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EDUCATIONAL TECHNOLOGY TRENDS IN THE IBERO-AMERICAN WORLD: 20 YEARS OF THE EDUTEC-E JOURNAL

TENDENCIAS EN EL ÁMBITO DE LA TECNOLOGÍA EDUCATIVA EN IBEROAMÉRICA: 20 AÑOS DE LA REVISTA EDUTEC-E

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ABSTRACT

The paper shows the trends and interest areas within the field of educational technology in the Spanish-speaking world through the qualitative and quantitative software content analysis of the Edutec-e Journal. A total of 320 articles were analysed for themes using its titles and abstracts between the 1995-2015-time period, and its information on their authors and impact in terms of citations. Considering the evolution of the journal, a broader and theoretical perspective on the educational opportunities of technologies is identified in the first period (1995-2004), followed by a more concrete and experimental approach with empirical studies and experiences with the use of ICT in education (2005-2015). Future research lines point towards comparing the results with other Spanish-speaking journals and with educational technology trends in the English-speaking world.

KEYWORDS: Edutec journal, educational technology, content analysis, research trends

RESUMEN

El artículo muestra las tendencias y áreas de interés dentro del ámbito de la tecnología educativa en el mundo hispanohablante mediante software de análisis de contenido cualitativo y cuantitativo de la revista Edutec-e. Se analizaron un total de 320 artículos partiendo de sus títulos y resúmenes durante el período 1995-2015, así como su información respect a los autores e impacto en forma de citas. Considerando la evolución de la revista, se identifica una perspectiva más amplia y teórica sobre las oportunidades educativas de las tecnologías en el primer period (1995-2004), seguida de un enfoque más concreto y experimental con estudios empíricos y experiencias con el uso de las TIC en educación (2005-2015). Las futuras líneas de investigación apuntan a comprar los resultados con otras revistas hispanohablantes y con las tendencias en el área en el mundo anglosajón.

PALABRAS CLAVE: revista Edutec, tecnología educativa, análisis de contenido, tendencias de investigación

1. INTRODUCTION

The area of Educational Technology launched its foray in Spain in 1970 with the General Law of Education and the creation of the Institute of Educational Sciences for In-service Teacher Training. In the 1980 different educational programs oriented towards incorporating computers to the school system initiated by the Ministry of Education and by the different autonomous communities gave a boost to the area (Area, n/d).

Shortly after, in 1993, two university groups of interest in Educational Technology were established in Spain, concurring with the beginning of two Educational Technology conferences in the country (González-Soto, 2008). One of these groups of interest was EDUTEC, which from the beginning expanded its coverage to Portugal and Latin-American countries. The Spanish Association for the Development of the Educational Technology and New Technologies applied to Education (EDUTEC) (http://www.edutec.es/) was born as an educational professionals association with the main aims of promoting cooperation for the production, diffusion, use and evaluation of educational materials and programs; helping in the experimentation and research of the members in the application of technologies to education; and promoting the educational experience in the area, offering counseling among members. As part of its activities, EDUTEC publishes the Edutec-e, Electronical Journal of Educational Technology since 1995. As the association is, this journal is one of the most established and known journal in Educational Technology in the Spanish- and Portuguese-speaking countries and has been from its beginning an open access and free subscription journal. Today, both EDUTEC and its journal Edutec-e are well-recognised in the Educational Technology area in the Spanish-speaking world, although outside the Ibero American countries and, more concretely, in the English-speaking world, they are not that visible.

Therefore, with the aim of exploring Spanish-speaking world of research in Educational Technology and to make it known in a more broadly context, the aim of this article is to report on the 15 years of publications (1995-2015) in the Edutec-e, Electronical Journal of Educational Technology. To explore the key themes covered in the publications over this period and the semantic relationships among these themes the text mining tool LeximancerTM was used. LeximancerTM is a software tool that has already been proved to be helpful for this kind of task, concretely it has been used before to analyse another Educational Technology related academic journal -Distance Education-, but also other academic journals (the Journal of Cross-Cultural Psychology, Journal of International Business Studies or the Journal of Communication) (Zawacki-Richter & Naidu, 2016). Other more quantitative aspects (citations, more published authors and so on) were explored through the Publish or Perish software, which is centred on retrieving and analyzing academic citations, especially from journals not listed on ISI and in a language other than English based on Google Scholar data (Harzing, 2007).

Even if Edutec is also an Educational Technology related academic journal, as is another analysed before with Leximancer (see Distance Education), it covers the Spanish-speaking world of research in the area and aims to give an insight on the research trends and topics in this context. Moreover, this study is in line with another previous descriptive work on the evolution of the EDUTEC community through the analysis of its distribution list and journal (Salinas, 2008), which used as methods the characteristics of the members of the distribution list (number, country), the Google search results for the number of article results and the number of visits to them.

2. A BIT OF HISTORY OF THE EDUTEC-E JOURNAL

In the origins of Edutec-e the journal was distributed via the discussion list edutec-l (edutec-l@listserv.rediris.es) and web, including one single full paper, with the objective of creating debate on topics for the new generated community around educational technology in Ibero American countries, and had a clear idea to create a journal in the future -it had ISBN since its beginning. These early stages, the articles were published by invitation, so not a peer-review was conducted until 2000. At this point there was only the director and the secretary for the journal, both with a background in education and experience in the Spanish school and university, in the area of educational technology, and always from the pedagogical perspective.

The main objectives of the Edutec-e journal were and still are to spread research works and experiences from the professional environment in the Educational Technology area, and to work as a platform for dialog, ideas exchange and participation in the discussion list edutec-l.

The first issue was published in 1995, and until 1999 there was only one full article for each issue. From 2000 the frequency of publication changed to 4 issues regularly each year (quarterly), moved exclusively to web format (HTML) and established its review policy (peer-review). Along these changes, the scientific and review committee were added to the

journal, and were composed by relevant experts in the area of educational technology at an international level, all of them teachers of Ibero American universities (Spain, Portugal, Argentina, Colombia, Brasil, Venezuela, Cuba, Costa Rica, Bolivia, Ecuador,...).

Until 2015, Edutec-e was hosted in RedIris -the Spanish academic and research network funded by the Ministry of Economy and Competitiveness that provides communication support to the scientific community and national universities. Recently, in the same year, the journal moved to Open Journal Systems, as one of the requirements of Spanish seal of quality for journals of the Spanish Foundation for Science and Technology (FECYT).

From 2008 the journal has published some years a special issue related to the current trends or as anniversary of a topic, namely:

- 2014-Issue 47- New learning scenarios
- 2015-Issue 52- Webquest: 20 years using Internet as classroom resource
- 2008-Issue 25- Edutec: 12 years are nothing

The history of Edutec-e journal cannot be understood without considering the larger context of work of dissemination and exchange of ideas on the Internet sponsored by the EDUTEC Association, which also includes a yearly international conference on Educational Technology from 1993 in an Ibero American location (Salinas, 2008). Therefore, the Edutec-e Journal is part of a broader initiative - a Virtual Community of Educational Technology, promoted and designed by the EDUTEC Association-, which includes i.e., apart from the journal and the conferences, the discussion list as a discussion forum and professional exchange (Edutec-l), a shared space on BSCW for interuniversity work groups, a chat room, the Edutec blog or an international research panel in educational technology.

According to the scope of the journal, Edutec-e publishes research results, studies, experiments, essays and reviews related to educational technology, didactic media and resources, mass media, and learning and teaching processes with information and communication technologies (ICT). Currently the Edutec-e journal accepts four kinds of papers, which are:

- Reports of research projects.
- Innovation experiments, which are evaluated and proven that can be transferred to other contexts or situations.
- Essays and systematic theoretical reviews.
- Reviews of recent published works in the area.

The review process begins with an internal revision, in which the editorial committee values the suitability of the work according to the themes of the journal, and then the process continues with external reviewers and using quality criteria from the FECYT.

3. METHODS AND SAMPLE

The analysis of the journal was both quantitative and qualitative and included the collection of the abstracts, titles, authors, countries, affiliations, most published authors and most cited papers.

The research question was, namely: Which have been the trends and topics in Educational Technology in the Ibero American world?

The method used is content analysis, which enables us to find out about this specific phenomenon besides of what can be observed or sensed (Krippendorff, 2013).

Content analysis

The content analysis method fits well with the previously stated purpose, since it is a research technique for making replicable and valid inferences from large volumes of data to the contexts of their use (Krippendorff, 2013, p. 18). Therefore, content analysis is characterised by being able to reduce data and being systematic and flexible (Schreier, 2014). As the same author points out, these features of qualitative content analysis entail other actions as well. For instance, reducing data means to loss concrete information but, at the same time, involves an increased sense of connection and relation between different parts of the data. By being systematic, it refers to the requirement of following a certain sequence of steps and the involvement of some coding and double coding, and the coding frame is flexible in the sense that is always matched to the material (Schreier, 2014).

By using automated content analysis software or text mining tool, such as Leximancer (2016), the subjectivity that may arise in manual methods by applying the technique is mitigated and the time and economic efforts that would imply to carry out the systematization and reduction of data are considerably lessened.

Even if there are notable advantages of using this software, as highlighted by Harwood, Gapp and Stewart (2015, p. 1041), they also point out that “Leximancer is not a panacea”, it requires the understanding and knowledge of the subject matter to make sense of and interpret the concept maps (Zawacki-Richter & Naidu, 2016).

Procedures

For the qualitative analysis of the emerging themes, the abstract and titles of the articles of the journal were analysed using the Leximancer software. The result of this qualitative analysis with Leximancer is a set of concept maps, where the concept frequency, the hierarchical order of appearance and the proximity among concepts are visualised (Smith & Humphreys, 2006). Each thematic region is formed based on the connectedness of concepts and highlighted by the most relevant concept in terms of frequency and connections (relational analysis).

In the case of the first issues of Edutec-e, some abstracts were missing, so in most cases the introduction section was used as their abstract or, in case there was no introduction, some parts of the article that were representative for the full article were used as abstracts.

Even if the Spanish option is among the possibilities of the files to include, the system was not able to correctly retrieve the accent marks and the Spanish consonant "ñ", so all of them were replaced with vocals without accent marks and the consonant "n", respectively. During the analysis, some common and frequent words that were not related to the article topics were deleted, as for example, "through" (través) or "article" (artículo). Some others were merged because they have the same meaning but the words took different forms, for instance, "teachers" ("profesorado" and "profesores"). On the other hand, the Edutec-e journal accepts Portuguese articles as well, as it is based on Ibero American countries. However, by far only two articles were published in Portuguese and were not included in the analysis. Most of the Portuguese and Brazilian authors published their works in Spanish.

Another difficulty was related to the periods of analysis of the journal. At first, 5-year periods were considered for the analysis but, since the first issues have so few articles, the suitability of the analysis was compromised. Therefore, a 10-year periods analysis was reconsidered.

The quantitative analysis is based on descriptive statistics for the distribution of papers according to the authors' affiliations, countries and genre. Besides, paper citations were revised using the Publish or Perish software (Harzing, 2007) that gives information, among other aspects, on the total number of papers and total number of citations and the average citations per paper, citations per author, papers per author, and citations per year. This information is useful to combine with the qualitative data and gives more insight on the popular topics and leaders in the field.

Sample

For this study, all articles published in EDUTEC between 1995 and 2015 were reviewed (n=320), whose contributors were 154 (48.1%) men and 166 (51.9%) women. Book reviews and editorial notes were excluded from the sample.

The articles were analysed and two subsets of data were created: 1995-2004 (n=49) and 2005-2015 (n=271).

Year	No. of issues	No. of articles		Year	No. of issues	No. of articles
1995	1	1		2006	3	20
1996	4	4		2007	2	12
1997	3	3		2008	3	20
1998	2	2		2009	3	22
1999	1	1		2010	4	25
2000	3	10		2011	4	36
2001	1	3		2012	4	36
2002	1	8		2013	4	36

2003	4	4		2014	4	30
2004	2	12		2015	4	30
2005	1	5				
Total						320

Table 1: Number of articles per year published in Edutec

The articles came from 14 different countries, but the majority from Spain (69.4%), where the journal took its roots. Latin-American countries count for almost all the remaining percentage (28.1%), with more presence of Argentina (9%) and Mexico (7.5%).

Country*	**Total**	**%**	**Cum. %**	**Country**	**Total**	**%**	**Cum. %**
Spain	222	69.4	69.4	Brazil	3	0.9	97.5
Argentina	29	9.0	78.4	United States	3	0.9	98.4
Mexico	24	7.5	85.9	Canada	1	0.3	98.8
Cuba	15	4.7	90.6	Dominican Republic	1	0.3	99.1
Venezuela	8	2.5	93.1	Ecuador	1	0.3	99.4
Chile	6	1.9	95.0	El Salvador	1	0.3	99.7
Colombia	5	1.6	96.6	France	1	0.3	100.0

Table 2: Countries of origin of the first authors.

Concerning the impact of the journal, the 5 top cited articles are highlighted below. More detail on the 10 top cited articles and the most cited articles for each year of publication can be found enclosed in Annex 1.

Cita-tions	**Author(s)**	**Title**	**Year**
1172	Adell	Tendencias en educación en la sociedad de las tecnologías de la información	1997
660	Cabero	Nuevas tecnologías, comunicación y educación	1996
342	Adell	Internet en el aula: las WebQuest	2004
295	Salinas	Enseñanza flexible, aprendizaje abierto. Las redes como herramienta para la formación	1999
204	Bartolomé	Preparando para un nuevo modo de conocer	1996

Table 3: Most cited articles from years 1995-2015 for EDUTEC.

The total number of different authors who contributed to the 320 articles in this study was 550. The 28 authors who contributed to at least three articles are from Spain (n=17), Argentina (n=5), Mexico (n=3), Brazil (n=1) and Chile (n=1).

The total number of different affiliations of the first author is 132. There were 32 affiliations who contributed at least three articles. The top 5 are Universidad de Murcia (Spain) (n=20), Universidad de Sevilla (Spain) (n=19), Universitat de les Illes Balears (Spain) (n=19), Universidad de las Ciencias Informáticas (Cuba) (n=8) and Universidad de Huelva (n=7).

4. RESULTS AND DISCUSSION

Overall scope of the journal

The central theme covered in the publication is “learning” (1020 hits) and teaching (enseñanza) with educational technologies. “Learning” (aprendizaje) is connected with “virtual” (virtual) and “design” (diseño) via “process” (proceso) and with “new technologies (nuevas tecnologías) via “education” (educación) and “educational” “resources” (recursos educativos). As learning is a social exercise, “communication” (comunicación) (253 hits) is a major thematic region that overlaps with “learning” via “new technologies”. As many of the articles from the journal report empirical results of educational studies, the second emergent theme is “results” (resultados) (593 hits), which overlaps with “learning” through “research” (investigación). Finally, the theme “evaluation” (evaluación) (132 hits) is connected to “learning” via “process” (proceso) and “quality” (calidad).

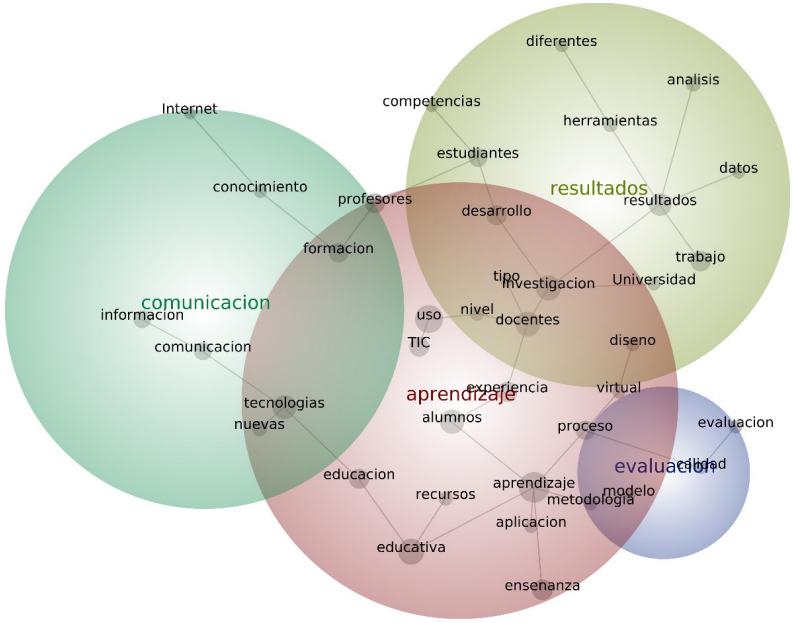

Figure 1. Main themes of Edutec Journal.

According to this initial overview of the themes and topics of the Edutec-e journal between 1995 and 2015, we will proceed to analyse each period in more detail.

The beginnings of the Edutec-e journal (1995-2004): Reflections on the educational opportunities of technologies. In this first phase, "technologies" (tecnologías) are the main theme (283 hits) and overlaps with "training" (formación) (86 hits) via "learning" (aprendizaje). This was the period for the mainstream arrival of multimedia, computers and Internet in Spain, alongside with the respective reflections on their risks and possibilities for learning and teaching, education, society...as well to new policies and models for the use of technologies, which led to some degree of discussion. The last emergent theme in this period is "levels" (niveles) (47 hits) and comes apart from the other two and connected to "technologies" via "teachers" (profesores).

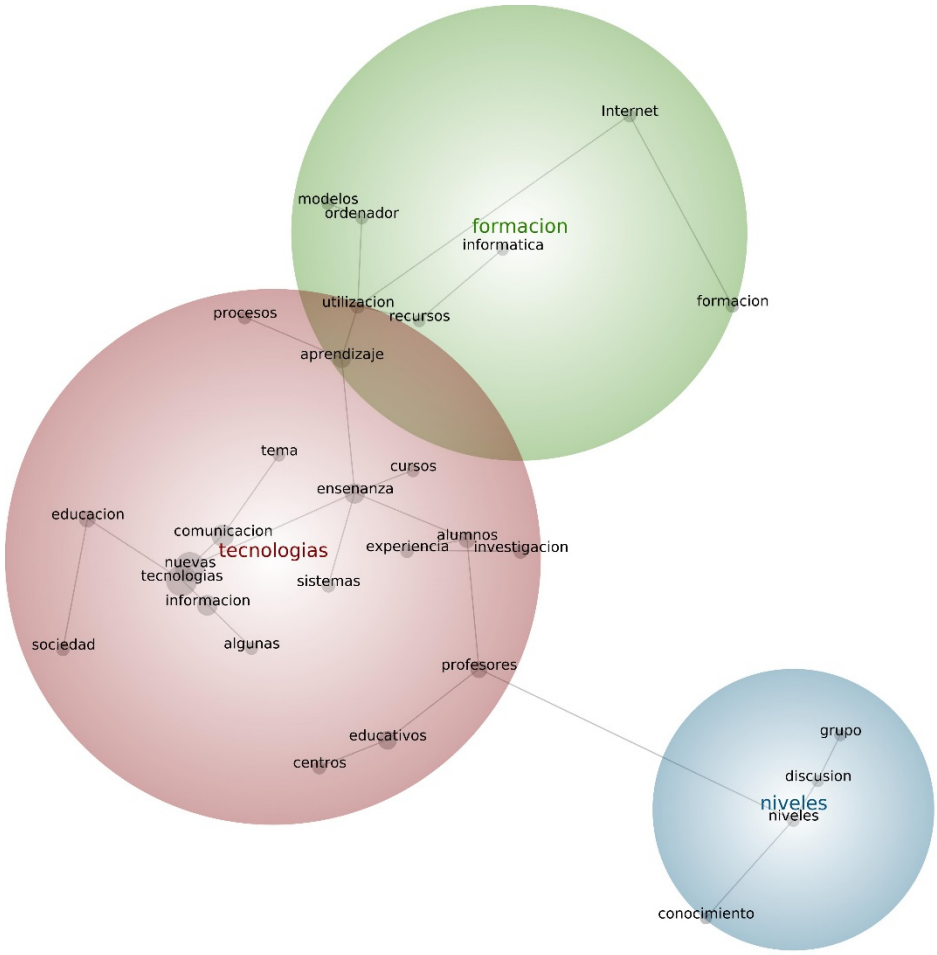

Figure 2. Themes in the Edutec-e journal between 1995 and 2004.

Researchers around that time focus on theoretical and critical reflections on the educational possibilities of "new technologies" (nuevas tecnologías), and how to use them as "resources" (recursos) for training, such "computers" (ordenadores) (León Montoya, 2003) or Internet (de Benito, 2000; Fernández Hermana, 2004; Salinas, 1999), both connected to "learning" via "use" (utilización); the "communication" (comunicación) technologies, which

is connected to new technologies via "teaching" (enseñanza), e.g. forums (Brito, 2004), videoconferencing (Silva, 2004), discussion groups (Espinosa, 2000) or email (Pérez Garcias, 1996). As technological resource, Webquest seemed to be quite popular from 2000 (Adell, 2003; 2004) although it does not appear in the concept map. Other new technologies with educational potential highlighted during these period by some authors are the television (Prendes, 1997; Salinas, 1995); videogames (Gros, 2000; Sedeño, 2002; Urbina, 2002).

Other relevant topic, which is as well present, is the new competences that technologies and resources entail for students and teachers and the importance of teacher training in this area (Cabero, 2004; Cabero, Duarte & Barroso, 1999; Cebrian, 1997). This can be observed from the connection of "new technologies" to "education" (educación) on one side, and from the other to "students" (alumnos), "teachers" (profesores), "teaching" and learning, to the training theme. "Levels" of "knowledge" (conocimiento) are connected to the technologies theme via "teachers", and "levels" of "discussion" (discusión) are also required to reflect on how teachers could integrate technologies in the "schools" (centros educativos) and, on general, to their "teaching" with "students". Nevertheless, only a few educational experiences, mostly related to research/innovation projects (Gisbert, Henríquez & Rallo, 2000). Both words, "research" (investigación) and "experiment" (experiencia) are connected to "students" (alumnos), "teachers" (profesores) and "teaching" in the technologies theme.

Even if most of them are general reflections, of value for the "society" (sociedad) as a whole, major focus is placed on "schools", followed by university contexts related to "courses". There are some few works that are centred on the early childhood education (e.g. considerations for educational software for this educational level in Urbina, 2000) and the special needs education (e.g. considerations on the difficulties to integrate technologies in Special Education in Negre, 1998).

Besides this, between 2000 and 2004 distance education as a university education mode of delivery or teaching systems for courses seems to gain importance and some works describe the experiences of the Athabasca University in Canada (Cookson, 2001), the UNED (García Aretio, 2001) and the UOC (Pagés, 2001) in Spain, the CUAO in Colombia (Segura, 2004), or reflections around the e-learning and distance education model (Barron, 2004; Cardona, 2002; Sangrà, 2002). These are reflected through the connection among the concepts "systems" (sistemas), "teaching" (enseñanza) and "courses" (cursos) within the theme "technologies".

From 2000, and concurring with the change on the publication frequency, the number of papers centred on some study or experiment in a course increased, although reflection papers, each time more focused on practical issues for application (i.e. applicable legislation, specific geographic contexts...), are still more present in the issues during this period. This is also coherent with the change of policy of the journal regarding the types of articles accepted from 2000 onwards.

Consolidation of the Edutec-e journal (2005-2015): Empirical educational studies and experiences with ICT. In this next phase, the focus of the journal papers has already moved to two big overlapping themes: "learning" and "results" connected via "research" (investigación) (78 hits). The theme "learning" is especially rich with concepts related to "education", which is relevant after the first period in which "technologies" were the most

frequent theme. The learning theme connects to "training" via "technologies" and "education", to "students" (150 hits) via "development" (desarrollo) (64 hits) and "teachers" (132 hits), and to "evaluation" via "students".

After the first period of fascination of the opportunities that educational technology affords for teaching and learning, empirical educational studies in which the focus is set on the students and teachers follow.

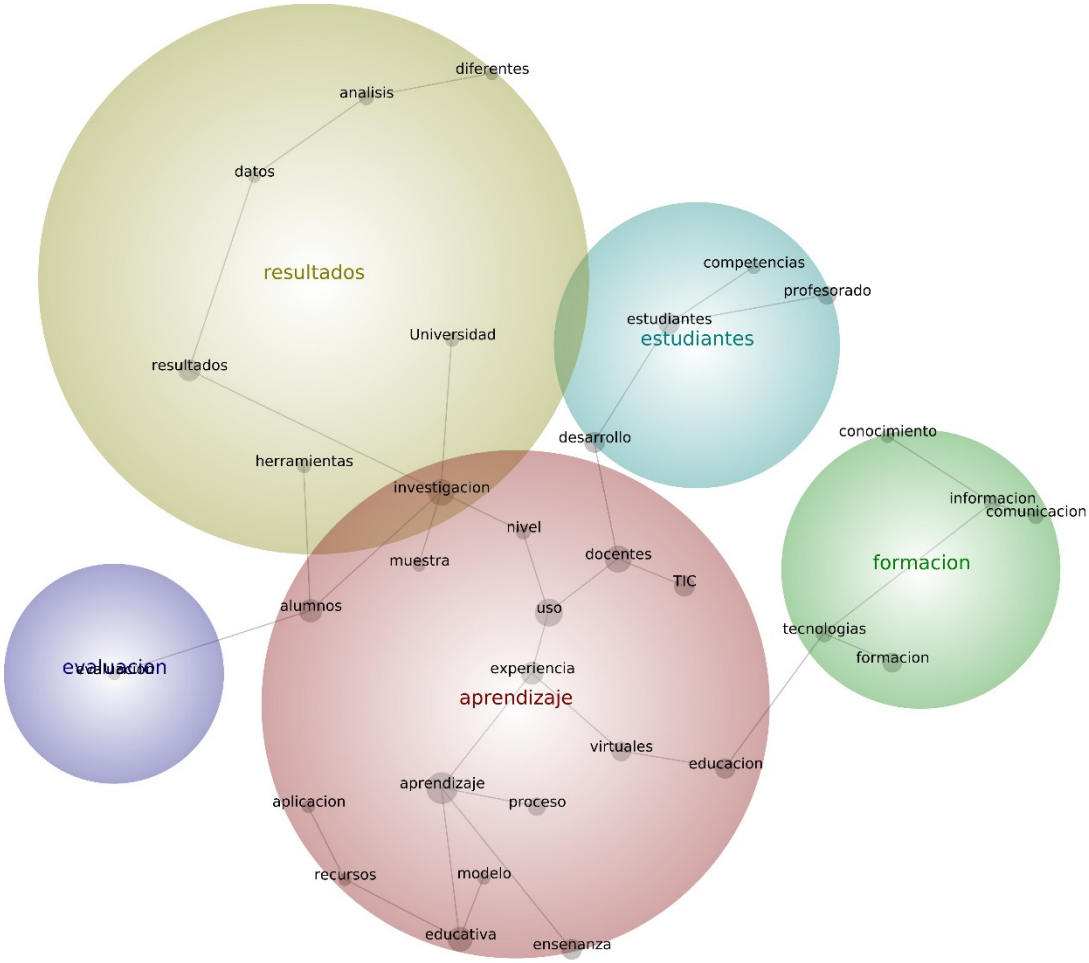

Figure 3. Themes in the Edutec-e journal between 2005 and 2015.

Within the learning theme, Information and Communication Technologies (TIC) as concept is connected to "learning" and "process" (proceso) via "teachers", "use" (uso) and "experiment" (experiencia). Therefore, in this period, ICT, and especially Web 2.0 tools (Aguaded & Fandos, 2008; de la Torre, 2006), are used in different educational experiments to enhance the learning processes.

Likewise, concepts such as "teaching" (enseñanza), "educational" (educativo/s), "resources" (recursos) and "application" (aplicación) are connected to "learning" and "process". Here it

is a relevant topic the development and application in an educational context of new educational multimedia resources (Armenteros, Benítez & Curca, 2010) and open educational resources (Guzmán & Vila, 2011).

Regarding educational resources or technologies for training, other tools that started to be studied in the previous period remain important topics, e.g. videogames (Pérez Martín & Ruiz, 2006; Sánchez Rodríguez, Alfageme & Serrano, 2011), communication technologies as forums (Aveleyra & Chiabrando, 2009), television in the form of cinema (Marín Díaz, González López & Cabero, 2009) or the webquest (del Campo & Parte, 2011; Domínguez et al., 2015; Rodera, 2008).

Other new technologies and resources emerge as educational technology enhanced opportunities for learning and teaching, in most cases, as part of the Web 2.0 possibilities for interaction in information and communication, such as concept maps (de Benito, Darder & Salinas, 2012; Castilho, 2005), blogs or weblogs (Amorós, 2007; Bohórquez, 2008; Ferreyro, 2007; Salinas & Viticcioli, 2008; Santoveña, 2011; Torres, 2009), virtual environments (Granda, 2010; Mariño, Litwak & Caulin, 2008; Núñez, 2011), social networks (Cascales, Real & Marcos, 2011; Sotomayor, 2010), virtual worlds (Revuelta, 2011), microblogs (Fandos & Silvestre, 2011), e-portfolios (Gallego, Cacheiro, Martín & Angel, 2009), wikis and Google Drive (from 2014, e. g. Brescó & Verdú, 2014). From 2011 educational use with smartphones is reported (Organista-Sandoval & Serrano-Santoyo, 2011), followed by studies on MOOCs are observed from 2014 (Sánchez Acosta & Escribano, 2014) and with tablets from 2015.

Following the line of the previous period, other educational models (modelo educativo) as modes of delivery for learning emerged as the virtual communities model (Cabero, 2006; Cabero & Llorente, 2010; Prendes & Solano, 2008) or the personal learning environments (Cabero, Marín Díaz & Infante, 2011; Gallego-Arrufat & Chaves-Barboza, 2014). “Virtual education” (educación virtual) is still present within the theme, and connected to “training” (formación) and “technologies” (tecnologías) (training theme).

The second major theme is results (resultados), which overlaps with “learning” via “research” (investigación). This theme refers to the results in form of “data” (datos) or “analysis” (análisis), depending on the methodological approach (quantitative, qualitative or mixed), derived from the application of educational “experiments” (experiencias) with ICT (TIC) “tools” (herramientas) with a “sample” (muestra) of “students” (alumnos), often at the University (Universidad) level, even though in this period the educational contexts in which ICT are used are more diversified (vocational training, high schools, in-company training, discapacity, non-formal learning…) and in diverse subject areas (mathematics, language learning, music…).

Teacher training in ICT use for education and the topic of digital competences in different educational contexts (schools, university) and moments (pre-service, in-service) is also a topic that continues from the first period, but now it is presented with further depth, and appears in the “students” (estudiantes) theme. “Competences” (competencias) are connected to “development” (desarrollo) via “students” (estudiantes) and “teachers” (profesorado, docentes), and to “ICT” (TIC) within the learning theme. On the other hand, within the “training” (formación) theme, “information” (información), “communication” (comunicación) and “knowledge” (conocimiento), which are key words related to ICT and

the current learning society, are connected to "training" (formación) and "education" (educación) via "technologies" (tecnologías).

Here, for instance, the development of an instrument to evaluate students' digital competences (Carrera, Vaquero & Balsells, 2011), the evaluation of the students' digital competences or their perceptions (Cabezas, Casillas, Pinto, 2014; Brazo, Ipiña & Zuberogoitia, 2011), the definition of teachers' digital competences (Gallardo, Marqués & Gisbert, 2011; Marín Díaz et al., 2012) and the evaluation of future teachers' digital competences (Gallego, Gámiz & Gutiérrez, 2010) can be found.

Related to "evaluation" (evaluación), different proposals of instruments/indicators to assess diverse aspects, most of them validated, are presented. The major topic within this theme is the evaluation of ICT-enhanced courses by the students so as to ensure quality (this concept as a concern appears in the overall concept map), and that they are effective for learning. For instance, the students' satisfaction with the courses (Alonso, 2010; Barroso & Cabero, 2010; García-Valcárcel & Basilotta, 2015), the students' attitudes and knowledge towards ICT (Amorós, 2011), the students' perceptions of the usefulness of ICT resources (García-Barrera, 2015) or the students' evaluation of didactic resources (Mirete, García-Sánchez & Sánchez-López, 2011).

On the other hand, the teachers' evaluation of ICT-based courses is also present (Cabero & López Meneses, 2009; García López & Cabero, 2011), as well as their attitudes towards the integration of ICT in courses (Álvarez et al., 2011) and their formative needs of virtual tutors (Rodríguez Fernández, 2014). Some studies consider both the evaluation perspectives from the teachers and the students (Flores & del Arco, 2011).

Some other series of indicators created are, for instance, oriented towards designing and evaluating the cooperative learning in virtual courses (Casanova, Alvarez Valdivia & Gómez Alemany, 2009) or systematising the educational technology research (Cabero et al., 2009). Within this theme, the concept of usability of websites, courses and resources appears (García Martínez, Torneno & Sierra, 2011; González Ricardo, Acosta & Moyares, 2010), even if it does not stand out on the visual concept map.

5. CONCLUSIONS

The quantitative and qualitative analysis conducted in this work aimed at identifying the trends and topics of the field of Educational Technology in the Spanish-speaking work through the articles published on the Edutec-e journal between 1995 and 2015.

The emergent themes are coherent with the current article types that the Edutec-e journal welcomes, which are, mainly, reports on research projects and innovation experiences using ICT for education, analysis of technological tools and resources applied to learning and teaching and systematic literature reviews. In addition, from the analysis, a broader and theoretical perspective is identified in the first period (1995-2004), followed by a more concrete and experimental approach that emerges from empirical studies on the use of ICT in education.

Future research work in this line will focus on the content analysis or other well-recognized Educational Technology related academic journals in the Spanish-speaking world in the same period (e.g., Pixel-Bit, RUSC, Comunicar, ADIE), which will give insights on a broader perspective of the trends in the Educational Technology research area for Spanish-speakers and will enable us to find out how much these trends differ from the ones identified in Educational Technology academic journals in other contexts, such as the English-speaking world.

6. REFERENCES

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Annex 1 - Most cited articles from years 1995-2015 for EDUTEC

Cita-tions	Author(s)	Title	Year
5	García-Valcárcel & Basilotta	Evaluación de una experiencia de aprendizaje colaborativo con TIC desarrollada en un centro de Educación Primaria	2015
12	Roig & Flores	Conocimiento tecnológico, pedagógico y disciplinario del profesorado: el caso de un centro educativo inteligente	2014
21	Álvarez & López	Análisis del uso de Facebook en el ámbito universitario desde la perspectiva del Aprendizaje colaborativo a través de la computadora	2013
20	Morán	Blended-learning: Desafío y oportunidad para la educación actual.	2012
63	Cabero, Marín Díaz & Infante	Creación de un entorno personal para el aprendizaje: desarrollo de una experiencia	2011
60	Gallego, Gámiz & Gutiérrez	El futuro docente ante las competencias en el uso de las tecnologías de la información y comunicación para enseñar	2010
187	Ferro, Martínez & Otero	Ventajas del uso de las TICs en el proceso de enseñanza-aprendizaje desde la óptica de los docentes universitarios españoles	2009
78	Bohórquez	El blog como recurso educativo	2008
29	Barroso Ramos	La incidencia de las TICs en el fortalecimiento de hábitos y competencias para el estudio	2007
167	De la Torre	Web Educativa 2.0	2006
167	Cabero	Comunidades virtuales para el aprendizaje. Su utilización en la enseñanza	2006
26	Villarreal	La Resolución de Problemas en Matemáticas y el uso de las TIC: Resultados de un estudio en Colegios de Chile	2005
342	Adell	Internet en el aula: las WebQuest	2004
116	Adell	Internet en el aula: a la caza del tesoro Edutec	2003
124	Sangrà	Educación a distancia, educación presencial y usos de la tecnología: una	2002

		tríada para el progreso educativo	
119	Cardona	Tendencias educativas para el siglo XXI: Educación virtual, Online y @learning. Elementos para la discusión	2002
11	García Aretio	La innovación permanente en la UNED: del material impreso a la tecnología UMTS	2001
102	de Benito	Herramientas para la creación, distribución y gestión de cursos a través de Internet	2000
295	Salinas	Enseñanza flexible, aprendizaje abierto. Las redes como herramienta para la formación	1999
95	Cabero, Duarte & Barroso	La piedra angular para la incorporación de los medios audiovisuales, informáticos y nuevas tecnologías en los contextos educativos: la formación y el perfeccionamiento del profesorado	1998
1172	Adell	Tendencias en educación en la sociedad de las tecnologías de la información	1997
660	Cabero	Nuevas tecnologías, comunicación y educación	1996
204	Bartolomé	Preparando para un nuevo modo de conocer	1996
4	Salinas	Satélites, cable, redes: Un nuevo panorama para la producción de televisión educativa	1995