

Meta-analysis of the Articles Published in SPDECE and its Comparison with IJELLO

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Abstract

The Spanish Multidisciplinary Symposium on Design and Evaluation of Reusable Educational Content (a.k.a. SPDECE) is an annual meeting of researchers and teachers organized by the Spanish Thematic Network of Activities and Objects for Learning (a.k.a. REDAOPA). The objective of SPDECE is to share experiences and results of research being carried out, in both pedagogical and technological fields, on the design, development, and best practices in reusable learning objects. In addition, it also aims to establish linkages and synergies between the individuals and organizations attending the conference. This work tries to determine the level of attainment of those objectives based on the analysis of the topics, organizations, authors, and citations of the articles published in SPDECE through its various editions. In addition, topic and organization structure comparison between SPDECE and the reference journal in the field of learning objects IJELLO (Interdisciplinary Journal of E-Learning and Learning Objects) is presented.

Keywords: learning objects, social network analysis, Pajek, REDAOPA, SPDECE, IJELLO

Introduction

In recent years it has become clear, from a pedagogical point of view, that it is necessary to identify which models of teaching and learning are the most appropriate and effective to design and implement ICT-based educational proposals for the development of experiences oriented to the construction of knowledge. This scenario raises, from a technological point of view, new challenges for the design of digital learning resources, especially for those required to be open, flexible, and reusable in different learning contexts.

The learning object is a concept that tries to provide answers to those pedagogical and technological questions that stem from the design of reusable educational contents. A learning object is

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defined as educational content that can be used in technology-enhanced learning. Learning objects are described with metadata supported by different standards that enable interoperability and reusability in different applications and environments. Thus, learning objects can be used as modules of varying granularity that can be assembled one with another in order to form lessons

and courses of various kinds (McGreal, 2004).

Many different approaches deal with learning objects. Some of them focus on learning objects as reusable elements, whereas others focus on providing the needed infrastructure (Zimmermann, Meyer, Rensing & Steinmetz, 2007). However, despite the research efforts in this area (Sicilia & Sánchez-Alonso, 2005), the concept of learning object does not have a reference framework mature enough to consider it as a definite improvement to ICT-based processes of teaching and learning (Guàrdia & Minguillón, 2005). Because of its implications for educational organizations, the scientific community has to face this complex and multidisciplinary issue that has been shown to suffer from implementation limitations.

Spanish Multidisciplinary Symposium on Design and Evaluation of Reusable Educational Content

In this context arises Spanish Thematic Network of Activities and Objects for Learning (a.k.a. REDAOPA) with the objective of promoting research in the field of learning objects and encouraging the use of best practices through them in educational organizations.

It is difficult for researchers to be conversant with all the branches of knowledge within which they carry out their research. Multidisciplinary participation provides an advantage because of the expanded focus and global vision that can be achieved. This is the reason why REDAOPA (<http://www.cc.uah.es/ie/projects/redaopa>) was established as an open network made up of researchers and teachers who range from Computer Science to Educational Science fields.

Among the various activities being carried out by REDAOPA, the organization of Spanish Multidisciplinary Symposium on Design and Evaluation of Reusable Educational Content (a.k.a. SPDECE) can be highlighted, of which five editions have been published to date:

- 2004, in Guadalajara, organized by the University of Alcalá de Henares (<http://www.cc.uah.es/spdece>)
- 2005, in Barcelona, organized by the University of Catalonia (<http://www.uoc.edu/symposia/spdece05>)
- 2006, in Oviedo, organized by the University of Oviedo (<http://www.spi.uniovi.es/od@06>)
- 2007, in Bilbao, organized by the University of the Basque Country (<http://spdece07.ehu.es>)
- 2008, in Salamanca, organized by the Pontifical University of Salamanca (<http://www.upsa.es/spdece08>)

SPDECE is one of the major meetings on learning objects that take place in Spain, and attendance has become mandatory for those who want to be aware of everything related to learning objects.

The objectives of the conference are the following:

- To bring together specialists from different disciplines and to set up a network of contacts in the field of learning objects that strengthens synergies between its members.
- To encourage the discussion and exchange of ideas for current developments and future trends, about learning objects, that ranged from technical to educational level.
- To disseminate new results of recent research that helps to identify the best design and development patterns in reusable learning objects and the repositories that contain them.

- To share experiences and best practices that can be used as a reference for progressing in the practical aspect and, consequently, for continuing research in this area.

This paper aims to verify whether SPDECE, along with its various editions, has succeeded in the objectives set out above. To that end, a meta-analysis of the articles published in the conference along its various editions has been conducted. This meta-analysis has focused on the following key points: lines of work and their relationships, working groups and collaboration between them, and the balance between the two main topic areas (technological and pedagogical).

In addition, SPDECE topic and organization structure is compared with that of an international journal in the area of learning objects. IJELLO (Interdisciplinary Journal of E-Learning and Learning Objects, <http://ijello.org>) is the journal we have chosen, as it can be considered a worldwide frame of reference for the publication of theory, practice, innovation, developments, and research related to reusable educational content and its application to technology-enhanced learning.

The rest of the paper is laid out as follows: first, the objective of the meta-analysis is described in detail in terms of the questions that are intended to be answered; secondly, the procedure used for answering those questions, based on the analysis of social networks, is outlined; thirdly, the results of the meta-analysis are shown; finally, those results are discussed and conclusions are presented, together with some recommendations that can guide to perform this work on an ongoing basis in the future.

Objectives

We are interested in knowing the significance of the impact and changes in the topics, organizations, and individuals that have made up SPDECE throughout time. Therefore, certain questions were established in order to focus the meta-analysis and to identify the indicators and parameters that were to be measured in it:

- Which topics are covered in SPDECE? How have they evolved over the years? What are the relations between them? The weight of each topic; the representation of the resulting network of topics; the identification of topics that act as core nodes and those which act as gateway nodes; and the link between the two main topic areas: technological and pedagogical.
- What organizations are involved in SPDECE? How does the conference contribute to the establishment of relationships between the different organizations involved in it? The weight of each organization; the representation of the resulting network of organizations; the identification of organizations that act as core nodes and those which act as gateway nodes.
- The topic areas the members of the scientific committees belong to. Does the technological or pedagogical origin of the scientific committee members of the conference have a noticeable influence on the selection of articles related to a particular topic area?
- Who are the authors that exert more influence over conference contributors? The most referenced authors and articles.
- What is the participation level of REDAOPA members in SPDECE? The contribution of REDAOPA members, pointing out if it is developed in a sustained manner throughout time.
- What is the situation of SPDECE worldwide? Compared to IJELLO, the weight of each topic; the representation of the resulting network of topics; the identification of topics

that act as core nodes and those which act as gateway nodes; and the link between the two main topic areas: technological and pedagogical.

Procedure: Social Network Analysis

Research individuals and organizations communicating, working and exchanging information on a specific topic, tend to form social networks called *invisible colleges* in which the activities between members take place through nodes of high productivity (Crane, 1972). Invisible colleges emerge and evolve when people who have common goals interact to share knowledge.

People in invisible colleges become connected at various levels and across organizations without the constraints of a formal structure. As people connect to each other, they are able to share their expertise with other members in the network. The knowledge that is shared in such conditions is called *social capital* (Burt, 1992). But, as part of the invisible college, research individuals and organizations only know part of the overall social network they belong to. It is necessary to increase the social capital in an invisible college so that each member can communicate with other members to whom they are not directly connected.

People are the best conduits of information. Thereby, academic meetings and conferences play an important role increasing the social capital, to the extent that they help to disseminate research and to promote analysis and criticism from other researchers. In addition, this type of events contribute to connecting and communicating members who belong to the same invisible college.

Social network analysis is a set of theories and models that focuses on the study of the relationships in a structure of agents making up a network (Wasserman & Faust, 1994). This type of analysis will help to quantify the social capital of SPDECE membership in terms of the discussed topics and the organizations participating in it.

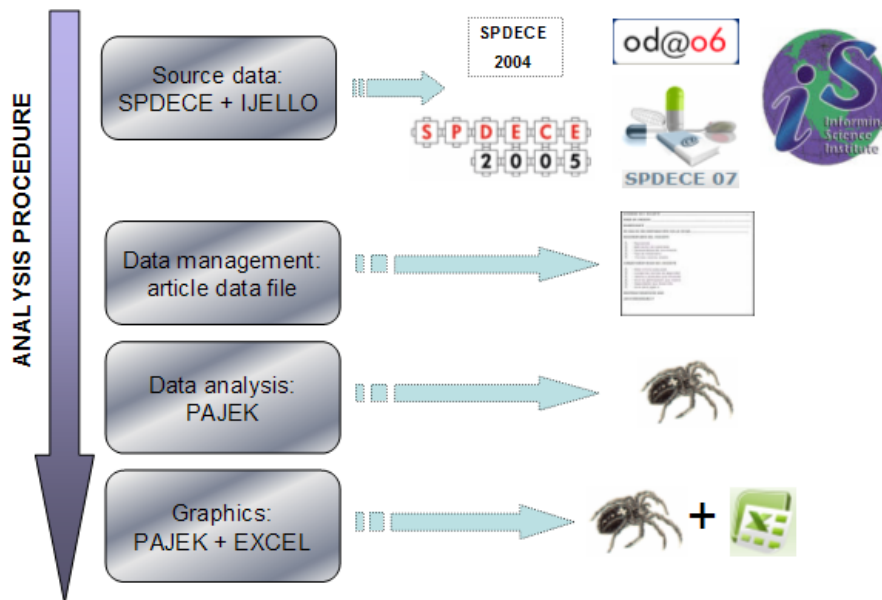


Figure 1. Procedure for the meta-analysis of SPDECE.

Figure 1 summarizes how the meta-analysis process of the articles published in SPDECE has been articulated (Molina, Muñoz & Domenech, 2001). An analysis of the articles published in SPDECE and IJELLO was made, to provide data on the year, title, author, organization, topics, citations, and keywords, which was entered onto a spreadsheet. Once all the necessary information was available, data was converted to a format readable by a tool for social network analysis. Finally, the results

were displayed directly on the social network analysis tool or exported back into a spreadsheet for the generation of charts.

Topic Ontology

The published articles were classified using the topic ontology from SPDECE. Given the evolving nature of the technologies involved in the design and development of learning objects, the topic ontology has also evolved throughout time. Therefore, the topic ontology is a collection of all the topics that have been handled during the different editions of SPDECE. Here is the list:

- Authoring tools
- Case Studies for the evaluation of learning objects and designs
- Conceptual maps
- Design and development of learning objects
- Evaluation methods for learning objects
- Learning objects and theories: reproduction vs. construction of knowledge
- Learning objects in the context of the European Space for Higher Education
- Life-long learning
- Metadata standards for learning objects
- Metadata- and ontology-based learning object description
- New learning environments and platforms
- Open Educational Resources
- Pedagogical criteria and learning models for the design of educational contents
- Repositories for learning objects
- Search and retrieval of learning objects
- Social networks for facilitating the access and development of educational resources

Organizing Collected Data

For each edition of SPDECE and IJELLO, data was structured using the following spreadsheets:

- **Authors (and organizations) - Articles:** this spreadsheet is the source for obtaining the number of authors per article, the number of articles per author, the number of organizations per article, the number of articles per organization, and collaborations between organizations.
- **Organizations - Articles:** the information about organizations, except for the average number of authors per article that an organization has, can be structured in this way for an easier study. This allows a more comprehensive analysis of the relationship between organizations. This spreadsheet is the source for obtaining the number of organizations per article, as well as the links between organizations.
- **Topics - Articles:** this spreadsheet is the source for obtaining the weight of each topic. It also helps identifying the relationship between topics.

- **Topics - Organizations:** this spreadsheet is the source for obtaining the weight of each organization and the topics tackled by the majority of the organizations.
- Most referenced authors.

Data Analysis with Pajek

Pajek is the network analysis tool selected for this meta-analysis. The choice of Pajek is because of its suitability for analyzing variable networks throughout time. In addition, it produces graphical representations of network structures, which form a key point to interpret some results (Nooy, Mrvar, & Batagelj, 2005).

Each of the spreadsheets mentioned in the previous section were transformed into Pajek format text files using a conversion tool. These are the resulting files:

- **Authors (and organizations) - Articles:** a bipartite network where the authors are the actors and the articles are the events. This includes a partition of organizations for indicating the organization each author belongs to, and an edges-list for the association of authors and articles. The partition of organizations allows the reduction of the bipartite network to a new one composed of organizations and articles.
- **Organizations - Articles:** a bipartite network where the organizations are the actors and topics are the events, with an edges-list for the association of articles and organizations.
- **Topics - Articles:** a bipartite network where the topics are the actors and the articles are the events.
- **Topics - Organizations:** a bipartite network where the topics are the actors and the organizations are the events.
- **Topics - Articles (of all the conferences):** a bipartite network where the topics are the actors and articles are the events. This includes a partition of conferences for reducing the network to topic-conference level.

Results

This section is divided into the following sub-sections: first, the analysis of topics is presented; second, the analysis of organizations is shown; third, the influence of REDAOPA members is studied; fourth, the form of the articles is summarized; fifth, most referenced authors are listed; finally, we end with an analysis of the program committees.

Topics

Since the classification of the articles by topics was not available, in order to perform an analysis of the topics, the abstracts of the articles were read to identify the topics. In this section, the distribution of the topics is analyzed first, comparing the relevance of each topic within SPDECE and IJELLO, and studying the evolution of each topic throughout time. Next, the study of the importance of each of the topic areas (technological and pedagogical) is described. Finally, the relationship between the topics is examined.

Topic distribution

Figure 2 shows the distribution of topics accumulated in the four editions of SPDECE (2004, 2005, 2006 and 2007). Figure 3 shows the distribution of topics for the journal IJELLO accumulated in its four volumes (2005, 2006, 2007 and 2008 up to April).

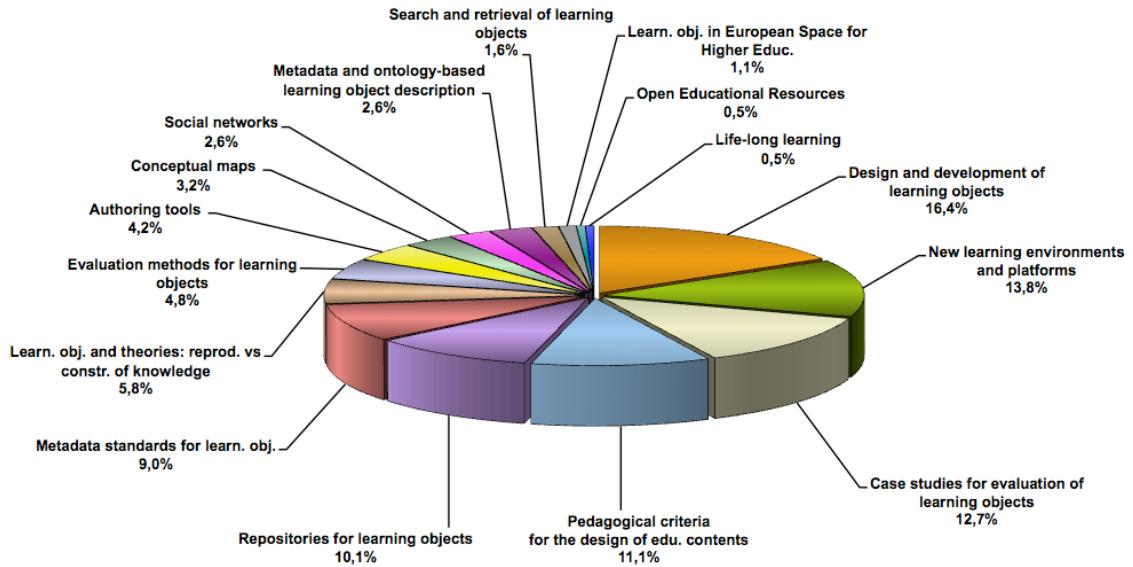


Figure 2. Topic distribution in SPDECE

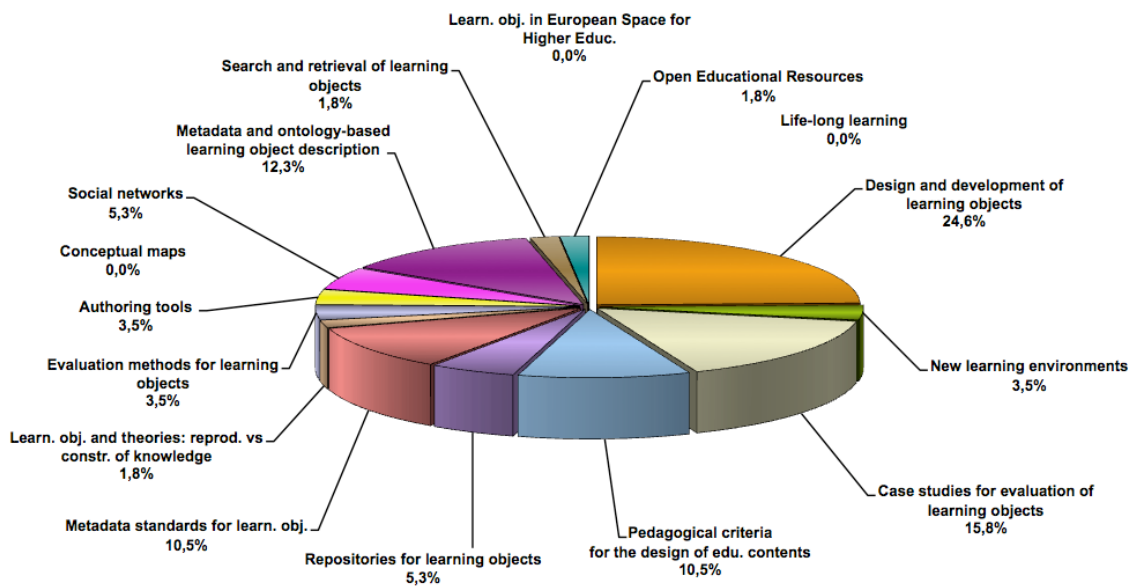


Figure 3. Topic distribution in IJELLO

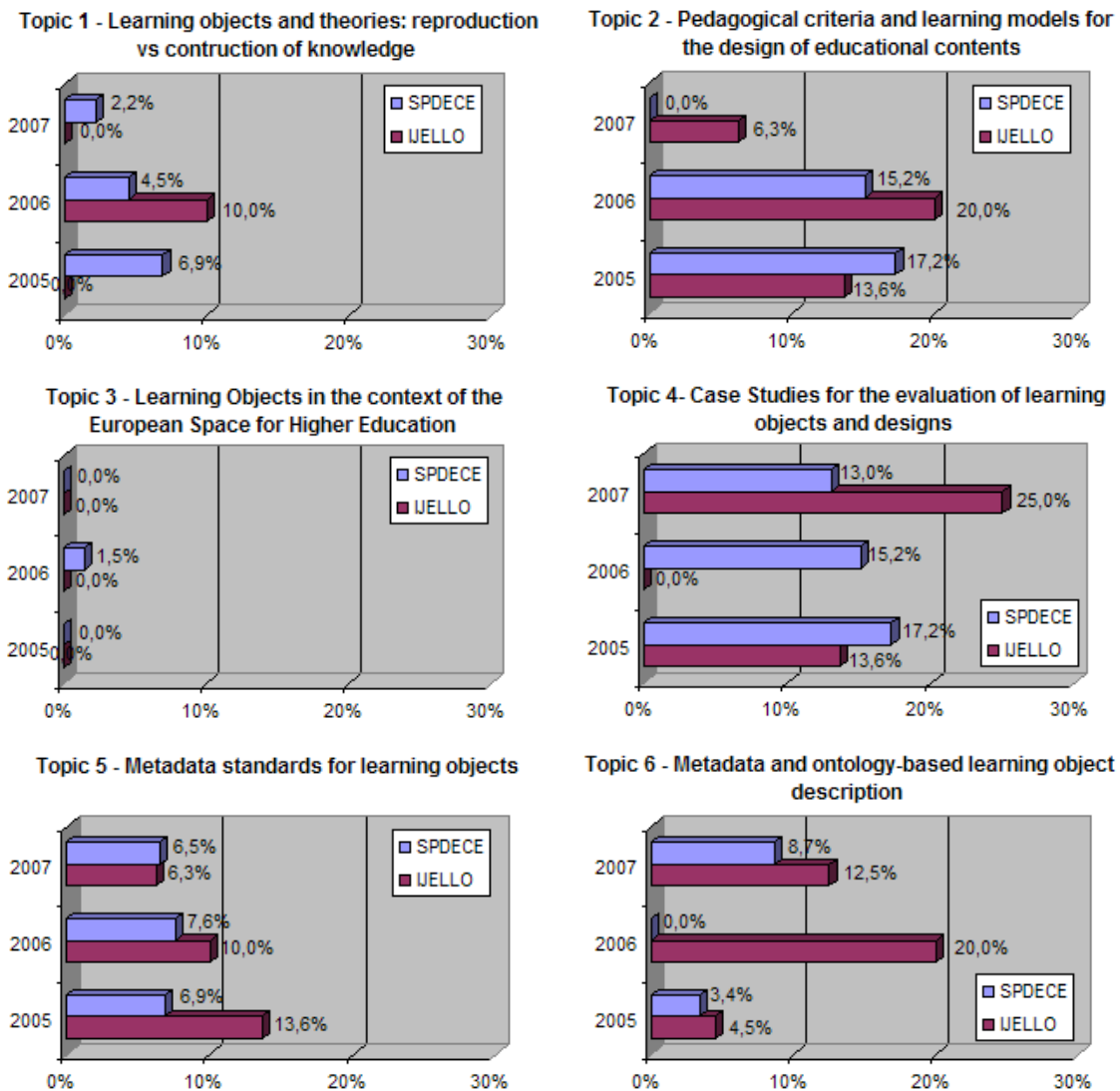
The diversity of the topic network in SPDECE highlights not only the multidisciplinary nature of the conference, but also the complexity of the problems associated with the design, development, and good use of learning objects. However, the diversity is not so marked if the weight of each of the topics is taken into account, because those topics traditionally associated with learning objects are more widely discussed than others.

A few significant differences can be drawn out from Figure 2 and Figure 3, for instance "design and development of learning objects" is the most discussed topic both in IJELLO and SPDECE, but this topic has a much greater impact in IJELLO. The topic "metadata- and ontology-based learning object description" in IJELLO is more important, reaching the third position with 12.3% compared to 2.6% in SPDECE; and the topic "new learning environments and platforms" has less relevance in IJELLO, with 3.5% compared to 13.8% in SPDECE. The dissemination of "case

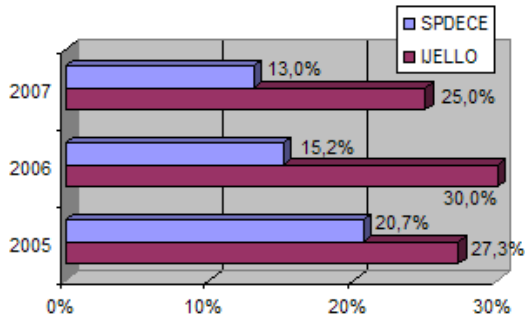
studies for evaluation of learning objects" and "pedagogical criteria and learning models for the design of educational contents", with rates of 15.8% and 10.5% respectively, have a similar level of significance in both SPDECE and IJELLO. Finally, it should be noted that IJELLO does not deal with certain topics tackled in SPDECE, such as "learning objects in the context of the European Space for Higher Education", "life-long learning" and "conceptual maps."

Comparing SPDECE with IJELLO, the latter seems to be more focused on topics directly related to learning objects. The topic "new learning environments and platforms", which generally tend to accommodate articles on specific e-learning tools and LCMS platforms, has little impact on IJELLO because this type of articles generally describes characteristics of tools or platforms instead of the use of learning objects within them.

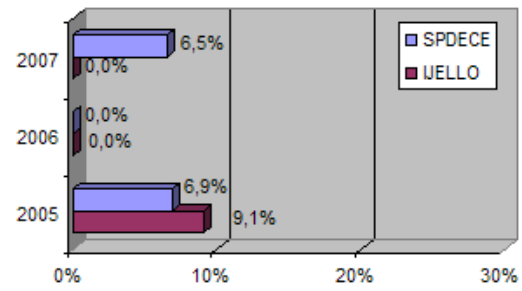
Continuing with the comparative analysis between topics, charts in Figure 4 show the evolution of the sixteen topics in SPDECE and IJELLO over common periods.



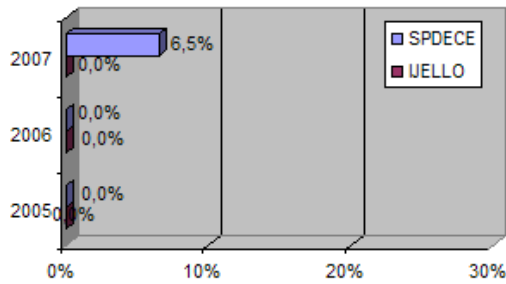
Topic 7 - Design and development of learning objects



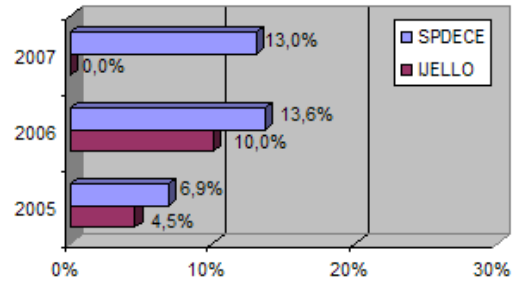
Topic 8 - Evaluation methods for learning objects



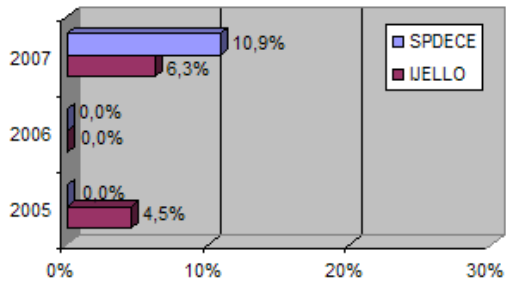
Topic 9 - Search and retrieval of learning objects



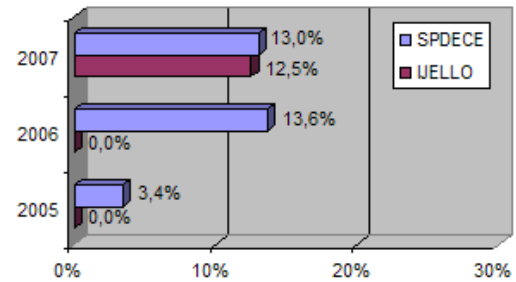
Topic 10 - Repositories for learning objects



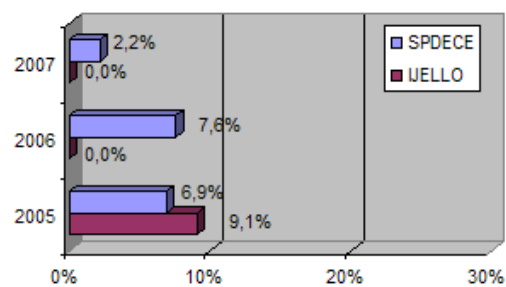
Topic 11 - Social networks for facilitating the access and development of educational resources



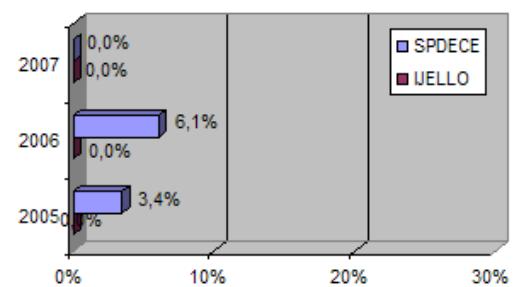
Topic 12 - New learning environments and platforms



Topic 13 - Authoring tools



Topic 14 - Conceptual maps



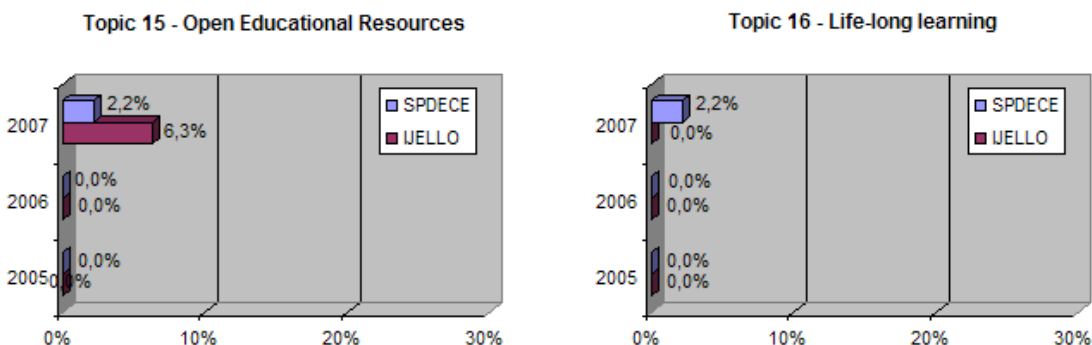


Figure 4. Topic evolution over time in SPDECE and IJELLO

Figure 4 shows the decline of articles based on actual experiences and examples in SPDECE. This can be considered as a proof of the difficulties of implementing the reference framework of learning objects, or at least part of it, on teaching and learning processes based on ICT. This makes it more difficult to progress in the practical field, because it is difficult to get the feedback that could help improving learning objects reference framework.

It can be also noticed how topics related to learning object repositories and new web tools for searching and sharing learning objects, such as "search and retrieval of LOs" and "social networking", have appeared and increased their outreach. This may be the reason why the central topic of SPDECE "design and development of learning objects," has slightly lower weight in the latest editions.

Topic areas

Figure 4 shows a significant decline in SPDECE on the topics "learning objects and theories: reproduction vs. construction of knowledge" and "pedagogical criteria and learning models for the design of educational contents", which means fewer articles associated with pedagogical research, and an increase in the topics associated with technology. Figure 5 shows the relevance of the two major topic areas.

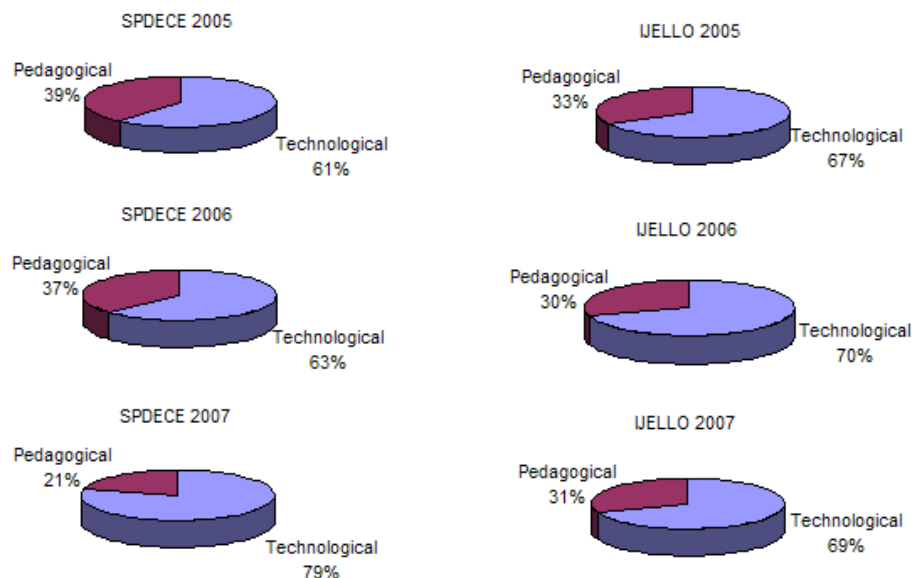


Figure 5. The relevance of the topic areas in each SPDECE edition and IJELLO volume

Relationship between topics

To complete the analysis of topics, Figure 6 and Figure 7 represent the network of links between topics for SPDECE and IJELLO, respectively, obtained through the papers with more than one topic.

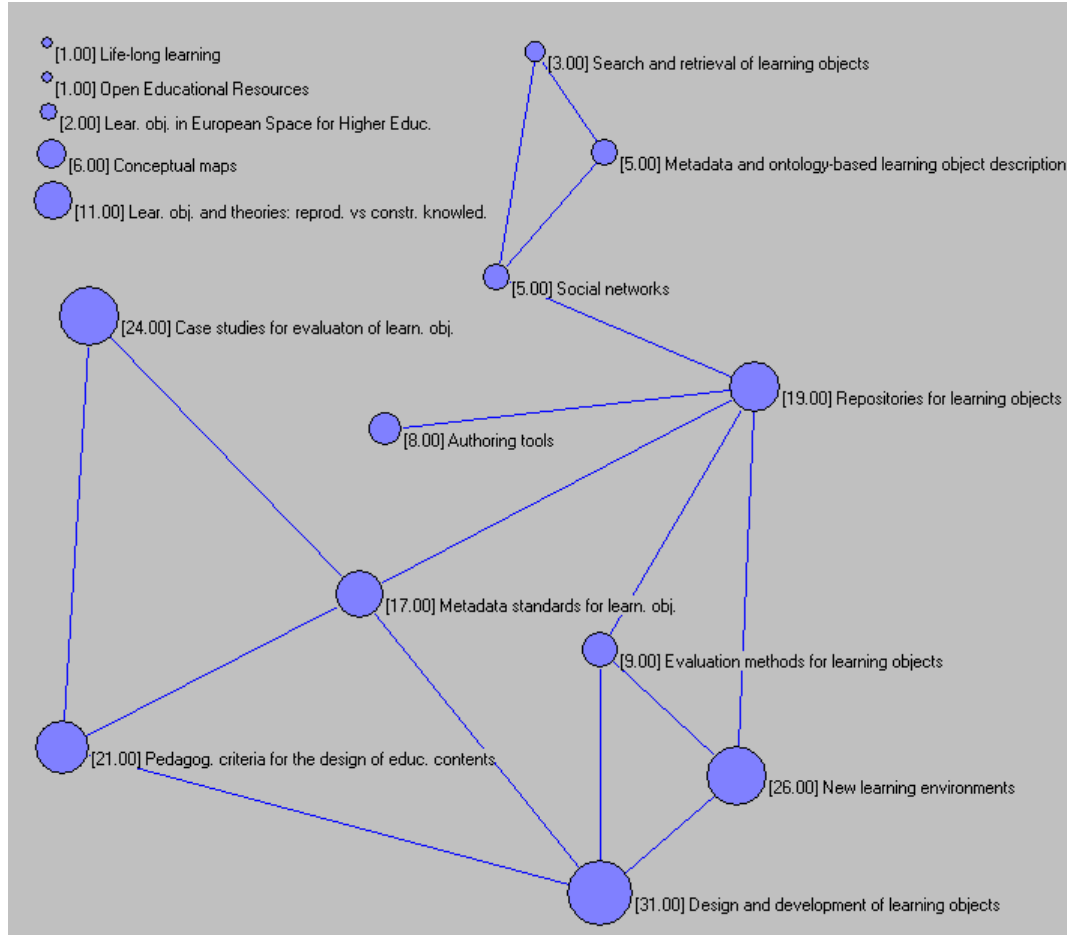


Figure 6. Networks of links between topics for SPDECE

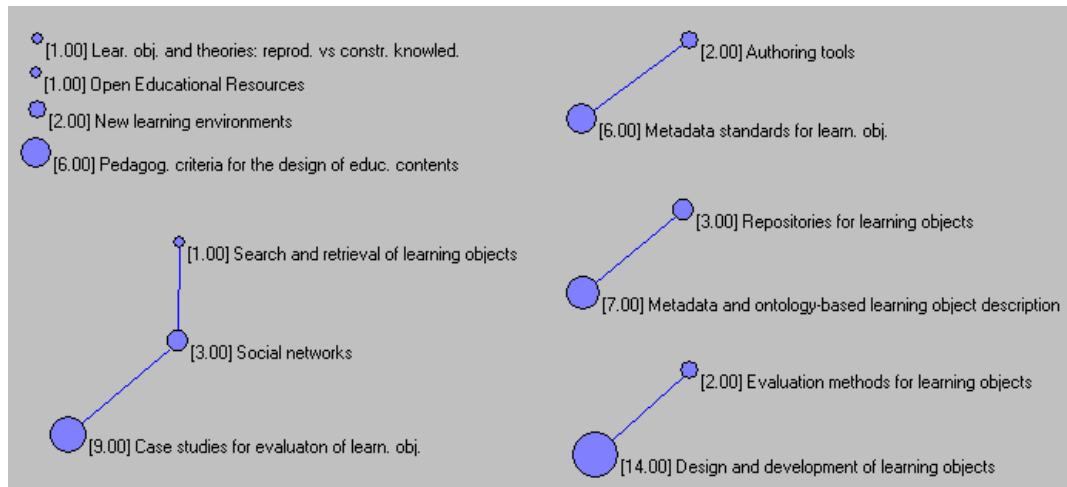


Figure 7. Networks of links between topics for IJELLO

In Figure 6 two areas can be distinguished:

1. The one made up of those topics that are not linked with any other.
2. The large group of topics loosely-connected to other topics.

The network of topics of SPDECE has a low density (13%) because it is a low-cohesive network. Despite the low density of the topic network, it is noticeable that the most important relationships are established through the cores corresponding to the topics "repositories of learning objects" and "metadata standards for learning objects". It is also noticeable that the topic "repositories of learning objects" is a gateway to the diversity of the network for new topics, such as "social networking", "search and retrieval of learning objects" and "metadata- and ontology-based learning object description".

On the other hand, in Figure 7 two areas can be distinguished:

1. The one made up of those topics that are not linked with any other.
2. The large group of topics linked only with another one.

This structure gives the network of topics of IJELLO a very low density. Topics are connected in pairs, but these pairs are not connected to others. As a result, the network structure is so simple that no core or gateway nodes can be identified.

Organizations

The analysis of networks of collaborations created as a result of joint cooperation performed by researchers from different organizations, leads to the charts in Figure 8 and Figure 9.

Figure 8 shows the collaborations between the 75 organizations participating in SPDECE. In this figure three areas can be distinguished:

1. Organizations that have no connection with any other.
2. Isolated sets with a small number of organizations (two or three).
3. High-cohesive groups of organizations.

Inside the third area we can distinguish a complex network that will not be considered for the analysis because it arises from a single article in which a very large number of organizations were involved.

The network of organizations contributing to SPDECE has a very low density (3.13%), that is, it is low-cohesive network because there are many isolated nodes and those that are interconnected are only connected to a few other nodes. In order to qualify the intermediary index of the organizations, Table 1 lists the organizations operating as gateways and cores. Gateways are nodes that allow access to the diversity of the network, whereas cores are nodes that play a key role in the creation of cohesive groups.

Figure 9 shows the collaborations between the 57 organizations participating in IJELLO. In this figure two areas can be distinguished:

1. The group of organizations that have no connection with any other.
2. The group of isolated organizations pairs.

The network of organizations that makes up IJELLO has a very low density, as organizations are connected in pairs, but these pairs are not connected with others. Therefore, as it has been explained before with topics, the network structure regarding IJELLO is so simple that no core or gateway nodes can be identified.

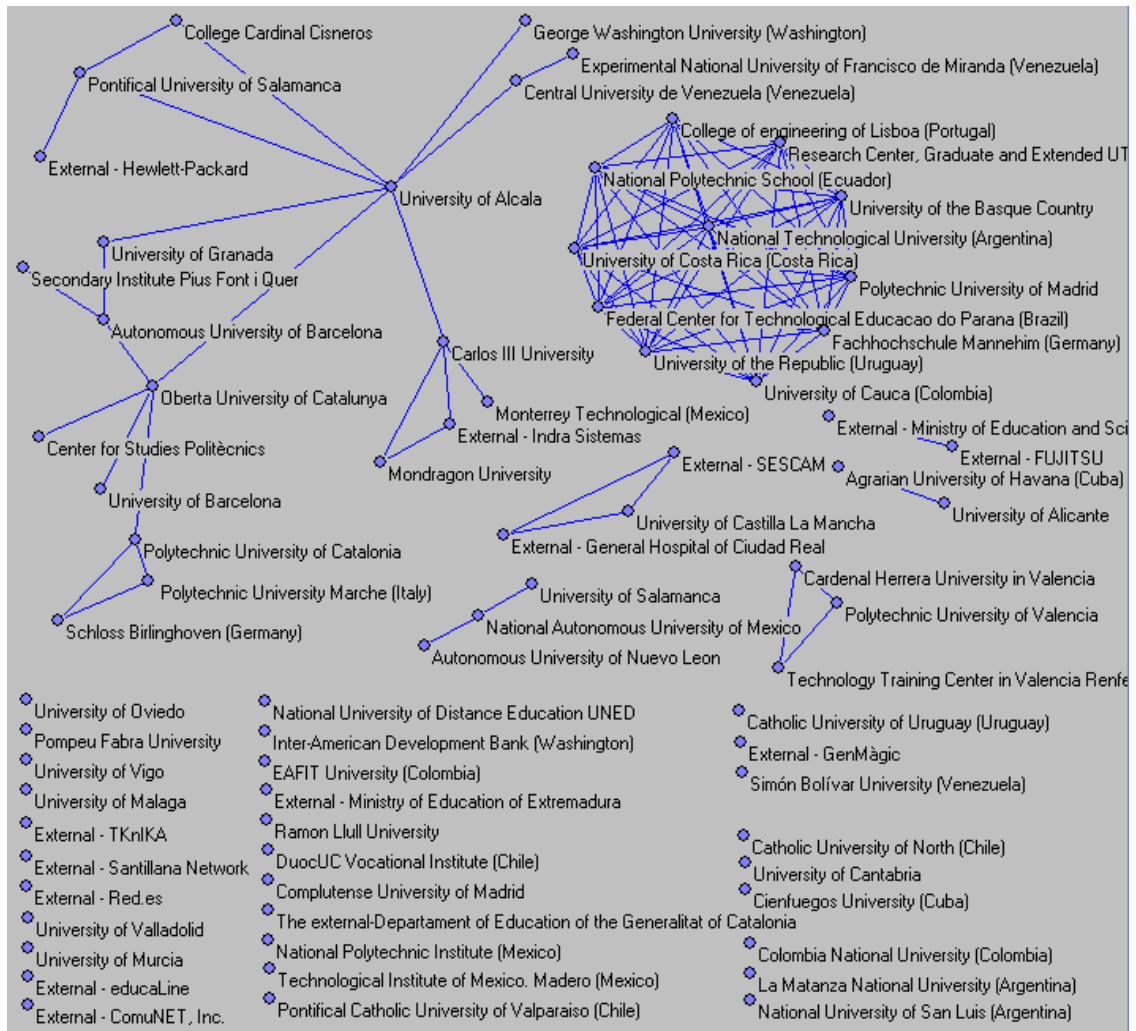


Figure 8. Network of collaborations between organizations in SPDECE

Table 1: Gateway and core nodes in organization network in SPDECE

| GATEWAY | CORE |
|-------------------------------------|------|
| University of Alcalá | |
| Oberta University of Catalunya | |
| Carlos III University | |
| Polytechnic University of Catalunya | |
| Autonomous University of Barcelona | |
| Pontifical University of Salamanca | |
| Central University de Venezuela | |

Meta-analysis of the Articles Published in SPDECE and its Comparison with IJELLO



Figure 9. Network of collaborations between organizations in IJELLO

In order to determine the most important organizations in SPDECE, the percentage participation of each organization according to its number of articles has been obtained. Figure 10 shows the importance of the most participative organizations, among a total of 75, accumulated through the four editions. The same information is shown in Figure 11, but in this case for IJELLO, in which a total of 57 organizations have published papers in the journal.

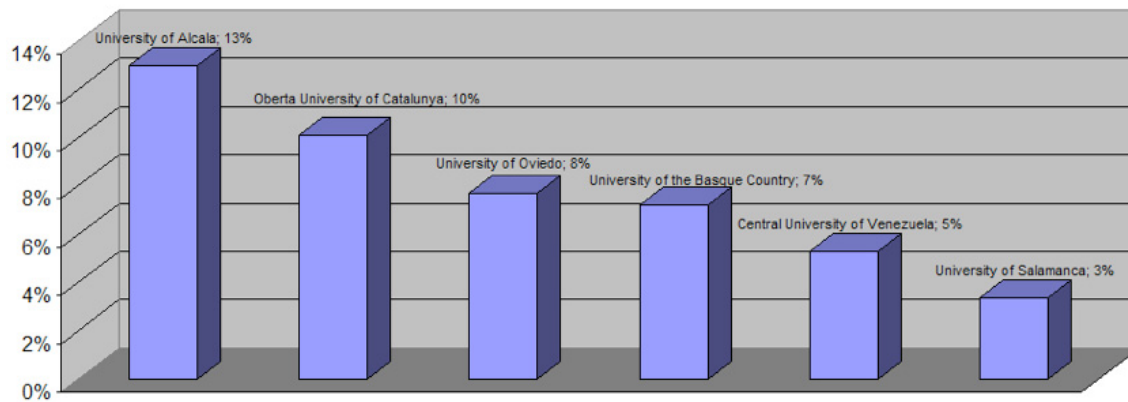


Figure 10. Organizations in the accumulated of SPDECE

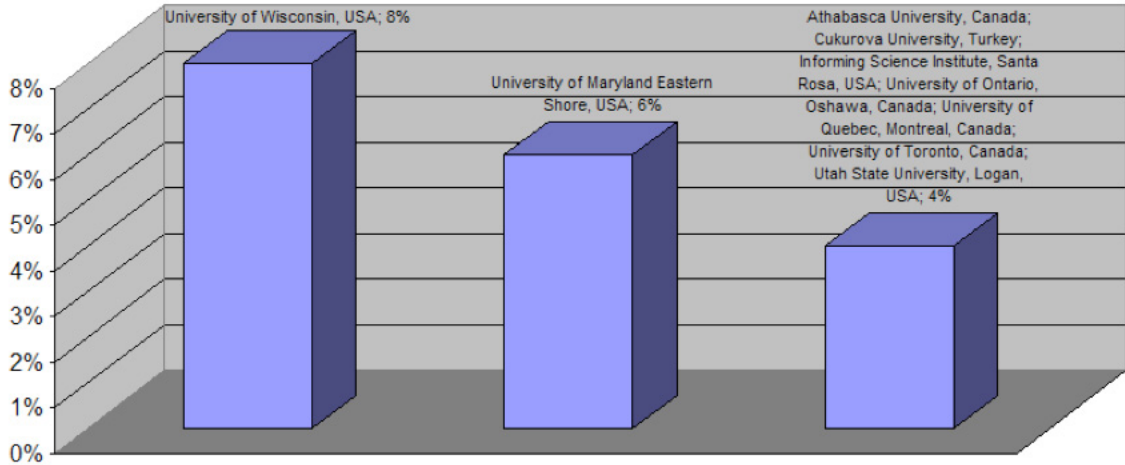


Figure 11. Organizations in the accumulated of IJELLO

In the case of SPDECE, the 53% of the participation not represented in Figure 10 is spread across 69 organizations. It is important to highlight the presence of the Central University of Venezuela with the 5% of the articles, which gives to SPDECE a worldwide exposure.

In the case of IJELLO, the other 58% of the participation not represented in Figure 11 is spread across 48 organizations, which have only one article each one.

Figure 12 shows the evolution of the participation of each organization according to the number of articles published in SPDECE. In 2004 and 2006, the universities that hosted SPDECE conference, the University of Alcala de Henares and the University of Oviedo, respectively, were the most participatory. The same analysis has been done for IJELLO, but the figure has not been presented in this paper because the results are not representative.

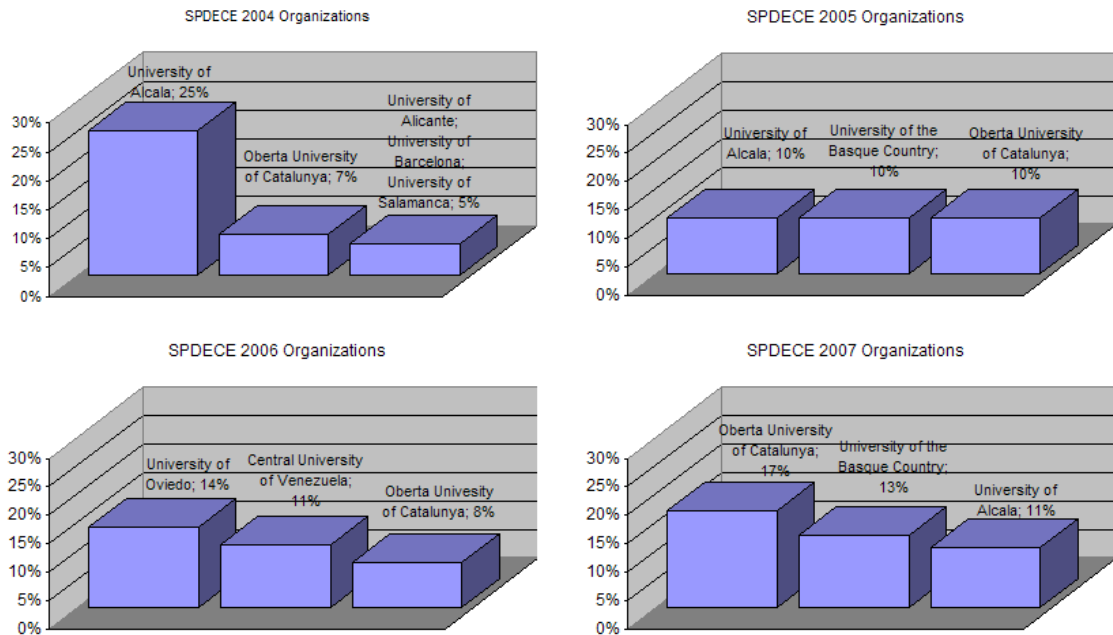


Figure 12. Organizations in the different editions of SPDECE

The Influence of REDAOPA

The impact that REDAOPA members have on SPDECE has been calculated through the participation level of authors that belong to REDAOPA. The results are shown in Figure 13, for the accumulated within the four editions, and in Figure 14, for each edition of the conference.

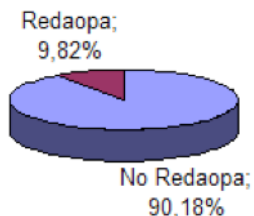


Figure 13. Participation of REDAOPA members in SPDECE

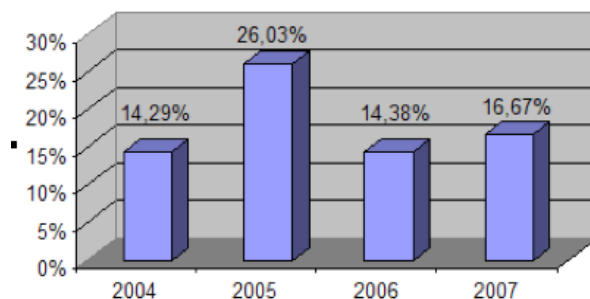


Figure 14. Participation of REDAOPA members in each edition of SPDECE

The Form of the Articles

The evolution of the average number of authors per article along the different editions and volumes of SPDECE and IJELLO, respectively, is shown in Figure 15.

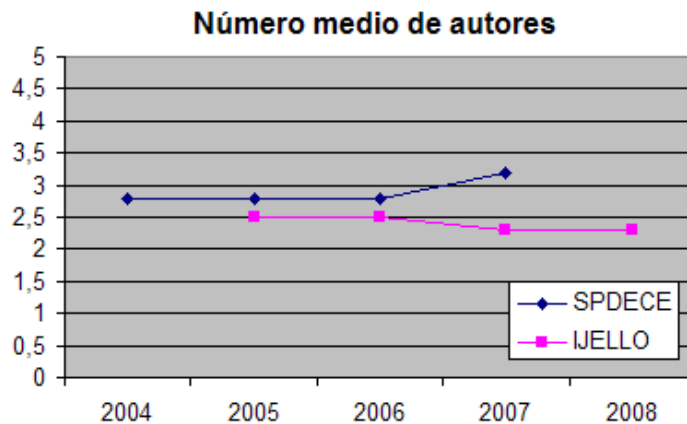


Figure 15. Average number of authors per article in SPDECE and IJELLO

In SPDECE the average number of authors per article has grown considerably in the latest edition. This can be explained bearing in mind that the multidisciplinary nature of the conference favors the inclusion of new topics that require the collaboration of researchers with different profiles. On the other hand, IJELLO has a smaller number of authors per article, which in recent volumes has even followed a downward trend. This may be due to the fact that IJELLO is a more focused journal, so it requires a smaller but more specialized number of authors per article.

Most Referenced Authors

The most referenced authors in the articles submitted to SPDECE are shown in Figure 16, where bigger points mean the authors have been referenced more frequently.



Figure 16. Most references authors in SPDECE

The most referenced authors are Miguel Angel Sicilia and Elena Garcia with their article "On the concepts of usability and reusability of learning objects." These authors are followed by David A. Wiley, the next most cited author with his article "Connecting Learning Objects to Instructional Design Theory: a Definition, a Metaphor and a Taxonomy;" Stephen Downes, whose several articles are referenced; and Pithamber R. Polsani with his article "Use and abuse of reusable learning objects."

Scientific Committees

Figure 17 presents the technological and educational balance of the scientific committees through the four editions of SPDECE.

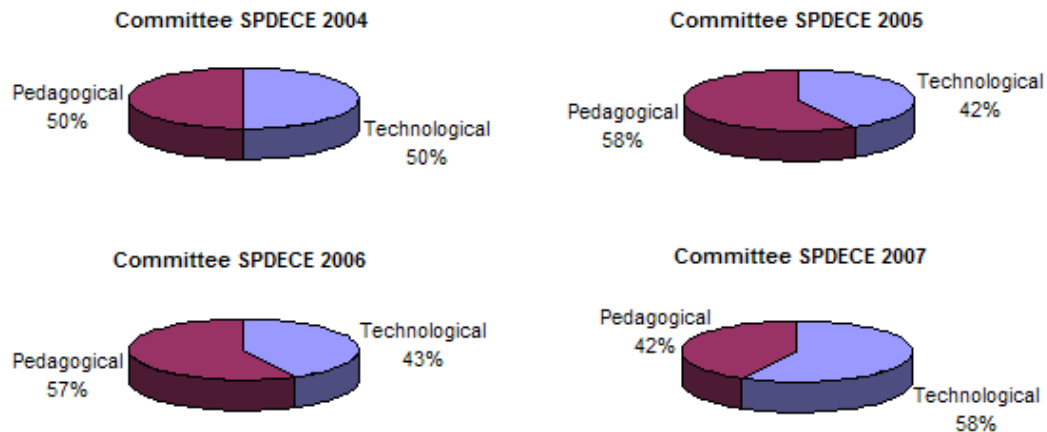


Figure 17. Scientific committees in SPDECE

Conclusions

The diversity of the topic network underlines both the multidisciplinary nature of SPDECE conference and the complexity of the problems associated with the design, development, and best practice in using learning objects. However, if the importance of each topic is taken into account, the diversity of topics leads to the following observation: those topics traditionally associated with learning objects are extensively discussed. Furthermore, the importance of topics related to the technological area increases at the expense of topics related to pedagogy. The reason for this may lie in the profile of the scientific committee members responsible for reviewing the articles.

But surprisingly, except in 2007, members of the scientific committees with a technological profile have been a minority compared to those with an educational profile.

The number of articles based on real experiences and practical examples has been reduced, which is an indicator of the existing difficulty in applying the learning object reference framework to educational organizations. As mentioned earlier, this makes it more difficult to progress on the practical field. It also makes it difficult to get the feedback that may help to improve the learning objects reference framework. Comparing the topics of SPDECE with those of IJELLO, it is noticed that IJELLO seems to be more focused on topics directly related to learning objects. Therefore, some of the topics covered in SPDECE have no impact or are only briefly discussed in IJELLO.

SPDECE network of organizations stands out for its low density and cohesion. The answer to this issue can be found in the way in which scientific networks are formed. Research collaborations usually take long periods of time before any result is obtained; on the other hand, participation in conferences is a result of a collaborative process that may have begun in other ways such as workshops, lectures, or doctoral dissertations. Nevertheless, the conference is maturing year by year and, as a result, it is notable that SPDECE 2009 will be held in Mexico. Thus, it can be concluded that in four years there has been enough time to build and to strengthen scientific relationships within the Spanish-speaking research community on learning objects worldwide.

The meta-analysis has shown significant indicators of the structure of influences of SPDECE, as it is perceived from the articles, in which the University of Alcalá and the Open University of Catalonia stand out as the catalysts of the collaborations between organizations. In addition, a number of organizations have been identified as network gateways, so we can talk about a strong backbone, formed of a small number of organizations, with which a frequent contact is maintained, and some edges, with which the relationship is weaker and specialized.

When comparing SPDECE and IJELLO organization networks, it is clear that the cohesion in SPDECE network is higher than in IJELLO. This can be attributed to the fact that conferences are perhaps more indigenous as there is a core of people who attend to them year by year, whereas contributions to journals tend to be loosely connected and more infrequent.

READAOPA members provide balanced and sustained support over time. Moreover, the edition published in 2005 reflects that its impact is very noticeable even though participation is lower than usual. As a result, regarding the activity in the conference, it can be asserted that the lower the number of submissions, the greater the importance the members of REDAOPA acquire.

The number of citations received by the most referenced authors is not as remarkable as the fact that those citations reference, in most cases, the same publication. Broadly speaking, we can attribute the influence of most referenced authors not only to their publications, but also to their participation in other conferences and forums; to the relations established through PhD dissertations; and to the experiences and research results published in the new carriers for shared knowledge, such as wikis, blogs, and social networks.

As future work, we recommend an analysis of the network of co-authorship with regards to the topics of study in order to observe the viral effect of the influence among researchers. To that end, it is essential that the registration information of the articles of SPDECE will be available in the future, especially the data concerning the topics of each article.

Finally, to achieve a better dissemination of the results obtained from this work, it would be conducive to create a website linked to the conference where all the data and results would be available to further continue and enrich the study in the future in a flexible manner.

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Biographies



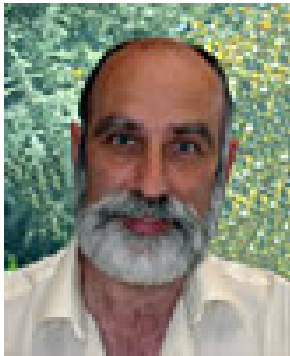
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