] so each of us researches the part that we are responsible for, depending on the topic. At the end, what I do is bring it all together. (Student, institution 1, p. 3)

Finally, students were asked about communication with the lecturers. Most of them pointed out that their interactions with the lecturers revolved around guidance for carrying out activities (50%), followed by solving queries about course content (45%). To a lesser extent, communication focused on technology troubleshooting and on dealing with personal matters (16%).

Chart 3. Aspects on which communication with the lecturers focused



*On the scale, 4 = often, and 1 = not often.

5. Conclusions and discussion

The online undergraduate education programmes explored in this project were based on constructivist principles and acknowledged that students were the active agents of their learning processes. The language used by the lecturers hinted at a familiarity with characteristics such as independence, collaborative work, interaction and accompaniment. However, there was a lack of appropriation of the theoretical frameworks in which the academic proposals were grounded, which led to shortcomings and uncertainties in the staging of programmes, and generated ambiguity with regard to carrying out collaborative work and to fostering interaction.

The analysis of the data collected by means of surveys and interviews revealed that collaborative work was a field in need of development. It was understood in a very limited sense, being associated mainly with the formation of work groups and the distribution of tasks, in which each student individually searched for information and shared it with fellow students. Collaborative skills, which Kollar and Fischer (2010) regard as positive interdependence and group process, were not necessarily generated.

A grasp of collaborative work concepts could encourage the generation of suitable and intentional learning activities among peers in such a way that they would engage in group work to attain the proposed learning objectives. According to Barkley, Cross and Howell (2007), this implies meeting three key conditions: (1) an intentional structure; in other words, learning activities with clear aspirations, (2) a grasp of what collaboration means; in other words, an equitable and participatory commitment to what is being done, and (3) teaching that targets the attainment of set learning objectives. If these conditions are met, collaborative work will have a positive influence on

group regulation processes, as well as on their cohesion and satisfaction (Dewiyanti, Brand-Gruwel, Jochemsa & Broers, 2007).

Another priority is that collaboration should get students actively involved in critically examining the object of study (Karagiorgi & Symeou, 2005). This aspect has serious implications if it is considered that, irrespective of the mode, education ought to prepare students for professional life by means of teamwork; a requirement for the attainment of group objectives in a variety of social spheres.

Encouraging people to work with others requires a critical examination of the methodological alternatives and of the strategies that are promoted within the programmes. Forums, chats and other interaction spaces should be scrutinised in order to examine the types of discussion proposed, the content of those discussions, ways of working together, and the distribution of roles and responsibilities. Several studies have pointed out that interaction frequency in distance education is a way of analysing participation and academic achievement, while avoiding aspects such as participation quality (Yang, 2012). In turn, that quality is not limited solely to students, as it involves lecturers too. In this respect, Barberà (2006), and Näykki and Järvelä (2008) point out that the forms of interaction promoted by programmes influence the fostering of reasoned discussion for knowledge construction.

E-learning in higher education institutions in Colombia undeniably requires a more categorical use of the potential that Web 2.0 tools offer. Characteristics such as their dynamics, interactivity, volatility and adaptability, among others (Brown, 2012), offer infinite possibilities to cognitively and creatively stimulate Colombian students, promote individual reflective processes and foster interaction and collaborative learning (Laru, Näykki & Järvelä, 2012; Kesim & Agaoglu, 2007).

On the other hand, the use of forums should continue to be encouraged because they are a fundamental component of collaborative work in Colombian e-learning. Ensuring that students remain engaged in online discussion is crucial because it encourages collaborative learning, increases constructive dialogue and provides opportunities for sharing. Unlike face-to-face classes, where gestures and visual and/or verbal signs can give instructors an idea of their students' motivation and level of interest, in e-learning mode it is not easy to assess the participants' level of motivation and engagement, so this must be taken into account.

However, it is essential not to overlook a number of fundamental aspects such as the idea that, irrespective of the tool or activity used, lecturers must have an educational background that puts the attainment of objectives first. The reflective capacities of designers, of topic experts and, above all, of lecturers must prevail in order to decide on the applicability and utility of those tools and activities. Likewise, it is essential to ensure that educational agents do not allow themselves to be 'seduced' by novelty, but instead give priority to accompaniment and scaffolding in the learning process (Azevedo & Jacobson, 2008).

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ARTICLE

Cooperation for institutional strengthening: shared knowledge in the quest for improved teaching

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Abstract

This article presents an evaluation of the institutional cooperation project entitled "*Universidad y sociedad del conocimiento. Fortalecimiento institucional en áreas dedicadas a la enseñanza universitaria con nuevas tecnologías*" (FEUNT, Universities and knowledge society. Institutional strengthening in areas dedicated to new technology-mediated university teaching), funded by the Spanish Agency for International Development Cooperation (AECID) and undertaken by the University of Santiago de Compostela (USC), Spain, and the National University of Córdoba (UNC), Argentina. The main aim of the four-year project was to incorporate technologies into the institution, with emphasis on improved teaching and institutional conditions. By combining top-down, bottom-up and middle-out strategies (Cummings et al., 2005), the project articulated five programmes (research, lecturer training, technological improvement, teaching materials production, and dissemination and open knowledge), in which lecturer training, educational technology research and technology investment were interrelated. Taking needs into account, investment was made in core technologies and peripheral learning technologies (Salmon, 2005) that allowed the activities to be carried out, while others showing new potential were proposed. The aim of the work was to mobilise institutional culture in order to bring changes in teaching practices (Hargreaves, 2003). Lecturer training was carried out by means of workshops focusing on teaching materials production, viewed as an artefact that enabled teaching staff to reflect on decision-making when confronted with technology-mediated teaching processes (Cochran-Smith & Lytle, 2001). The results of the evaluation evidenced the success of a proposal based on strengthening a working group (Educational Technology Area) to support teaching staff. They also highlighted several weaknesses, particularly in relation to the project's sustainability.

Keywords

international cooperation, institutional strengthening, technology-mediated university teaching

Cooperación para el fortalecimiento: conocimiento compartido en la búsqueda de la mejora de la enseñanza

Resumen

Se presenta la evaluación del proyecto de cooperación institucional «Universidad y sociedad del conocimiento. Fortalecimiento institucional en áreas dedicadas a la enseñanza universitaria con nuevas tecnologías» (FEUNT), financiado por la Agencia Española de Cooperación Internacional para el Desarrollo (AECID) y desarrollado entre la Universidad de Santiago de Compostela (España) y la Universidad Nacional de Córdoba (Argentina). El proyecto, de cuatro años de duración, ha tenido como objetivo principal la inclusión de tecnologías en la institución poniendo el acento en la mejora de la enseñanza y en sus condiciones institucionales. A través de una combinación de estrategias top-down, bottom-up y middle-out (Cummings et al., 2005), el proyecto ha articulado cinco programas (investigación, formación del profesorado, mejora tecnológica, producción de materiales para la docencia y difusión y conocimiento abierto) que interrelacionaron la formación del profesorado con la investigación en el campo de la tecnología educativa y la inversión tecnológica. Teniendo en cuenta las necesidades, se invirtió en tecnologías centrales y periféricas (Salmon, 2005) que permitieron el desarrollo de las actividades y se propusieron otras que mostraron el horizonte de nuevas posibilidades. El trabajo desarrollado pretendió movilizar la cultura institucional con el objeto de generar cambios en las prácticas de enseñanza (Hargreaves, 2003). La formación de profesores se ha desarrollado a través de talleres que han tenido como foco la producción de materiales para la enseñanza como un artefacto que posibilitó al profesorado participante la reflexión sobre la toma de decisiones al encarar los procesos de enseñanza mediados con tecnología (Cochran-Smith y Lytle, 2001). Los resultados de la evaluación muestran el éxito de una propuesta basada en el fortalecimiento de

un grupo de trabajo (Área de Tecnología Educativa) que apoya al profesorado. También muestra algunas debilidades sobre todo atendiendo a la sostenibilidad del proyecto.

Palabras clave
cooperación internacional, fortalecimiento institucional, enseñanza universitaria con tecnologías

1. Introduction

The incorporation of information and communication technologies (ICT) into higher education institutions has emerged as an imperative part of the radical transformations that are taking place in the way that academic knowledge is produced and distributed in today's society. In an economic and social context that brings state education institutions into question, ICTare yet another catalyst that casts doubt on every dimension and function of universities as a whole. So much so that they have become a further source of inequality. Hence the importance of knowing how they really affect research, teaching and extension, and what consequences a lack of them in certain places and at certain times will have (De Sousa, 2012).

In recent decades, the integration of these technologies has formed part of the political agenda of most higher education institutions around the world (Hanna, 2003; GUNI, 2008). Latin America is facing a particular challenge in the sense that it once again has to overcome another symptom of the region, which on this occasion is the digital divide (Selwyn, 2010).

University scholars all over the world, and especially in the Ibero-American sphere, have alluded to the lack of training in methodologies and tools that could provide the necessary resources to cope with new challenges. This has led to a limited perception of the digital inclusion concept, where the digital divide is understood as a whole (Gewerc, 2007a) without analysing the different (strategic and operational) dimensions of it.

This is the framework within which there is ongoing discussion about why new technologies should be incorporated into educational proposals or what transformational potential these technologies really have in terms of achieving teaching practices that meet the demands of today's society. It was in this context that the project funded by the Spanish Agency for International Development Cooperation (AECID) entitled "*Universidad y sociedad del conocimiento. Fortalecimiento institucional en áreas dedicadas a la enseñanza universitaria con nuevas tecnologías*" (FEUNT, Universities and knowledge society. Institutional strengthening in areas dedicated to new technology-mediated university teaching) was carried out in the Faculty of Philosophy and Humanities (FPH) at the National University of Córdoba (UNC), Argentina, and coordinated by the University of Santiago de Compostela (USC), Spain.

The design and implementation of this project was a product of the joint and sustained work done by both universities within the Unisic Network,[1] where, since 2006, five Ibero-American universities,

1. http://unisic.usc.es

supported by the AECID, have conducted research, held debates and seminars, and put forward proposals to enable a grounded diagnosis to be performed and specific guidelines to be produced for the UNC's institutional strengthening with regard to new technology incorporation.

The project carried out at the UNC combined top-down, bottom-up and middle-out strategies (Cummings et al., 2005). It consisted of five interrelated programmes, and the work contained in it was based on linking lecturer training with research. Taking the UNC's new technology incorporation needs into account, and with the AECID's financial support, investment was made in core technologies and peripheral learning technologies (Salmon, 2005) in order to carry out the proposed activities, to attain the objectives set and to identify alternatives for developing new potential. The aim of the work was to mobilise institutional culture in order to bring changes in teaching practices (Hargreaves, 2003). Lecturer training was carried out by means of workshops focusing on teaching materials production, seen as an artefact that would enable teaching staff to reflect on teaching (Cochran-Smith & Lytle, 2001).

From the outset, FEUNT had an open knowledge approach and opted for open source software for every application. As a result, the importance of copyright issues in all of its actions became manifest.

The evaluation proposal was put forward with the basic aim of assessing the overall impact of the project on the institution as a whole. The views held by those involved were considered crucial to this process, which also took account of guidelines and criteria regarded as useful when a) projecting institutional strengthening by means of teaching technologies to the rest of the UNC and b) transferring it to other universities.

2. The cooperation project

The work done within the framework of the FEUNT project opted for cooperation as the relationship and working principle for the mutual growth of people, institutions and knowledge. As a context for dialogue, it allowed collaborative relationships to be developed; resources to be pooled; activities beneficial to the participants to be carried out; ties to be expanded and tightened; a feeling of belonging to be created; knowledge, experiences and know-how to be shared; and relationships of exchange and reciprocity to be established.

The studies conducted at the UNC within the Unisic Network in 2007 and 2008 (Gewerc, 2009) showed that the technology incorporation processes were in their very early stages, with varying degrees of development, and were characterised by the juxtaposition of efforts made by lecturers and academic units that were isolated from each other. On top of that, technology incorporation did not always go hand in hand with processes of reflection on pedagogical practices that would allow changes to be made. The UNC in general and the FPH in particular did not have the basic infrastructure for ICT-mediated activities. The FPH-UNC, with approximately 6,000 enrolled students, had a computer room with 10 computers. However, the classrooms did not have any connection facilities or video projectors, and the lecturers did not have any dedicated areas for producing their digital materials or

dealing with online queries. This exacerbated the differences between the people that had access to those resources outside the institution and those that did not. There were very few academics working on these issues and even fewer that had postgraduate training to enable them to set up a research and development (R&D) area. Training courses connected with this topic were very limited and did not focus on the relationship between universities, the knowledge society and teaching. Instead, they focused solely on the technical aspects of technology incorporation. Moreover, the lecturer training courses available on the topic were unsatisfactory. Under these circumstances, it was impossible to provide any permanent accompaniment that would foster the continuity of technology-mediated proposals or allow the strengths and weaknesses to be systematised (Gewerc, 2009).

By analysing this reality, it was possible to produce a project for improvement, with the institutional strengthening idea as an objective that would articulate the development of the historic principles of state universities: education, research and extension;[2] with the challenges of the 21st century: ICT integration, international relations and network formation. And all of this within the particular macro-context of Latin American universities that, with very little funding, aspire to provide greater access and democratisation on the one hand, and high academic quality on the other (Edelstein et al., 2009).

The four-year project, with annual phases, focused on the FPH-UNC's Educational Technology Area (ATE, to use the Spanish acronym). The aim of doing so was to strengthen it by creating actions and programmes that could make full use of its potential and lead to results that would be beneficial to all the lecturers. This challenge informed the proposal and guided it in many clearly articulated directions, where technologies were not only seen as the tools required to provide access to cultural assets available on the network, but also as objects of reflection, study, research, knowledge production and critical analysis, all of which are inherent to scholarly activity at university level.

Five programmes were proposed for the FPH, with projection to the UNC as a whole. These programmes were: 1) Training programme, 2) Teaching materials production programme, 3) R&D programme, 4) Technological improvement programme, and 5) Dissemination, communication and promotion of open knowledge policies programme.

Each of them contributed to the overall objective – the institutional strengthening of an area in order to improve university teaching through new media and technologies – while at the same endeavouring to lay the foundations for an articulated institutional growth and consolidation system that would be sensitive and adaptable to the transformations required in the process.

3. Strategies and perspectives. Changes in university institutions

Tackling an improvement project from the proposed perspective meant that a number of challenges had to be dealt with. The first was to make the most of lessons learned from previous experiences

2. The 1918 Argentinean University Reform incorporated extension as one of the functions that would bring universities closer to society, and advocated that they should become centres of excellence for the scientific study of major national issues.

in other parts of the world. Despite the imperative need to have a better endowed technology infrastructure than the one in existence at the start of the project, one of those lessons was undoubtedly to consider that the infrastructure had to be relevant and suited to the real needs of the users, otherwise it would quickly fall into disuse.[3] Another challenge was the need to bring about changes in institutional cultures, regarding the ways in which teaching in the institution was usually performed. From the outset, this implied the need for a longer term project because the concern was to ensure that solid foundations would be laid for continued development after AECID funding had come to an end.

Numerous studies have reported on the complexity of changes in teaching and in the organisation, making it clear that they depend on the teaching staff's beliefs, the teaching and learning theories that the teaching staff support, training, educational policies and organisational culture, among others (Hargreaves, 2003; Law, Pelgrum & Plomp, 2008; Mumtaz, 2000; Somekh, 2008). On the other hand, the studies conducted by Larry Cuban more than a decade ago showed that "in order for fundamental changes to occur in teaching and learning, we must have an overall reform in the organizational, political, social and technological contexts of schools" (2001). Tony Bates (2001) also considered this to be the case. However, our studies (Gewerc, 2009; 2010) and several others conducted elsewhere (Shoham & Perry, 2009; Czerniewicz & Brown, 2009) showed that the acquisition of IT equipment was the area in which the greatest efforts had been made, whereas aspects such as lecturer training had been overlooked (Duart, Gil, Pujol & Castaño, 2008).

In addition, studies on policies relating to technology integration in institutions have shown that their success is determined to a large extent by the actors implementing them, and by the mediation opportunities between the regulator and the regulated actors (Duart & Lupiáñez, 2005). The mediated agent within the institution then becomes an important component, and acts between the technological imperative (which could be represented by top-down policies) and social constructivism (bottom-up). This frame reveals a third option, the middle-out one, which is led by middle managers. In their national study about the adoption of technologies in 28 Australian universities, McNaught et al. (2000) found that the three approaches were not necessarily mutually exclusive. While their characteristics are very different, they operate in institutional environments that are also different.

In order to integrate a middle-out approach, the ATE was selected. It was an institutionalised group that had the required characteristics to perform that mediation (proximity to the teaching staff and their ways of thinking and needs, as well as direct contact with the FPH-UNC's academic authorities). By strengthening it, it was felt that it would be able influence both levels of the organisation.

The above-mentioned study conducted by McNaught et al. (2000) summarised and articulated the interrelated factors that help to define successful proposals around three themes: policy, culture and support. Policy could be identified as the top-down approach, which includes the degree of leadership, the existence of specific institutional policies, strategic processes, etc. Culture could be represented by the bottom-up approach, which includes factors such as teaching and learning

3. Numerous studies have reported that the technological endowment of education institutions quickly falls into disuse, since it responds to a technological imperative rather than the need felt by the institution's actors (Montero, 2007; Gewerc, 2007b).

models, attitudes towards innovation, etc. The third component, support, includes the institutional infrastructure dedicated to supporting and facilitating change, such as the library, IT services, staff professional development, student support, etc. McNaught et al. (2000) represented the three themes in a Venn diagram, and acknowledged that when a change took place, there was an overlap between and within the three themes: policy, culture and support. By evaluating the impact of the project, we shall see how these three themes developed.

4. Project evaluation: learning from the process and from the results

The evaluation was carried out in the third and fourth years of the project. It was considered to be "a type of disciplined inquiry undertaken to determine the value (merit and/or worth) of some entity – the evaluand – such as a treatment, program, facility, performance, and the like – in order to improve or refine the evaluand (formative evaluation) or to assess its impact (summative evaluation)" (Lincoln & Guba, 1986).

In this context, the evaluation focused on analysing the process and the impact of the project's implementation in the FPH-UNC from an interpretative, qualitative perspective. Those involved in and committed to the project could therefore be included for the purposes of analysing and interpreting relevant information from their discourse, that is to say, their declarative knowledge. It was undertaken in two stages. The first, in the third year of the project, focused on the materials production workshop; and the second, between the third and fourth years, put emphasis on the process and impact of the project as a whole, in order to establish what had been attained or, in other words, what social, cultural and technical changes, effects and consequences it had produced in the institution and in people from the education community. In order to perform the evaluation, three types of instrument were used to complement methodologies and obtain richer data: questionnaires, interviews and a focus group. Presented in this article are the results obtained from the second stage, referring to the impact of the project on the institution as a whole.

4.1. Questionnaires, interviews and the focus group

An anonymous, self-administered questionnaire was implemented online. A randomly selected sample consisting of 211 FPH-UNC lecturers (from a total population of 467) was asked to complete it. The sampling error was 5% and the confidence interval was 95%. In total, 70 responses were received, which represented a 33.18% response rate. The questionnaire contained 41 items divided into five sections. These sections were: identification; FPH-UNC content management system (CMS); participation in training activities carried out by the ATE; equipment endowment; and institutional support. The data from the questionnaire were exported to SPSS 18 (PASW Statistics).

In total, 14 in-depth interviews were also conducted; 5 with lecturers participating in the materials workshop and 9 with key informants (because of their roles in carrying out the project). They were

very useful for getting an in-depth insight into the views held by those involved, which allowed their intentionalities and the meanings they invested in the action to be captured.

In the interviews, the informants were asked about general aspects of the project, their participation and engagement in it, their perceptions of its strengths and weaknesses, and its impact on the institution. The data from the interviews were processed by means of content analysis (Glaser, 2002).

The focus group technique was used to complement and triangulate the data collected from the other instruments. A focus group was held with 9 university school directors of the FPH-UNC's various schools. The script included questions relating to their perceptions of the impact of the project on the institution, their assessment of the ATE's services, the project's strengths and weaknesses, and its continuity.

5. Results

The results obtained from the analysis of the impact of the FEUNT project on the FPH-UNC are presented below, under each of the three previously mentioned themes.

5.1. Policy

In the 1990s, Argentina began to respond to the international agenda for higher education through Act 24.521, which – still in force – takes a neoliberal approach to three issues: decentralisation, reducing the national government's role, and opening up to privatisation. However, it does not make any specific mention of ICT as an element important to the transformation of universities. The fact that there is very little regulation on this issue means that an in-depth reflection is perhaps even more crucial, and it should deal with the transformations that these technologies may engender for universities, as well as the consequences of their absence, along the lines suggested by De Sousa (2012). In this respect, according to the data obtained from the focus group, the project participants as a whole valued the role that the project played because it generated a framework for reflection and joint work. It was seen as a strength that enabled a broadening of the view of university problems; learning about other realities, contexts and experiences would lead to a better understanding of one's own context.

On the other hand, the FPH-UNC's institutional policy was an ideal setting within which to carry out the project. The faculty's governing body, which oversaw it, was committed to the ideals of state universities and the democratic function of knowledge and, in that respect, to the project. A university school director stated that the project was quite interesting because it was being carried out in an institution of which the ATE team members formed part, and as such they were committed to a series of issues that led them to design the project specifically for that faculty. He went on to say that the political will of the group behind the project was to strengthen the faculty by means of these absolutely innovative aspects.

However, two factors complicate the picture. First, the FPH is one of the UNC's most complex faculties, as it offers 28 bachelor's degree courses across 9 schools. Second, since the 1990s, Argentina' higher education policy has promoted research to the detriment of teaching. These issues were taken into account when developing the project programme management strategy. The organisational complexity of an institution like the FPH-UNC created difficulties with regard to the dissemination of the project and the potential that it had for the university as a whole. In order to improve that aspect, emphasis was placed on internal dissemination policies and, in the fourth year of the project, advances were made in this respect. Despite that, some lecturers stated that they had not taken part in the training activities owing to a lack of information. On the other hand, the need for teaching staff accreditations based more on research than on teaching has created a barrier to participation in longer term training activities. Proposals for setting up a postgraduate area dedicated to university teaching have not become as institutionally embedded as had been hoped.

The project also encouraged the institution and the governing team to get involved in taking decisions on very important legal aspects, such as defining the use of open access software for all IT applications, both managerial and academic. In relation to discussing the issue of licences and copyright, members of the UNC's academic authority said that one of the greatest difficulties connected with it was not so much the type of solution that ought to be proposed, but rather the problem it represented for the academic community.

The financial support granted by the AECID represented a significant boost for achieving all of these actions and, while it cannot be said that this was the most significant aspect of the project, it cannot be overlooked because it acted as a driver, enabling the actions and the staff that had to carry them out to be specified.

Some difficulties were also found, particularly in relation to coordinating the turnaround times of the four institutions involved (AECID, USC, UNC and FPH). The local project coordinator said that she felt that the administrative aspect was quite complicated because the institutions worked in accordance with four different sets of timings, priorities, ways of doing things, formal deadlines, etc.

The project's sustainability was of great concern, especially with regard to the human and material resources allocated to it. While the funding granted by the AECID enabled the project to be set up and developed, the big question was how the actions carried out could be made sustainable and how it would be possible to carry on without that financial support. Evidence of this was found in the interviews with the key people in the project management team, who said that it would be necessary to see what other funding channels could be found, and to design practices that did not entail high human resource costs to carry them out. This concern was also noted among the university school directors, who asked how it would be possible to make what had been done in the project – the actions already carried out – sustainable. They felt that this was a major constraint.

5.2. Support

The proposal for strengthening teaching in the FPH was based on the presence of the ATE group as the driver of change and as a key, strategic place. It was formed by a media specialist, a pedagogue and two film specialists. It was recognised as an important, accessible area that had institutional

support. The project's development allowed it to be enduring, strengthened and legitimated within the faculty. The fact that this team opted for interdisciplinary organisation was also valued. Evidence of this was found in the interviews with the lecturers, one of whom said that working with other areas of the university was very positive because work in the area was also done in a cross-disciplinary manner. That lecturer also felt that the ability to work in teams was necessary. The focus group also highlighted the importance and strengthening of the ATE team, which not only served as an unconditional support as an important area backed by the institution, but also generated trust because it was possible to see that others were doing something important. Similarly, evidence of the importance of this group to the key people in the project management team was also found, who considered that the area had become a place of reference.

Teaching staff professional training and development was a key factor on which efforts were focused to attain the overall objective of institutional strengthening. The analysis of the interviews and the focus group showed the powerful effect that the project had had on how to use and how to work with digital technologies in the university. The university school directors in the focus group said that the project had had a very powerful and significant effect on the lecturers because they had been able to begin to think with technologies in mind, rather than considering them as add-ons within the teaching proposal. The teaching staff interviewed also expressed similar feelings, saying that people were often afraid of new technologies and believed that they would be unable to cope with them or do things properly but, with the backing and support of a team of people who did know, they were able to see things differently.

The data obtained from the questionnaire reinforced the evidence found in the interviews and the focus group. Of the questionnaire respondents, 46.4% stated that they had undertaken technology training in the previous three-year period. Of that percentage, 78.6% stated that they had been trained in the ATE, and pointed out that the training received had enabled them to improve their teaching processes, mainly with regard to classroom dynamics.

Of the lecturers surveyed, 44.3% stated that they had taken part in some ATE training activity, and highlighted the lecturer training course on how to use Moodle, the materials production workshop and the training course on open access software applications. These activities were rated as excellent or very good. In addition, the ATE's position as a place of reference for lecturer technology training was demonstrated by the requests from lecturers who had not taken part in the proposed activities, as nearly all of them asked for more scheduling options for training, with greater support and advice from the ATE.

5.3. Culture

The analysis showed that the project had a major impact on teaching practices, as the intention to make changes, however small, was expressed. This meant that integrating technologies into teaching proposals would become a 'natural' part of the process. In this respect, the university school directors said that nobody was thinking about whether they would or would not be used, or whether they would go to this or that resource. Rather, they were thinking with that resource in mind, and

considered that nowadays people were familiar with technologies and its different languages, and that they would be incorporated into teaching as a matter of course.

As a result of the training carried out by ATE within the framework of the project, the use of the CMS in teaching materials had become generalised; it was used by 92.9% of the teaching staff surveyed.

The tools mainly used were those that increased communication with the students (86.4%), informed administrative issues (90.9%) and facilitated access to the faculty's materials (90.9%). We found significant differences between those who used them for linking to files (78.8%) and messaging (87.9%), and those who used wikis, blogs and groups (< 30%). Although they were still used like repositories – as most studies on the topic have shown (Gewerc, 2007b; Salinas, 2008), the spectrum has indeed broadened in recent years.

The areas and equipment provided by the ATE fostered the development of more innovative teaching proposals; 87% of the lecturers surveyed confirmed that the use of these areas and equipment had brought about changes in the dynamics of their classes, mainly in relation to communication with the students (78.7%), to participation (66%) and to motivation (65.2%).

6. Conclusions

Summarising a four-year project of this magnitude is a complex task. Each of its five programmes provided quantitative and qualitative data reflecting the changes that the institution had undergone. Among the project's endowments were: the purchase of equipment for the faculty's schools and classrooms; videoconferencing systems; computer rooms; a mobile computer room; the installation of the OpenFilo Wi-Fi network; improved connection facilities in buildings; the production of teaching materials for different subjects and bachelor's degree courses; books and computers for the library; the re-equipment of the grant-holders' office in the Research Centre; the creation and equipment of the Lecturers' Room; the production of dissemination materials and videoconferences; the maintenance of virtual classrooms; the implementation of an institutional blog platform; and the purchase of production and multimedia storage equipment for the ATE and the Audiovisual Documentation Centre.

In addition, with the aim of promoting the use and appropriation of new technologies and providing open access to knowledge, numerous activities to promote open access software were organised, and free lecturer training programmes were created. Of particular note was the creation of the Repository of Education Materials for Lecturer Training and Practice called 'Ansenuza',[4] as a result of the agreement with the Directorate General for Higher Education of the Province of Córdoba's Ministry of Education.

The complicity and support provided by the institutional policy was undoubtedly the key to achieving all of this. Indeed, it provided the right environment within which to regulate the

4.. http://ansenuza.unc.edu.ar/

actions that were gradually carried out. This accompaniment was clear to see in the policy aimed at strengthening teaching, which, for example, enabled the lecturer training carried out to be counted as a significant component in teaching staff accreditations. Of course, it is not sufficient simply to report the success of the actions, as they need to be integrated into the daily life of the institution. And that is where the ATE team played a crucial role, by performing operation planning and project management, solving queries and providing the interface between the institutional policies' vision and the teaching staff's practices (Cummings et al., 2005).

The work done within the context of an Ibero-American network enabled an understanding of the global in order to help the local, taking particular cultural characteristics into account.

It was sometimes a complicated road to travel; the process meant that different cultures of work and ways of doing things and of being in the institution had to be combined and made compatible.

Even though the funding from the AECID had ended at the time of writing this article, which was one of the central concerns for its continuity, it was hoped that the institution would assume the cost of the ATE team, as it had become a very important area within the institution. According to one of the key people in the project management team, it had become an actor capable of helping others to develop the very process, an aspect that was already under way in another of the network's universities.

There is still a long way to go; changes in institutions need much more time than the four years that the project lasted. The value of this cooperation experience is that it provided the initial impetus for mapping out the route that the institution alone needs to take

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ARTICLE

Latin American university students' perceptions of social networks and group work

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Abstract

In recent years, the Internet and Web 2.0 tools have played a fairly pivotal role in university education. Social software tools have stood out in particular, with social networks attracting the most attention. In the field of education, social networks have gradually become a highly valuable didactic resource because the students who populate today's university classrooms also live out a large part of their lives on those networks. Student group work is a cornerstone of the constructivist view of teaching, which can draw on resources of this type because, among other things, they foster socialisation, information searching, the attainment of a common goal, etc. But, for all of this to happen, students must have positive attitudes towards group work. This article presents the results of a study on university students' level of knowledge of social networks and their perceptions of group work. It was conducted on a sample of students from Argentina, Spain, the Dominican Republic and Venezuela. The findings particularly show that the students held high perceptions of group work and of the opportunity to work online with fellow students from different geographical areas.

Keywords

Internet, social software, university students, social networks

Percepciones de los estudiantes universitarios latinoamericanos sobre las redes sociales y el trabajo en grupo

Resumen

En los últimos tiempos la formación universitaria ha estado bastante centrada en el entorno de internet y de las herramientas de la web 2.0. Destacan dentro de este entramado las clasificadas como software social, siendo las redes sociales las que más atención despiertan. En el ámbito educativo las redes sociales se han ido dibujando como un recurso de gran valor didáctico, dado que los estudiantes que hoy habitan las aulas universitarias viven inmersos en ellas. La visión constructivista de la enseñanza, apoyada fundamentalmente en el trabajo en grupo de los estudiantes, puede alimentarse a través de este tipo de recursos, debido a que potencia, entre otros aspectos, la socialización, la búsqueda de información, el logro de una meta común, etc.; pero para ello el alumno debe tener actitudes positivas para trabajar en grupo. En este trabajo, realizado con estudiantes de Argentina, España, República Dominicana y Venezuela, exponemos los resultados obtenidos en un estudio sobre el grado de conocimiento que tiene el alumnado respecto a las redes sociales y sus percepciones para trabajar en grupo. Entre los hallazgos encontrados destaca que los estudiantes tienen una elevada percepción respecto al trabajo en grupo, junto con la posibilidad de trabajar online con compañeros que no están en su misma zona geográfica

Palabras clave

internet, software social, universitarios, redes sociales

1. Theoretical approach

Nowadays, it is practically impossible to offer or gain a university education without it involving information and communication technologies (ICTs), as these affect all the variables that intervene in the settings where learning takes place. These are not necessarily physical, as ICTs enable students

to learn anywhere, anytime, and also to set their own pace of self-regulated learning (Álvarez, 2012). Thus, e-learning has become extraordinarily powerful.

However, many experiences carried out in e-learning mode have failed owing to the students' sociocognitive isolation (Anderson, Annand & Wark, 2005). In order to address that, collaborative group educational actions have been suggested as a means of helping to create environments that are more active and participatory, that overcome the issues of isolated or independent work (Gros, González & Lara, 2009; Meirinhos & Osorios, 2009), and that strengthen what is now being referred to as 'e-learning 2.0' (Cabero, 2012). From this perspective, collaborative work relies more and more on technologies, and particularly on social networks and virtual communities (Marqués, 2011; Taya & Allenb, 2011; Callaghan & Bower, 2012; Da Mata, 2012).

Social network penetration is such that the *Social Media around the World* report, which analysed their presence in 14 countries across all continents, points out that 72% of Internet users are members of at least one social network (ONTSI, 2011). And that presence is also on the up in university education contexts (Fogel & Nehmad, 2009; Piscitelli et al., 2010; Domínguez & Álvarez, 2011; Llorens & Capdeferro, 2011; Túñez & García, 2012; Fondevila, Carrera & Del Olmo, 2012), mainly because social networks offer enormous opportunities for adapting those contexts to the methodologies implemented within the European Higher Education Area (EHEA) (Espuny, González, Lleixà & Gisbert, 2011).

This leads us to point out – as shown in two *Horizon Reports* focusing on Latin America – that social networks and collaborative work have emerged as two tools with significant penetration in educational institutions (García et al., 2011; Durall et al., 2012).

However, their incorporation into university education contexts is dependent on two particular aspects: first, students' ICT skills in an educational environment, about which there are studies that give divergent results (Marín & Cabero, 2010; Solano, González & López, 2013); and second, students' favourable attitudes towards collaborative group work (Martínez, 2003).

2. Our study

The results of our study on university students' perceptions of social software – specifically social networks – and of collaborative group work are presented in section 4 of this article. The study was conducted on a sample of students from several Latin American countries and Spain. The objectives were:

- To identify the students' perceptions of social software and of collaborative group work (in comparison to individual work).
- To identify whether the country of provenance gives rise to differences in perceptions of group work and individual work.
- To identify which social software tools are used most by the students.

3. Method

An adapted version of the questionnaire by Anderson and Poellhuber (2009) ("Social Software survey used with unpaced undergrad") was used for data collection. The original questionnaire had 91 items divided into the following dimensions: Identification, Learning Preferences, Technical Skills, Social Software Experience, Social Software for Learning, Confidence in Distance Education Abilities, and Wrap up. The questionnaire was adapted by incorporating an identification variable (university of provenance) and removing the last two dimensions, as they did not fit with our study objectives. The final version of our questionnaire had 68 items divided into the following dimensions: General Aspects (university, gender, etc.), Individual or Group Work Preferences, Technical Skills, Web 2.0 Tool Experience and Use of Different Social Software Tools in Distance Education.

The questionnaire was administered via the Internet in autumn 2012 and can be viewed here http://www.sav.us.es/encuestas/redsocial/index.htm. Given that the questionnaire had been modified, Cronbach's alpha test was performed to determine its reliability. The value obtained was 0.860, a figure that, according to Mateo (2006), could be considered high.

There were 1,040 participants from universities in Spain (University of Seville, University of the Basque Country and University of Cordoba), Venezuela (Metropolitan University and University of Carabobo), the Dominican Republic (Pontificia Universidad Católica Madre y Maestra, PUCMM) and Argentina (National Technological University, UTN). Of the participants, 70% were female, 45.65% were 17-20 years old, 26.99% were 21-24 years old and 11.67% were 25-28 years old.

Furthermore, 64.9% stated that they had undertaken Internet-mediated activities, and 94.25% stated that they regularly accessed the Internet for educational purposes.

4. Results

Starting with the students' learning preferences, Table 1 shows the results obtained.

Of the participants, 89.73% indicated that they knew how to work by themselves because they replied "SD" or "D" to the statement "I do not know how to work by myself", though they preferred working in groups, as we can see from the following replies, where the sum of the percentages for the "A" and "SA" options stands out from the others:

- Group work is helpful to put together everyone's ideas when making a decision (86.55%).
- I like to be able to use the ideas of other people as well as my own (85.90%).
- We get the work done faster if we all work together (84.70%).
- Working with other students can help me learn (97.15%).
- I like to be able to use the ideas of other people as well as my own (63.53%).

Table 1. Learning Preferences

	SD	D	N	A	SA
	%	%	%	%	%
Working with a group leads to poor results.	28.16	44.44	23.37	2.78	1.25
A teacher can help most by working with students in groups.	3.07	1.82	4.22	50.77	40.12
I prefer to work by myself so I can go as fast as I like.	5.20	26.49	39.79	21.00	7.51
Group work is helpful to put together everyone's ideas when making a decision.	3.65	3.55	5.96	52.83	34.01
When a group or class needs something important done, working it out in a group helps me more than working it out on my own.	3.17	10.96	20.96	48.56	16.35
Working in a group scares me.	50.29	38.87	7.10	2.98	0.77
I do not like working by myself.	15.01	30.99	37.92	12.70	3.37
In a group discussion, we never reach important conclusions.	24.57	50.39	18.47	6.07	2.50
I like to work in groups when taking courses.	1.61	9.27	44.56	36.90	7.66
I like to be able to use the ideas of other people as well as my own.	1.64	3.67	8.79	65.80	20.10
If I work by myself most of the time, I become lonely and unhappy.	23.08	43.45	20.27	10.48	2.72
We get the work done faster if we all work together.	2.90	2.71	8.70	37.78	47.92
I do better quality work by myself.	6.89	34.92	45.30	9.99	2.91
I like to help other people do well in a group.	1.36	2.33	8.72	62.40	25.19
If I work by myself now, I will manage better later.	5.91	30.43	35.85	22.67	5.14
I do not know how to work by myself.	47.00	42.73	7.75	1.55	0.97
I like my work best if I do it myself without anyone's help.	6.99	33.50	38.74	16.99	3.79
Other students do not need to know what I do when I am studying.	8.51	30.66	39.75	18.38	2.71
Working in a group now helps me work with other people later.	1.35	1.35	5.70	48.89	42.71
I like to keep my ideas to myself.	1.26	5.63	24.83	57.03	11.25
The teacher can help most by choosing work that is right for each student.	1.55	7.86	19.98	56.55	14.06
Working with other students can help me learn.	0.49	0.68	3.69	55.83	39.32
I like to work on my own without paying attention to other students.	24.88	51.80	17.88	4.66	0.78
I do not like working with other students.	34.01	48.06	11.53	4.26	2.13

SD=Strongly Disagree, D=Disagree, N=Neither Agree nor Disagree, A=Agree, SA=Strongly Agree.

We can also see this preference in the items formulated negatively, where the sum of the "SD" and "D" replies stands out from the others:

- Working with a group leads to poor results (72.60%).

- Working in a group scares me (89.16%).
- In a group discussion, we never reach important conclusions (74.96%).
- I like to work on my own without paying attention to other students (75.68%).
- I do not like working with other students (82.47%).

To the statement "I prefer to work by myself so I can go as fast as I like", reply option "N" had the highest percentage (39.79%). On the other hand, the students perceived that group work would be a necessary prerequisite for future learning and work:

- If I work by myself now, I will manage better later (only 27.81% replied "A" and "SA").
- Working in a group now helps me work with other people later (91.60% replied "A" and "SA").

Asked about their preferences regarding certain aspects of group work, the three reply options that accounted for nearly 50% of the distribution were:

- Sharing resources on the Internet (18.44%).
- Working on a project (17.55%).
- Doing an assignment or courses (15.55%).

By country, the results obtained were:

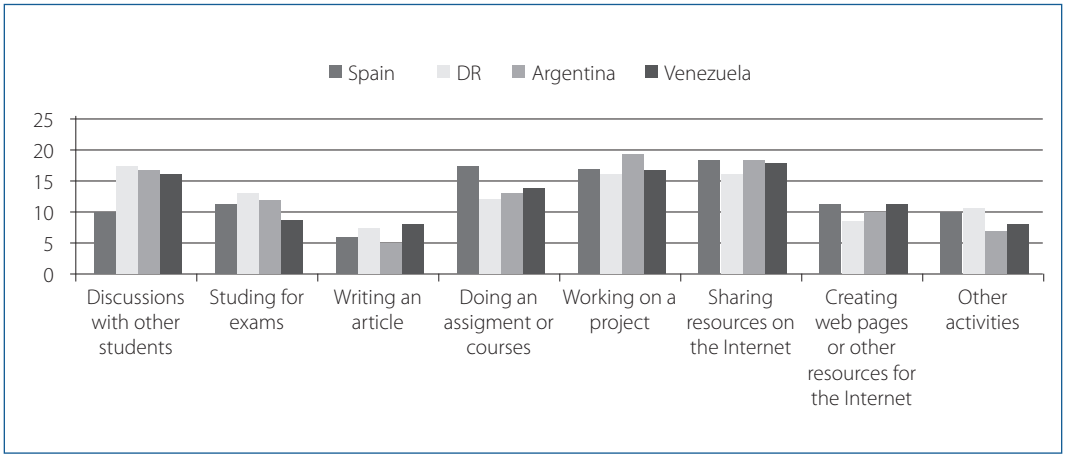

Chart 1. Preferences regarding certain aspects of group work

A high percentage of the students rated their group work experience as "positive" (57.25%), followed by "neutral" (20.78%) and "very positive" (19.61%). It should be noted the sum of the negative ratings was less than 3%. These data were similar for all the countries (Chart 2).

A high percentage of the students stated that they were "interested" in group work (63.17%), followed by "very interested" (23.09%). It should be noted that the sum of "not at all interested" and "not very interested" replies was less than 8%. These data were also similar for all the countries (Chart 3).

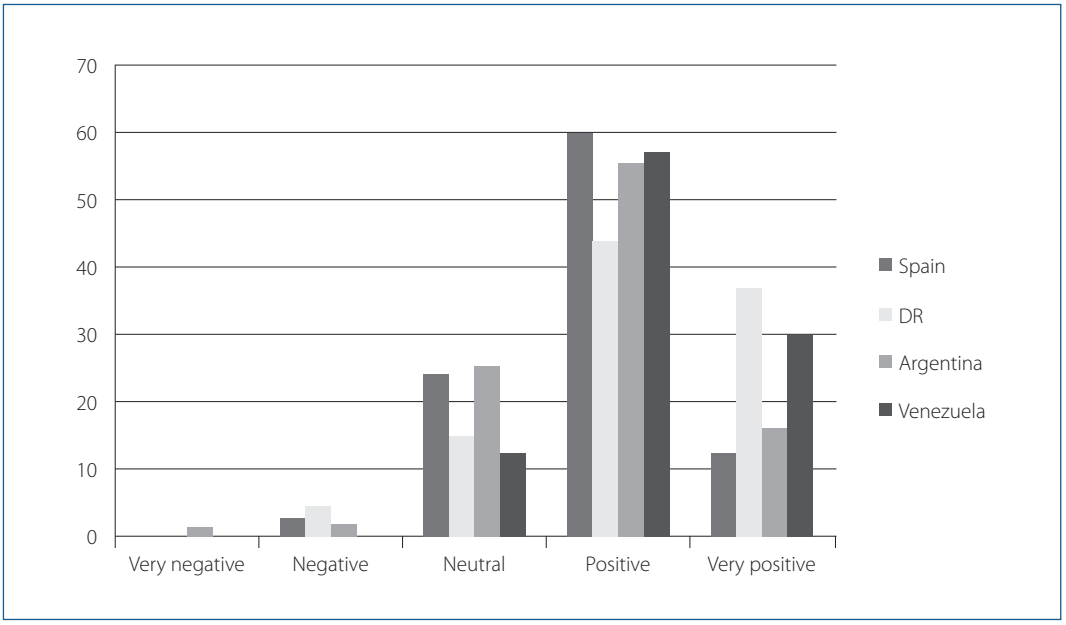

Chart 2. Group work experience

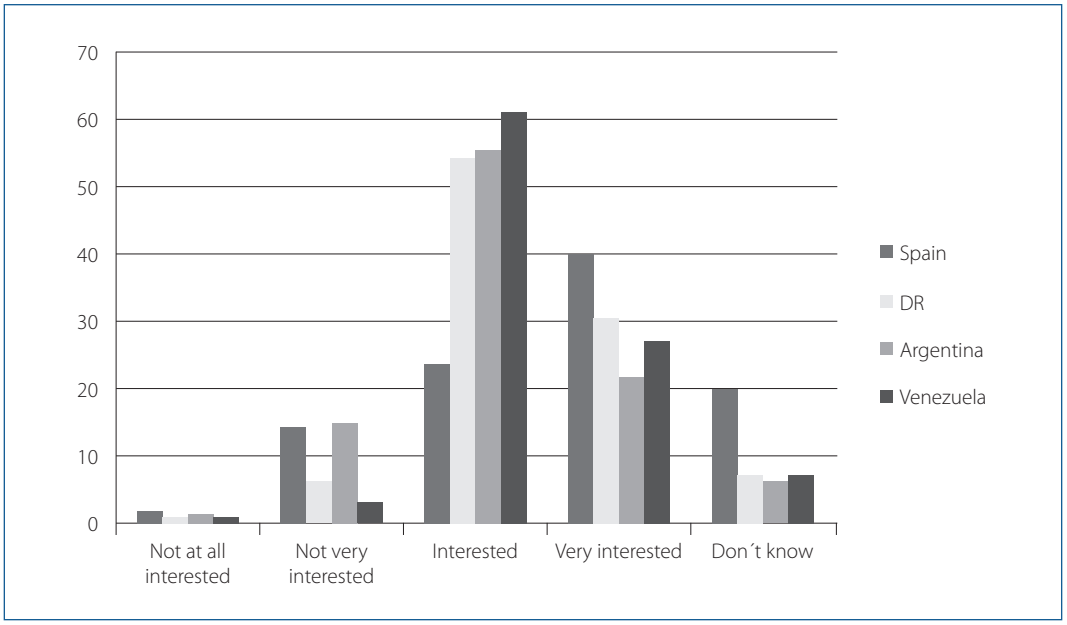

Chart 3. Interest in working with other students

Moving on to the students' technical skills with regard to handling the various technologies, Table 2 below shows the results obtained.

As we can see, their perceptions of ICTs were positive. In some cases, the sum of the "A" and "SA" options is more than 80%.

- I like using computers for research and education (90.67%).

- I like to communicate with others using computer-supported communication (e.g., e-mail, text messaging) to support my learning (87.46%).
- I feel at ease when working with computers (84.65%).

Table 2. Technical Skills

	SD	D	N	A	SA
	%	%	%	%	%
I like using computers for research and education.	1.47	1.28	6.58	51.32	39.35
I like to communicate with others using computer-supported communication (e.g., e-mail, text messaging) to support my learning.	0.79	2.76	8.98	50.54	36.92
I spend a lot of time on the Internet.	3.04	15.21	24.24	34.45	23.06
I know how to send and receive messages and attachments through various communication tools (e-mail, instant messaging, etc.).	1.67	1.38	1.87	33.07	62.01
My computer is safe from threats that may arise when I connect to the Internet.	2.45	7.56	17.66	45.04	27.28
I am good at finding precisely what I am looking for when I use Internet search engines (Google, Yahoo, etc.).	0.29	3.93	13.95	51.87	29.96
When other students become confused about how to do something with computers, I am able to find information to resolve the problem (help function, documentation, etc.).	1.38	9.92	31.83	39.00	17.88
I feel confident about writing documents on word processors (e.g., underlining, using bold, creating tables, etc.).	0.99	1.38	6.11	36.95	54.58
I know how to install software to support my learning using computers.	5.21	19.06	20.04	29.37	26.33
I feel at ease when working with computers.	0.79	2.76	11.71	44.59	40.16
I can troubleshoot most problems associated with using a computer.	3.64	17.99	30.29	31.17	16.91
I have extensive experience using computers.	2.07	16.39	30.60	32.97	17.97
I am good at using presentation software (e.g., PowerPoint).	1.68	7.12	18.30	43.52	29.38
I am good at using spreadsheets (e.g., Excel).	6.05	25.69	27.48	28.08	12.70
I am able to set up and manage file directories.	4.45	18.97	30.14	31.03	15.42

SD=Strongly Disagree, D=Disagree, N=Neither Agree nor Disagree, A=Agree, SA=Strongly Agree.

They also stated that they were able to carry out various activities, as we can see from the percentages for the sum of the "DA" and "SA" options:

- I know how to send and receive messages and attachments through various communication tools (e-mail, instant messaging, etc.) (95.08%).
- I am good at finding precisely what I am looking for when I use Internet search engines (Google, Yahoo, etc.) (81.83%).
- I feel confident about writing documents on word processors (e.g., underlining, using bold, creating tables, etc.) (90.53%).
- I am good at using presentation software (e.g., PowerPoint) (72.90%).

The students recognised that they "spend a lot of time on the Internet" because the sum of the "A" and "SA" options is 57.51%. We did not find high percentages for the "SD" (3.04%) and "D" (15.21%) replies. The results obtained were similar for all the countries.

Regarding the students' social software experience, Table 3 below shows the results obtained.

Table 3. Social Software Experience

	N	B	I	A	E
	%	%	%	%	%
What has been your experience with blogs?	13.54	32.21	27.57	23.52	3.16
What has been your experience with Wikis?	32.84	30.28	27.22	8.28	1.38
What has been your experience with social bookmarking (e.g., Delicious, Diigo)?	71.74	15.82	8.46	3.28	0.70
What has been your experience with web conferencing? E.g., Elluminate, Adobe Connect, Skype.	23.96	30.79	17.72	21.39	6.14
What has been your experience with social networking? E.g., Facebook, MySpace, Ning.	2.67	6.43	13.75	46.09	31.06
What has been your experience with photo publishing? E.g., Flickr, Picasa, Facebook.	5.32	13.10	21.28	42.07	18.23
What has been your experience with video sharing? E.g., YouTube, Vimeo.	8.22	18.42	30.79	29.50	13.07
What has been your experience with podcasting?	67.29	17.84	11.00	2.97	0.89
What has been your experience with immersive 3D software? E.g., Second Life.	77.40	15.86	4.36	1.49	0.89

N=None, Non-User: have no idea about it; B=Beginner: Have some knowledge about it; I=Intermediate: Can search, tag and comment; A=Advanced: Own an account and do contribute with postings, files or resources; E=Expert: I know most everything about using this tool.

The data obtained allow three groups to be formed according to the skills level the students claim to have. One group includes technologies for which they claimed to have "advanced" skills: social networking (46.93%) and photo publishing (42.97%); and another includes technologies for which their level was "none, non-user": Wikis (32.84%), social bookmarking (71.74%), podcasting (67.29%) and immersive 3D software (77.40%). Lastly, the third group includes technologies where the "beginner" and "intermediate" options had similar percentages: blogs (32.21%) and web conferencing (30.79%).

These data allow us to assert that the students' skills were non-existent or poor in relation to many of the technologies, although they did claim to have "intermediate" and "advanced" skills in relation to photo publishing and video sharing. The "advanced" and "expert" levels of their social networking experience stand out (77.15%).

Regarding the social networks (Facebook, Twitter, LinkedIn and Hi5), 66.34% of the students stated that Facebook was the one they used the most, whereas 31.60% preferred Twitter. Only 2% of them indicated the other two options: LinkedIn and Hi5.

By country, Chart 4 below shows the results obtained. Facebook stands out from the rest of the social networks in every country but Spain.

The aim of the final part of the questionnaire was to ascertain how interested the students were in having and using specific social software tools on their courses (Table 4).

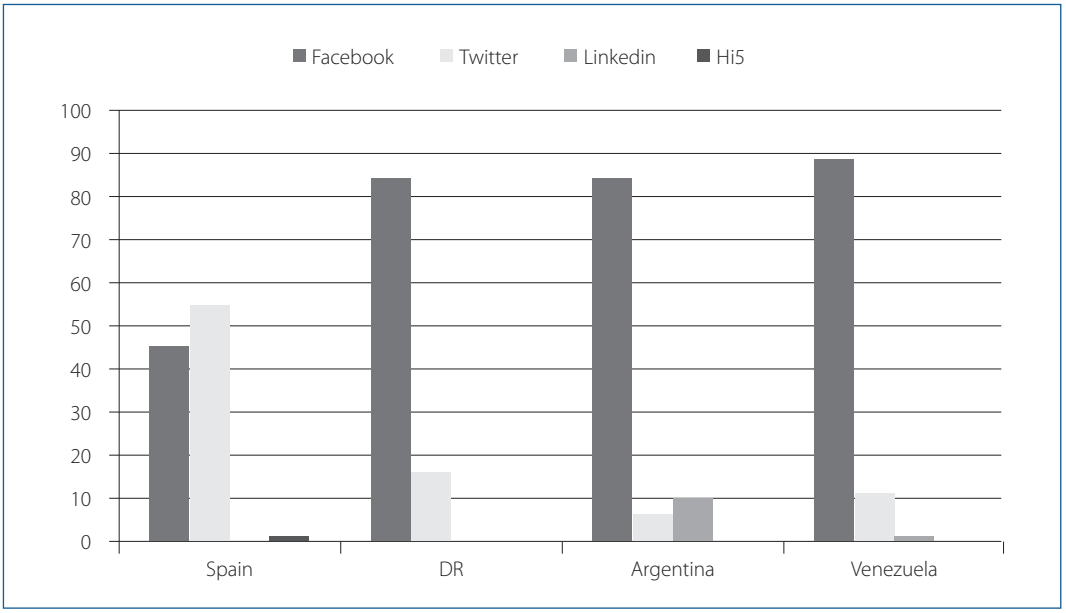

Chart 4. Social Network Use

Table 4. Social Software for Learning

	NAI	NVI	I	VI	DK
	%	%	%	%	%
How interested are you in having Wikis used on your course?	5.65	19.52	47.37	14.77	12.69
How interested are you in having social bookmarking tools used on your course? E.g., Delicious, Diigo.	11.96	26.82	34.30	8.08	18.84
How interested are you in having web conferencing tools used on your course? E.g., Elluminate, Adobe Connect, VIA.	5.89	18.68	47.05	19.78	8.59
How interested are you in having social networking tools used on your course? E.g., Facebook, MySpace, Ning.	3.81	12.04	48.04	34.60	1.50
How interested are you in having photo publishing tools used on your course? E.g., Flickr, Picasa.	4.30	18.02	48.85	23.62	5.21
How interested are you in having video download and sharing tools used on your course? E.g., YouTube, Vimeo.	1.60	7.20	51.80	37.70	1.70
How interested are you in having podcasting tools used on your course?	9.12	22.34	38.38	11.42	18.74
How interested are you in having social networking tools like Twitter and Facebook used on your course?	4.79	13.7	43.21	37.03	1.80
How interested are you in having e-portfolio tools used on your course?	5.46	18.67	44.49	14.60	16.78

NAI=Not at All Interested, NVI=Not Very Interested, I=Interested, VI=Very Interested, DK=Don't Know

As we can see, the most popular option was "interested". However, three of the items had high percentages for the "not very interested" reply option. These items were "How interested are you in having social bookmarking tools used on your course?" (19.52%), "How interested are you in having podcasting tools used on your course?" (22.34%), and "How interested are you in having e-portfolio tools used on your course?" (18.67%).

One of our objectives was to identify whether there were any significant differences between the students from the different countries in the four large dimensions of the questionnaire. To that

end, we formulated two classic hypotheses: the null hypothesis (H0), referring to the non-existence of significant differences, and the alternative hypothesis (H1), which went in the opposite direction.

Table 5. Kruskal-Wallis Statistic

	K-Wallis	*Level of significance*
Learning Preferences	5.105	0.164
Technical Skills	192.909	0.000(**)
Social Software Experience	42.530	0.000(**)
Social Software for Learning	39.468	0.000(**)

**=significant at 0.01

We used the Kruskal-Wallis statistic (Gibbons & Chakraborti, 2003) for independent samples, and performed the analysis with SPSS. Table 5 below shows the results obtained.

Table 6. Differences between the Countries

Samples	*Statistical test*	*Sig.*
Technical Skills		
Spain-Dominican Republic	-25.311	1.000
Spain-Venezuela	-111.478	0.000(**)
Spain-Argentina	-364.027	0.000(**)
Dominican Republic-Venezuela	-86.166	0.085
Dominican Republic-Argentina	-338.716	0.000(**)
Venezuela-Argentina	252.549	0.000(**)
Social Software Experience		
Dominican Republic-Spain	119.625	0.001(**)
Venezuela-Spain	4.152	1.000
Spain-Argentina	-120.243	0.000(**)
Dominican Republic-Venezuela	-115.473	0.007(**)
Dominican Republic-Argentina	-239.868	0.000(**)
Venezuela-Argentina	124.395	0.000(**)
Social Software for Learning		
Spain-Dominican Republic	-67.591	0.226
Spain-Venezuela	-127.679	0.000(**)
Argentina-Spain	26.547	1.000
Dominican Republic-Venezuela	-60.088	0.540
Argentina-Dominican Republic	94.138	0.780
Argentina-Venezuela	-154.226	0.000(**)

**=significant at 0.01

These results allowed us to reject H0 for the "Technical Skills", "Social Software Experience" and "Social Software for Learning" dimensions, with an alpha value of 0.01, and accept it for the "Learning Preferences" dimension, where we did find significant differences between the different universities. In order to establish where the differences between the countries resided, we applied the Dunn test (Dunn, 1964) (Table 6).

As we can see, the biggest differences in the three dimensions were between students in Argentina and Spain, and the Dominican Republic and Venezuela..

5. Discussion of results and conclusions

The study presented here has enabled us to put forward several ideas for the incorporation of different strategies and ICTs into present-day e-learning. Regarding the first objective (to ascertain the students' perceptions of social software and of collaborative group work (in comparison to individual work)), it should be noted that the students, irrespective of the Latin American country, had positive attitudes towards group work and considered that it did not have a negative impact on learning outcomes. That leads us to assert that, initially, there are significant predispositions and attitudes towards group work. Consequently, teachers should not be afraid to incorporate it into e-learning processes. At the same time, it could be considered a strategy for overcoming one of the variables of failure in learning of this type: the students' sociocognitive isolation.

Regarding the second objective (to identify whether the country of provenance gives rise to differences in perceptions of group work and individual work), we can conclude that, irrespective of their country of provenance, the students participating in the study perceived that group work was one of the ways of working in the knowledge society, which would facilitate the implementation of collaborative work actions between students from different countries. This coincides with the findings of other studies at lower educational levels (Túñez & García, 2012), and with going beyond the roles traditionally allocated in the teaching-learning process (Tinmaz, 2012). Our study also showed that the students had extensive experience of using the Internet for educational work. Thus, educational experiences to which this technology could be applied were welcomed by the students. In the Latin American context, this aspect will enable us to work on the students' so-called 'virtual mobility' for learning.

And lastly, regarding the third objective (to identify which social software tools are used most by the students), we should be point out that, if social media are knocking on the doors of educational institutions, and if our students' knowledge of them and perceptions of group work are as good as they claim, then the expectations of what can be achieved by incorporating such media into education should be high. These results differ from those obtained from other studies (Marín & Cabero, 2010), which indicated that students had limited knowledge of Internet tools and of their educational value.

The compiled data support the efforts made by many universities to incorporate social networks into educational actions (Baltaci-Goktalay & Ozdilek, 2010; Piscitelli et al., 2010).

Finally, it should be noted that the questionnaire used (Anderson & Poellhuber, 2009) is a very useful and valid tool for ascertaining how interested a certain part of the population is in group work, and also for identifying how students use social software.

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ARTICLE

Twitter's contribution to improving strategic communication in Latin American universities

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Abstract
An analysis was performed to identify the key points for achieving effective strategic communication in universities via Twitter. An evaluation and comparison was made of how 263 universities used Twitter by looking at their followers, tweets, retweets, replies and hashtags. The main purposes for its use were identified as boosting communication among members of its community and disseminating institutional information. Many Latin American universities are active on Twitter, but they need community managers to manage their official profiles to optimise communication and to increase their reach by making the most of their users' activity.

Keywords
community manager, communication, promotion, Twitter, universities

Contribución de Twitter a la mejora de la comunicación estratégica de las universidades latinoamericanas

Resumen
Se analizan las claves para una comunicación estratégica eficaz de las universidades en Twitter. Se evalúa y compara el uso que 263 universidades hacen de Twitter mediante susseguidores, tweets, retweets, replies y hashtags. *Así se obtienen las tendencias prioritarias de su uso para dinamizar la comunicación entre los miembros de su comunidad y difundir información institucional. Muchas universidades iberoamericanas tienen presencia activa en Twitter, pero necesitan a un* community manager *para gestionar sus perfiles oficiales, optimizar su comunicación e incrementar su alcanceaprovechando la actividad de sus usuarios.*

Palabras clave
community manager, *comunicación, promoción, Twitter, universidades*

1. Introduction: Twitter in the university environment

Web 2.0 constitutes an ecosystem in which any user can contribute and share content in a creative way (Forkosh-Baruch & Hershkovitz, 2011; Grosseck & Holotescu, 2010). It has become a setting for teaching-learning and makes an interesting contribution to the creation of knowledge (Tilfarlioglu, 2011). Universities view Web 2.0 as a valuable source of information and increasingly take part in social networks with the members of their educational community (Chamberlin & Lehmann, 2011; Hergüner, 2011). Most of them keep their profiles up-to-date and interact with members of their community, thus enabling quick and direct feedback. This contributes to improving their corporate image (Kierkegaard, 2010), to optimising their service strategies and to encouraging participation in the educational community.

Social networks are an invitation to universities to integrate new social technologies and adopt them as indispensable resources (Griffith & Liyanage, 2008). Twitter, Facebook, YouTube and other networks allow virtual encounters to acquire a social value (Agarwal & Mital, 2009). Undeniably, they are communication channels (Boyd & Ellison, 2007; Linvill, McGee & Hicks, 2012; Alloway & Alloway,

2012), and they are increasingly used in the university environment (Roblyer et al., 2010; Kietzmann et al., 2011; Guzmán, Del Moral & González, 2012). The social practices of university students are linked to the use of networks (Madhusudhan, 2012); they are aware of their usefulness (Haneefa & Sumitha, 2011) and 76% of them use these networks to complete tasks and do activities with their fellow students (Del Moral & Villalustre, 2012). Furthermore, lecturers use them to interact with their students (Junco, Heiberger & Loken, 2011).

In fact, Twitter facilitates interaction between millions of users who have an account, by following each other's activity (Ebner, Lienhardt, Rohs & Meyer, 2010). Some of the main advantages are: the use of tweets – short posts that have a maximum of 140 characters – (Chamberlin & Lehmann, 2011; Veletsianos, 2011) that reflect personal opinions, which can include links, photos, videos and hashtags (words or phrases beginning with #) for discussing different issues or events that emerge spontaneously between users (Huang, Thornton & Efthimiadis, 2010). Other basic elements are: retweets, following, followers and replies. Tweets enable people to interact online by replying to a user that tweets; sharing a tweet produces a retweet and the information spreads virally (Boyd, Golder & Lotan, 2010; Chamberlin & Lehmann, 2011). 'Following' are the users that a particular user follows, and 'followers' are the users that follow a particular user.

Dabbagh and Kitsantas (2012), Forkosh-Baruch and Hershkovitz (2011), Özsoy (2011), and Shafique, Anwar and Bushra (2010) support the idea of using Twitter for exchanging information, communicating and interacting with students. Özsoy (2011) asserts that it allows users to come closer together and to discuss ideas because interaction is so fast. Ebner et al. (2010), and Stieger and Burger (2010) recognise that, in the university environment, it is useful for sharing information and fostering discussions among students who are interested in specific issues (Rinaldo, Tapp & Laverie, 2011). It encourages learning by getting the community to participate (Rampai & Sopeerak, 2011), and promotes exchanges of opinions and experiences among people in different groups and projects, which can be rewarding (Rinaldo et al., 2011). Hashtags enable conferences, seminars, etc. to be transmitted in real time, surveys to be conducted and questions to be addressed directly to speakers.

Twitter helps to disseminate information about conferences, courses, grants, etc., keeps users up-to-date (Fields, 2010; Milstein, 2009), encourages them to take part in forums, conferences and seminars (Grosseck & Holotescu, 2010), and invites the educational community to take part in social activities (Atkinson, 2009). It is useful for sharing promotional campaigns linked to the capacity for territorial consolidation of some universities, to advertise the courses on offer, to improve their competitiveness (for example, the Campus of Excellence in Spain), to attract new students, to publish the services on offer, to provide information about their cultural programme, and so on (Fields, 2010; Milstein, 2009; Mistry, 2011).

The study presented here firstly identified the two main purposes of Twitter use by Latin American universities: a) to foster the dissemination of information of interest to the university community and b) to facilitate communication and interaction among its members. It secondly identified the key points of how it could be turned into a useful tool for creating an effective communication strategy. To begin with, this article covers some general considerations about Twitter use in an academic environment and the methods employed by university communities to take advantage of it, both to encourage members' participation and also to improve their corporate image. It then goes on to

present the empirical study, whose multivariate analysis enabled the evaluation and comparison of Twitter use by 263 Latin American universities in the Webometrics ranking (Prieto, 2012), all of which had active official accounts.

2. Empirical study: methodology

The focus of this study was quantitative and the objectives were: 1) to describe the diversity of institutional uses of Twitter made by the sample of 263 Latin American universities in the Webometrics ranking (Prieto, 2012); and 2) to identify the opportunities that Twitter offers them for raising the visibility of the university as an academic institution and for promoting the sharing of information, experiences and activities among members of the university community.

2.1. Procedure and data collection

The data were collected from the Internet in a similar way to the procedure used by Bae & Lee (2012) in their research on Twitter use in organisations. In other words, relevant data were collected from the tweets, retweets and replies – taken as indicators – in the official Twitter accounts/profiles of each university, hence the number of followers that each university had and the number of users that each university followed were measured.

Two web analytics tools were used, TweetReach and TweetStats. TweetReach, which specialises in measurements on each user's Twitter account, was used to count the number of tweets and replies. TweetStats compiles the tweets in each user's account, and also the hashtags and tweets in their official accounts. They were scored from 1 to 5 according to the reach of each tweet (Likert scale: 1 = very low reach and 5 = very high reach). Subsequently, these tweets were classified to identify their priorities: consolidation of their presence, reinforcement of their corporate reputation and brand image, increase in communication and interaction among the members of the educational community, and so on. The aim of doing this was to infer the opportunities that Twitter presence and activity offered to Latin American universities.

The following variables were defined in order to categorise the universities in the sample:

(a) Variables relating to the context of the universities: 1) country; 2) age; 3) number of students enrolled; 4) ownership

(b) Variables relating to the universities' Twitter presence and activity: 1) followers; 2) following; 3) tweets; 4) replies.

The data were collected by means of associating tags relating to the defined categories, with the subsequent classification of tweets by each university during the period studied (January to March 2012). A descriptive analysis of the level of Twitter use by each university in the sample was performed on the basis of these data. Subsequently, multivariate techniques, such as linear regression, were used to identify the relationship between variables, and cluster analysis was used to classify

Twitter use, taking account of the tendencies of the followers of the university accounts according to the level of association between variables. For this analysis, Ward's method was considered for adjusting the data and evaluating the squared Euclidean distance between clusters. Finally, Pearson's Chi-squared statistic was applied in order to study the dependence of the variables: number of students, tweets and followers. The estimated level of confidence was 95%. The statistical analysis software used was SPSS (version 18).

2.2. Sample

The study sample was made up of the 263 Latin American universities listed in the Webometrics ranking (Prieto, 2012), and they were grouped according to the defined variables:

1) Country: Spain (29.3%) and Brazil (19.8%) accounted for 49.1% of the distribution of the universities in the sample by country (Table 1). The remaining percentage was shared between Mexico (7.2%), Argentina (6.1%), Colombia (6.1%), Chile (5.3%) and the Antilles, Bolivia, Costa Rica, Cuba, Ecuador, El Salvador, Guatemala, Honduras, Nicaragua, Panama, Paraguay, Peru, Portugal, Puerto Rico, the Dominican Republic, Uruguay and Venezuela (together accounting for 26.2%).

Country	Number	Percentage	Cumulative percentaje
Antilles	1	0,4	0,4
Argentina	16	6,1	6,5
Bolivia	4	1,5	8,0
Brazil	52	19,8	27,8
Chile	14	5,3	33,1
Colombia	16	6,1	39,2
Costa Rica	7	2,7	41,8
Cuba	1	0,4	42,2
Ecuador	8	3,0	45,2
El Salvador	3	1,1	46,4
Spain	77	29,3	75,7
Guatemala	2	0,8	76,4

Country	Number	Percentage	Cumulative percentaje
Honduras	7	2,7	79,1
Mexico	19	7,2	86,3
Nicaragua	5	1,9	88,2
Panama	5	1,9	90,1
Paraguay	4	1,5	91,6
Peru	7	2,7	94,3
Portugal	4	1,5	95,8
Puerto Rico	3	1,1	97,0
Dominican R.	1	0,4	97,3
Uruguay	2	0,8	98,1
Venezuela	5	1,9	100,0
Total	263	100,0	100,0

Table 1. Distribution of the universities by country. Source: Own elaboration.

2) Age: a) under 20 years (16.8%); b) 21-40 years (23.3%); and c) over 40 years (59.9%). Universities over 100 years old formed the biggest group, with a mean age of 130 years (standard deviation = 165). The youngest universities were the Federal University of Latin American Integration (UNILA) (3 years), the Technical University of Costa Rica (UTCR) and the International University of La Rioja (UNIR) (5 years), and the oldest were the University of Salamanca and the University of Coimbra (795 and 723 years, respectively).

The Spanish universities that were less than 40 years old made up the biggest group, together with the Brazilian universities that were more than 40 years old (Table 2), and the Argentinean, Colombian and Mexican universities.

Country	Ownership		Age		
	Public	Private	<20 years	21-40 years	>41 years
Antilles	1	0	0	0	1
Argentina	14	2	3	3	10
Bolivia	3	1	0	0	4
Brazil	45	7	5	2	45
Chile	9	5	0	6	8
Colombia	9	7	1	2	13
Costa Rica	5	2	1	3	2
Cuba	1	0	0	0	1
Ecuador	4	4	0	1	7
El Salvador	1	2	0	1	2
Spain	50	27	31	24	22
Guatemala	0	2	0	0	2

Country	Ownership		Age		
	Public	Private	<20 years	21-40 years	>41 years
Honduras	3	4	1	4	2
Mexico	**15**	4	0	5	**14**
Nicaragua	3	2	0	2	3
Panama	2	3	1	3	1
Paraguay	3	1	0	2	2
Peru	3	4	0	1	6
Portugal	4	0	0	1	3
Puerto Rico	3	0	0	0	3
Dominican Republic	0	1	0	1	0
Uruguay	1	1	1	0	1
Venezuela	4	1	0	0	5

Table 2. Distribution of the universities by ownership and age. Source: Own elaboration.

3) Ownership (public or private): Of the universities in the study, 69.6% were public and the rest (30.4%) were private (Table 2). The majority of the public universities in the study were in Spain (50), followed by Brazil (45), Mexico (15) and Argentina (14). Similarly, the majority of the private universities were in Spain (27), Brazil (7) and Colombia (7).

4) Number of students enrolled: Three numerical ranges were established: a) fewer than 20,000 (56.6%); b) 20,001-40,000 (26.2%); and c) more than 40,000 (17.2%). The mean value for the number of enrolled students was 38,226 (standard deviation = 44,263). The University of Buenos Aires had the highest number of students (316,050), followed by the National Autonomous University of Mexico (UNAM) (290,000). The institutions with the lowest number of students were the University Abat Oliba (CEU) (782) and the Catholic University Santa Teresa de Jesús of Ávila (Spain) (758).

3. Results

3.1. Descriptive data for the sample

Of the universities in the study, 93.2% had official Twitter accounts, and all of them had at least three accounts. In fact, the universities had a mean of 11 Twitter accounts (standard deviation = 6.90). The universities with the highest number of profiles were: the National University of Distance Education (UNED, Spain) (27), the Technical University of Valencia (UPV) (25) and the University of Antioquia in Colombia (25). The universities with the lowest number of profiles were: the Autonomous University

of Chiriquí (Panama), the *Universidad Abierta Interamericana* (Argentina) and the University of Costa Rica, which had only one account each. In every case, one profile was taken as the official account, and all the other profiles were considered secondary accounts.

The universities with the highest number of profiles were in Colombia, the Dominican Republic, Brazil and Chile (Table 3). The highest number of tweets was recorded in universities in El Salvador, Venezuela, the Dominican Republic and Chile. The accounts most followed were those of universities in Venezuela, Chile, Colombia and Peru. And the highest number of followers was found in universities in Venezuela, Chile, Mexico and Colombia.

Countries	Profiles		Following	
Antilles	5	2.529	1.042	2.300
Argentina	7	1.289	256	2.517
Bolivia	.	.	.	0
Brazil	12	2.193	453	6.376
Chile	12	2.829	1.613	11.453
Colombia	15	2.220	1.385	7.435
Costa Rica	5	938	278	2.636
Cuba	.	.	.	0
Ecuador	8	1.708	123	1.401
El Salvador	9	6.388	342	3.882
Spain	9	1.531	642	3.064
Guatemala	5	1.893	96	3.045

Countries	Profiles		Following	
Honduras	4	861	4	1.327
Mexico	10	2.153	929	11.006
Nicaragua	4	92	13	309
Panama	3	797	92	1.012
Paraguay	4	829	149	430
Peru	8	1.369	1.204	4.350
Portugal	8	320	406	1.378
Puerto Rico	3	1.338	644	3.123
Dominican Republic	13	3.641	44	5.112
Uruguay	.	.	.	0
Venezuela	10	6.052	2.967	13.057

Table 3. Distribution of the universities by country and by Twitter indicators.
Source: Own elaboration.

The most Twitter activity came from universities in Chile, Colombia and Venezuela. There was a lack of activity from universities in Bolivia, Cuba and Uruguay. It was evident that the universities' activity on Twitter was very uneven, as inferred by the indicators studied:

1) Followers. The mean value was 13,104 (standard deviation = 27,924.1). The University of Chile had the highest number of followers (119,100), followed by the National Autonomous University of Mexico (UNAM) (111,377). Some universities had hardly any followers, such as Comillas Pontifical University (Spain) and the Autonomous University of Chiriquí (UNACHI, Panama).

2) Following. The mean value was 253 accounts that the official profiles of the universities in the sample were following (standard deviation = 425.9). The maximum values were reached by the University of Granada (14,015), and then the Central University of Venezuela (12,400). The universities following the lowest number of accounts were the Pontifical Catholic University of Minas Gerais (PUC-MG) (Brazil) and the Pontifical Xaverian University (Colombia).

3) Tweets. The universities that had the highest number of tweets were the Pontifical Catholic University of São Paulo (PUC-SP) (Brazil) (26,032), and the Central University of Venezuela (UCV, 12,087),

and the universities that had the lowest number of tweets were Ramon Llull University (URL, Spain) and the Pontifical Xaverian University (Colombia). The mean number of tweets was 2,078 (standard deviation = 2,695.8).

4) Replies. The mean number of replies received by the universities was 9 (standard deviation = 4.8). The universities that generated the highest number of replies were the University of Barcelona (38) and the University of the Sinos Valley (UNISONOS, Brazil), the *Corporación Universitaria Minuto de Dios* (Colombia) and the University of Panama (37 each); and those that generated the least replies were the Federal University of Espirito Santo (Brazil), the Technical University of Madrid (UPM) and Jaume I University in Castellón (Spain), with only 1 reply each.

5) Hashtags for disseminating their services. The universities generated the most hashtags for libraries (96.1%), calls of various types (94.4%), invitations and promotions of their services (93.0%), descriptions of their corporate image (93.0%) and news (91.4%).

6) Hashtags for encouraging communication. Of the topics tweeted by the universities, 100% of them were aimed at the students and 69.3% were tweets by lecturers.

3.2. Institutional Twitter use

Based on the descriptive data for the sample, and the data obtained from the user accounts, the pertinent contrasts were performed and following results were obtained:

Indicators of Twitter activity	Mean	Standard deviation	Number of universities
Followers	13.104	27.924,10	245
Following	253	425,9	245
Tweets	2.078	2.695,80	245
Replies	9	4,8	245

Table 4. Summary of activity in the accounts of the universities studied.
Source: Own elaboration, based on Twitter (2012).

a) Twitter, a tool for communicating with members of the educational community

A high level of standard deviation was found in Twitter activity (Table 4), which demonstrated an uneven level of participation by the universities, and although not all of them tweeted, many universities used it as a communication tool based on the participation of its users.

There was a direct relationship between the position occupied by the universities in the Webometrics ranking and their use of Twitter. Occupying the highest positions in this ranking implied a higher number of tweets and of Twitter accounts. It was observed that the universities at the top of the ranking used Twitter the most (the correlation of the position was significant for $p < 0.05$, number of profiles 0.204; followers 0.169).

The linear regressions indicated that there was no direct relationship ($p > 0.05$) between the age of the universities and their presence on Twitter. The relationship between the number of students and the number of profiles and followers was significant (p-value = 0.000) (F = 20.005). Their correlation was moderate for all the variables, although there was a greater influence on the relationship between age and the number of accounts (r-Pearson = 0.165), and the relationship between the number of students with the number of followers (r-Pearson = 0.412) and with the tweets (0.147).

It was shown that the oldest universities used Twitter the most and that those with more students had more followers and more tweets. In general, universities followed other users to find out about their topics and tweets. Their presence on Twitter and the communication that was generated with their community was growing, although not in all the universities.

b) Participation of the university community in online conversations via tweets

The mean number of tweets by the universities during the study period was 2,078, according to the number of tweets shown in each of their profiles. This explained how Twitter encouraged the university community to participate in their accounts.

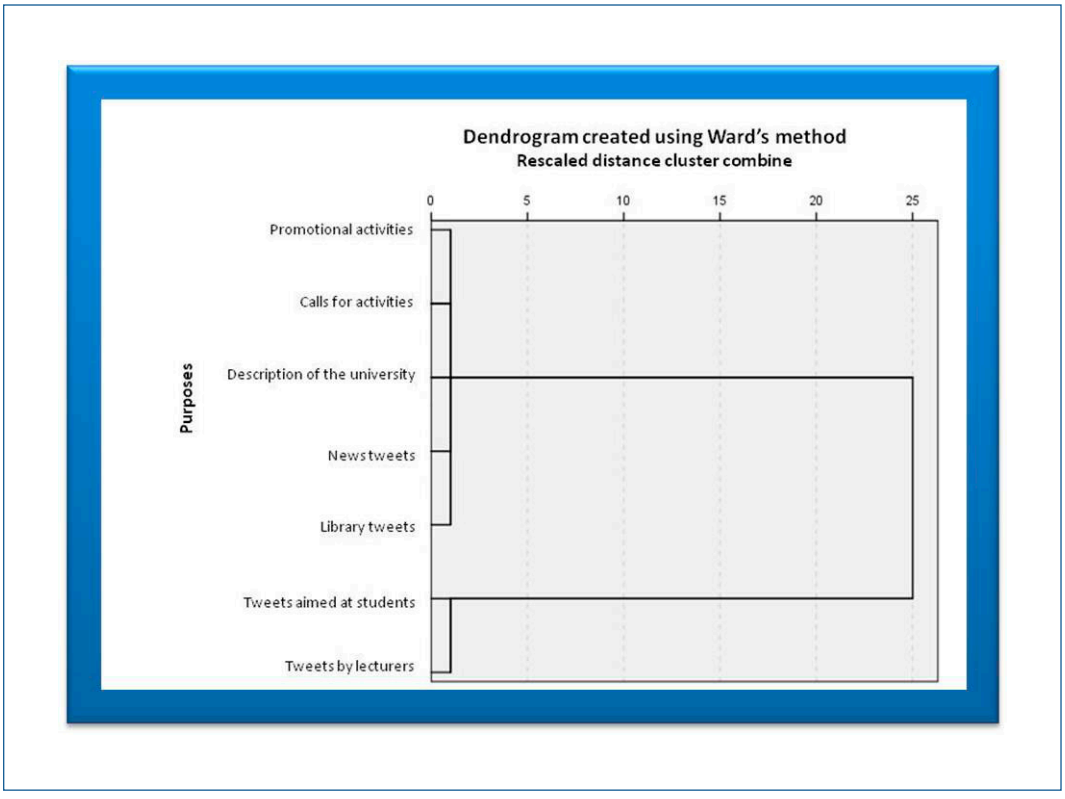

Figure 1. Dendrogram of tweet purposes. Source: Own elaboration

c) Purposes of Twitter use by universities

Twitter was the social network most used by the universities. A mean of 13,104 followers followed the universities' tweets.

An analysis of the hashtags allowed the purposes of Twitter use to be broken down into two main categories (Figure 1).

After grouping together the hashtags tweeted by the university, a cluster analysis was performed on the 231 valid cases using Ward's method to measure the squared Euclidean distance between clusters, and two clusters were obtained that defined two macro purposes:

1. To maintain the brand image of the university: promotion and communication

- Invitations to workshops, forums, etc.
- Calls for activities within the university.
- Topics connected with the library.
- Dissemination of promotional campaigns for services.
- Description of the corporate image of the university.

2. To foster interaction between the university and its educational community

- Tweets aimed at students.
- Dissemination of topics tweeted by lecturers.

4. Discussion

Although this social media tool and its measurements provided sources of reliable data, its usefulness depended on how the universities used it to improve the promotion of their services, by targeting not only the educational community, but also society in general.

Twitter is certainly an alternative means of communication for universities, but it will not be an effective one unless a protocol for operational strategies is created in order to maintain their presence on social networks. Hence, it cannot yet be reliably evaluated as an indicator of quality.

Without doubt, Twitter has considerable advantages, given that it facilitates flexible, entertaining and motivational communication; it enables experiences and opinions to be shared; it changes the educational dynamic by encouraging communication and stimulating the imagination; it arouses interest and fosters discussions and participation (Rinaldo et al., 2011). Likewise, it is seen as the ideal tool for communicating with students (Johnson, 2011).

Universities must adapt to new technologies, since they are the driver of innovation (Casas & Stojanovic, 2013). They also need to have community managers, just like business organisations do; the role such managers play in social networks is key to raising the visibility of their most important research and publications, to promoting their activities and to facilitating the participation of academic community members in a rigorous and professional way.

The competencies of this emerging community manager figure should include: :

- Effectively managing the official profiles of a university.
- Being able to optimise internal and external communication processes, specifically among the

members of a university's own academic community and of others', and even among society as a whole.

- Extending the reach of a university by taking advantage of the activity of its followers, whether researchers, lecturers, students or anyone else.
- Fostering the participation of different members in order to take advantage of the synergies that are generated by information flows and experience sharing for collaborative knowledge construction.

Universities, as institutions that promote the development and knowledge of their communities, should take advantage of the opportunities that social networks offer for minimising the differences between people and promoting equal opportunities for collaborative knowledge creation. Twitter in particular provides universities with a social capital – its followers – that requires special attention and needs new strategies to generate specialised information.

Conclusions

Social networks offer universities a variety of opportunities for disseminating information, communicating and interacting with a diversity of users from the educational community. They also provide universities with effective ways of improving their corporate identities and promoting their services. Many important institutions are working on strengthening their corporate image by actively taking part in Twitter, and some of them have more than one active account for tweeting, which is indicative of the importance being placed on Twitter.

The majority of the universities in the study were located in Spain and Brazil. However, Twitter was actually used most by institutions in Chile, Colombia and Venezuela, as they had the highest number of followers. This demonstrates the enormous potential of Twitter for Latin American universities, if, of course, they use it to optimise their communication strategies.

The analysis of the descriptive indicators of the universities' Twitter accounts highlighted the fact that students usually followed their own universities and that, logically, the universities with the highest number of students had more followers and tweeted the most. Therefore, the universities that tweeted the most were responding to a greater number of followers who were waiting for news to be tweeted via hashtags. In general, the universities followed other users in order to find out about their topics and publications, which consequently generated a multidirectional communication flow.

However, the difference between the mean and standard deviation for most of the variables that were studied showed that Twitter use was not uniform across all the universities. According to the cluster analysis performed by classifying the hashtags they tweeted, this study confirmed that there were two main purposes for their Twitter use: the first was the promotion and consolidation of their corporate image, and the second was communication with members of the educational community.

The corresponding hypothesis tests indicated that neither the age, ownership, nor the student

numbers implied that a university would be more active on Twitter. However, the number of followers that a university had did indeed imply greater Twitter use, which resulted in higher numbers of tweets and retweets being measured.

The fact that the universities had several Twitter accounts was no guarantee of reaching a larger audience. In fact, the crucial factor was knowing how to manage the official account effectively and concentrating all efforts on that task in order to prevent duplicated information and the risk of confusing their followers.

It was confirmed that social networks offered the universities an opportunity for strategic communication so long as they took into consideration the need to have community managers to manage their official accounts, thus enabling those institutions to optimise their communications with their own communities and with their external contexts. This would allow them to extend their reach and take advantage of the coverage offered by existing followers of their accounts – of Twitter in this instance – in order to expand their the field of action and to disseminate the universities' information to an expectant audience.

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