AINA: Disney Animation Information as Educational Resources

Piedad Garrido, Fernando Repulles, Andy Bloor, Julio A. Sanguesa, Jesus Gallardo, Vicente Torres, Jesus Tramullas

Abstract—With the emergence and development of Information and Communications Technologies (ICTs), Higher Education is experiencing rapid changes, not only in its teaching strategies but also in student's learning skills. However, we have noticed that students often have difficulty when seeking innovative, useful, and interesting learning resources for their work. This is due to the lack of supervision in the selection of good query tools. This paper presents AINA, an Information Retrieval (IR) computer system aimed at providing motivating and stimulating content to both students and teachers working on different areas and at different educational levels. In particular, our proposal consists of an open virtual resource environment oriented to the vast universe of Disney comics and cartoons. Our test suite includes Disney's long and shorts films, and we have performed some activities based on the Just In Time Teaching (JiTT) methodology. More specifically, it has been tested by groups of university and secondary school students.

Keywords—Information retrieval, animation, educational resources, JiTT.

I. Introduction

IR has become a key element for university students. As well as considering future competitive work environments, in which the proper management of information will be crucial, students must be able and competent in their academic activity. Specifically, it is highly recommended that students know and handle proficiently search strategies and IR [1], [2]. Students should: (i) understand their information requirements, (ii) know how to locate the information they need, (iii) evaluate the information they have located, (iv) use information in accordance with ethical and legal principles, and (v) know how to adequately communicate new information.

With the emergence and development of new technology at all educational levels and in particular at University, teachers must adapt, not only in their teaching strategies but also in student learning styles [3]. The information society in which we are immersed, as well as the current model of Higher Education, require us to educate students in a series of skills beyond of memorization or knowledge about specific content. These and other aspects force us to use innovative teaching resources, since they are a key element in the teaching of students.

Piedad Garrido, Fernando Repulles, Julio A. Sanguesa, Jesus Gallardo, Vicente Torres and Jesus Tramullas are with the University of Zaragoza, Spain(e-mail: {piedad, fergolie, jsanguesa, jesusgal, vtorres, tramulla}@unizar.es).

Andy Bloor is with the Canterbury Christ Church University, UK (e-mail: andy.bloor@canterbury.ac.uk).

In our current work, we focus on students as future professionals, and consider the important role they will play in the use of IR tools. One of the shortcomings that we have observed is that the training and preparation of current teachers in this area needs to be significantly improved. How can we require teachers to use innovative teaching resources, which are useful and interesting for their work in the classroom, if the students have not been monitored in the selection of good query tools?

In this work, we present AINA, a computer system designed to measure, enabling analysis, the selection of multimedia IR of Disney animation as an information resource. Since the public for whom this system designed are the future graduates in Primary and Child Education, we have chosen to work with animation teaching resources, so that the results are more attractive for students, and we thought it useful for their professional future. In addition, to provide support for the creation of IR systems, we intend to make available to future teachers a strategic tool integrating innovative educational and cultural resources for use in the classroom. AINA includes detailed information of Disney features and short films, because as educational resources, we believe that the messages they convey can be exploited as learning opportunities if they are used appropriately.

Past experience [4] has shown how cinema can act as a teaching and learning resource and that media, in particular the cinema, can act as an informal educator. As Méndez says [5], the playful dimension of cinema can have a formative effect on children and if teachers have the tools and an appropriate framework, (training, critical attitude, learning predisposition, etc.) it is conceivable that more formal educational objectives could be used.

This paper is organized as follows: Section II presents our proposal based on its functionality, architecture and pedagogy. Section III explains in detail aspects of the experiment carried out. Section IV presents and analyzes the results obtained from the questionnaires completed by students who have participated in the experience. Finally, in Section V, we present the most significant conclusions and implications for future work.

II. Our Aims: Functionality, Architecture and Methodology

As discussed in the previous section, we aim to improve training in IR for college students. However, we believe

that students should progressively work towards these competencies. Although in this work we have focused mainly on primary school teachers, we performed experiments using our tool with students from a secondary school. We expected that students would be able to check the usefulness of IR tools for their academic work, and for their future professional work. In addition, by using our tool, students can see the difficulties in obtaining useful information when you are working with large amounts of data.

When searching for existing animation resources about Disney, we found that the major reference sources are quite diverse (e.g. IMDb.com, doblajedisney.com, Rottentomatoes.com, eldoblaje.com, or Wikipedia). These repositories also contain different information, which makes it necessary to execute the same query for each one of them. In addition, all of them use different classification systems, searching options and different styles of presenting the information. Taking into account that the users are relatively inexperienced, they usually decide to limit the data collected to information on the subject in which they are particularly interested.

Before AINA, we used educational resources in the classroom related to animated films, in the form of note cards created in Microsoft Word. In these cards, teachers had manually merged all the descriptive information obtained from the various sources mentioned above [6]. These note cards contained many fields (such as title, year of release, dubbing director, translator, distribution, etc.). We have built up about 500 sheets about animation resources, from Disney and other studios. As expected, the vast amount of information from these sheets made for tedious handling by both students and teachers. Taking this into account, we proposed to build an information system that was able to facilitate the search process to support students in improving their learning approach in the classroom, and at the same time include the current content from educational resources in a relatively new format.

In this section, we outline AINA, which supports the creation of educational resources in electronic format in the classroom. Specifically, we present AINA from two points of view: (i) A detailed description about the architecture of the information system and its operation, and (ii) The methodological improvements in the classroom, from traditional pedagogy, where the teacher was the center of the class and students recipients of knowledge, to a more progressive approach that, encourages interaction between study tasks through the web and the active learning approach JiTT [7]. Although initially this was developed to be used by Trainee Teachers at the University, we believe that it can equally be used by students from other areas and at other educational levels.

A. Functionality

In order to gather the information about Disney movies, the information system should satisfy the following requirements: (i) Centralization: Students should be able to access all the

Fig. 1 AINA's Architecture

information about the movie in the same place, without having to perform individual searches on each of the sites available on the Internet, (ii) Avoiding redundancy and inconsistency: This is an essential feature for students to enable them to use the tool correctly, (iii) Flexibility: To upgrade or expand the information, (iv) Availability: The application will be online, 24 hours a day, 7 days a week to allow students to access the tool anywhere, and finally, (v) Interoperability: It is vital that there is comparability between several information sources and the use of different browsers to access the tool must be possible.

B. Architecture

To implement the prototype, we used a total of 371 long and short films from Disney previously stored on sheets in different Word documents. In order to automate information processing, we tried available Database Management Systems (DBMS) such as MySQL, FileMaker Pro, Microsoft Access and Open Office Base, etc. However, we finally decided to use the combination of technologies that we discuss below.

The combined technologies for the creation of AINA has allowed us to create a more powerful and versatile system designed to analyze the vast universe of comics and cartoons, showing that they can be a very interesting, educational and cultural resource for students and teachers.

At the time of developing the system, we integrated different technologies at the presentation, domain and persistence levels, bearing in mind the separation between them and how this can create a level of disengagement (see Fig. 1). We will list these technologies, including a brief commentary showing their importance in the development of AINA. We opted for a multi-layer architecture with three layers (presentation, business logic and data), on a single level, since all of them will run at on single computer.

Regarding the technologies used in the presentation layer, since the whole interface is web type, the basic technology used is the HyperText Markup Language (HTML). Currently, version 5 of HTML provides tools that integrate with versatility, allowing new elements and functionalities which could have previously only been achieved by embedding other
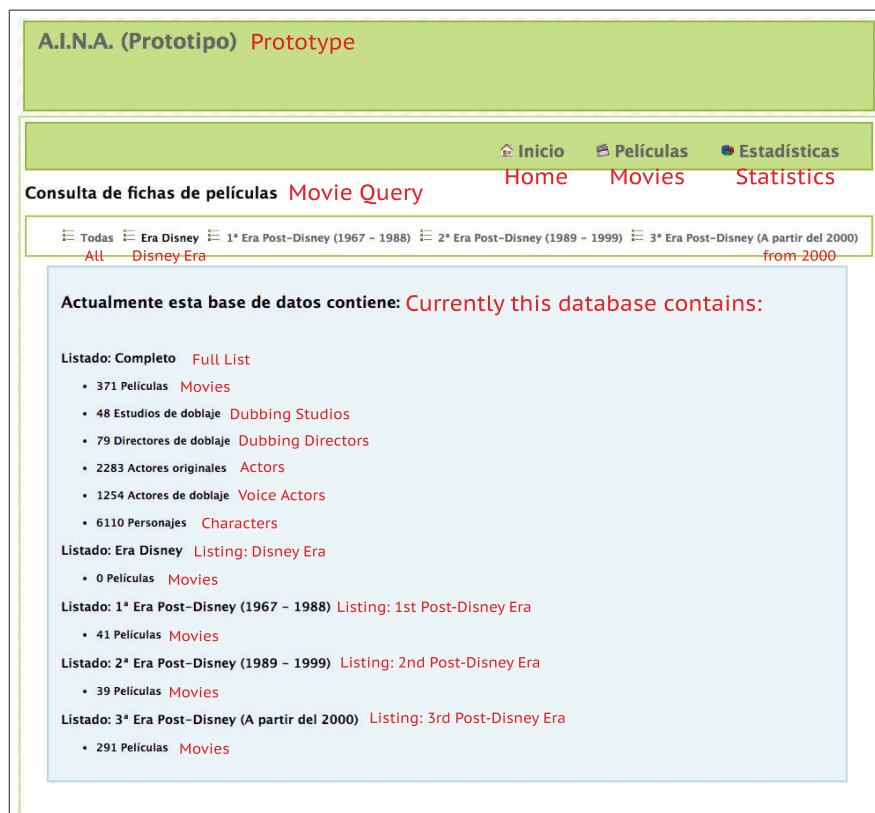
Fig. 2 List of films included in AINA

technologies in the code (JavaScript, etc.). In our system, the presentation of the queries (note card listings, cross cards information) is specified using HTML and Cascading Style Sheets (CSS) technologies. For Style Sheets we used CSS 3, which has been a breakthrough in terms of the possibilities regarding previous versions of the specification. In the developed information system, CSS is used to provide a uniform format across different HTML documents.

Regarding the technology business layer, we used PHP Hypertext Pre-processor and DocBook. Specifically, AINA have used the following PHP function libraries:

- FTP management functions
- MySQL management functions
- XML Simple Extension
- XAJAX Library
- JpGraph Library

AINA also uses DocBook, an Standard Generalized Markup Language (SGML) vocabulary maintained by OASIS and used for writing technical documentation (manuals, books and articles). This currently has a Document Type Definition (DTD) for eXtensible Markup Language (XML), which allows us to interpret it as a marks based language, adapted to a specific domain, which can then be easily processed. In our proposal, we used DocBook semantic language to unify the content and the meaning of the repository, without having to worry about the appearance or the way to display information.

Regarding the technologies used at data layer, we needed some type of DBMS that supports the storage of structured information. In our case, we chose MySQL, because it is the most popular open source DBMS and we usually used it in projects with information that is accompanied with metadata. MySQL provides storage and management mechanisms that allow the proper handling of the metadata generated by DocBook with accompanying repository basic information [8]. Fig. 2 presents a summary of the films included in our application.

Finally, the strength of AINA's architecture is having integrated DocBook in the system, not only as a dialect of SGML, but also as a metadata language to unify information resources. In this way, we have enriched existing resources with additional on-line information, thereby improving the quality and effectiveness of information searches, as well as clarifying and managing them easily. In addition, it will now be easier to perform statistical studies with the information generated by users of our tool.

C. Methodology

As previously discussed, in this article we present the implemented tool and the experience of transforming the old sheets about Disney movies created in Microsoft Word in an

information system. Thus, we aim to encourage our students to use the teaching resources based on Information Technologies, thereby promoting interaction between study tasks through the Web and active learning.

JiTT is a student focused approach that uses feedback between classroom activities and work that students do at home, in preparation for classroom based activities. The goals are to increase learning during classroom time, to enhance student motivation, to encourage students to prepare for class, and to promote active adaptation to troubleshooting problems. The activities we have created are underpinned by this pedagogical approach.

Since launching a new approach is always a significant undertaking for teachers, and since students are often reluctant to change, we considered it necessary to encourage the students to consider the use of computer resources as a tool for teaching and learning. Having taken all of this into account we designed the AINA tool, that uses animation films to attract the interest of students whilst giving students some strategies about IR. We have found initiatives that propose similar techniques, such as the NMC Horizon Report > 2015 Higher Education Edition [9], or projects like MIT + K12 [10], which has a database of online video-lessons for science and engineering students from middle education onwards.

III. Lab Tests

To implement AINA on teaching and learning materials, demonstrating that it may be useful in different educational environments, we decided to select three groups of students from two different types of environments in our sample: University students and school children. Two pilot groups were chosen: (i) The 4th year students of the subject "Resources for EFL in infant school", studying an Early Childhood Education Degree at the University of Zaragoza, and (ii) A group of former High School Science students from the Las Viñas College. The total number of students who participated in the experiment was about 75.

The teaching approach used in both settings was the traditional one, with a focus on rote learning and discipline and whose only resources in the classroom are basically the master class and the blackboard, the textbook, or instead, the material prepared by the teachers themselves.

Case studies raised were as follows: In the university group, we supported students with the development of a teaching unit which adhered to specific requirements, detailed in Fig. 4. In addition, we asked them to assume they were now fully qualified teachers and then tell us how they would use them in the classroom. In the group of school students, we took advantage of a school study trip to London. We asked them about the musical "The Lion King", since it was one of the activities on the visit. Specifically, we asked them to find out information about the show, so they could make the most of the experience. Fig. 3 shows an image of the experiment.

In both groups, the same methods were used. First, we presented them with a case study, adapted to the educational level and educational needs of the group. Next, they answered an evaluation questionnaire activity. For the university pilot groups, we used the case study shown in Fig. 4, and for the school group the one presented in Fig. 5.

In their approach to the case study, both groups went in two ways. Firstly, they sought the information in a typical way, i.e. the same way they do normally search information (Google, Yahoo, Lycos, etc.). Next, the students used the AINA application to get the information that they had been asked for.

When students used our application, the teacher was responsible for supervising the search strategies used by students, facilitating the change in their approach. Since these experiences have an emphasis on what the student learns and not what the teachers teaches, we sought to create a greater understanding and increased motivation and student participation in the learning process. Fig. 6 shows the questions included in the questionnaire.

IV. Results and Discussion

Results obtained after the empirical study was carried out throw some quite curious and exciting results to light. Around 89% of the students that attended the study found AINA more interesting and easier to use than using an open search with their usual search engine, as the latter required successive searches in specialized databases such as IMDb.com, eldoblaje.com, doblajedisney.com, rottentomatoes.com, Wikipedia, etc., after the first search in a conventional search engine. This figure of 89% is curiously the same number of respondents that expressed a fear of the unknown. Surprisingly, university students showed a higher reticence to change (77%) than students of secondary levels (12%).

It is also worth noting that 30% of the students in secondary education did not properly know what RI software is, whereas almost all of them state that they often use Google to perform searches (see Fig. 7). With regards to university students, 56% of them consider that the use of ICTs in the subject of IR is a waste of time, and they instead center their search for information only in materials provided by their teachers (see Fig. 7), as they state in the other part of Question 3 in the questionnaire.

Regarding the questions related to the use and handling of on-line encyclopedias, dictionaries and digital libraries, results showed a discouraging picture about the behavior of university students regarding IR. 85% of students stated that they have not made use of encyclopedias, dictionaries or digital libraries, and seem to not know what a specialized website is (see Fig. 8). However, surprisingly it turns out that 70% of the students in secondary education knew what a boolean operator is and stated that they have made use of the public library in their city to get connected to the Internet and further that they have visited specialized websites and consulted on-line encyclopedias and/or dictionaries, such as the Gran Enciclopedia Aragonesa [11], to carry out their academic work (such as EducaRed [12]) (see Fig. 8).

Fig. 3 Picture of research done in Las Viñas Secondary School

Solve the following classroom situation by using AINA application:

- Prepare a didactic unit based in the use of **_TWO animated films from Disney_** where you propose the following aims to your students in the first year of primary school:
    o Distinguish Latin American from Peninsular Spanish.
    o Establish the difference (if any) between the music (Disney) in Spanish and English. Learn to use such difference.
    o Reflect about the use of famous voices in dubbing and how it influences the characters.
- Once you have chosen the **_TWO animated films from Disney_**, justify why they are useful to implement such aims and how you would use them.

Fig. 4 Questions used with the students from Teacher Training Degree

ACTIVITY: AINA PROJECT FOR SECONDARY SCHOOL STUDENTS

You are soon going on a school trip to London. There you will enjoy a wonderful musical, The Lion King. Do you know the origins of the story and its production as a film?

- Use a browser in the internet to search for the following information:
    o Its foundation.
    o The type of product it comes from.
    o The type of music and its origin.
    o The actors in the original product (English)
    o Differences between Spanish and English in the original product.
    o Sequels from the original product.
- Once you have done a quick search, try to the same information by using AINA application.

CONCLUSIONS: What did you learn about the musical you are going to see? Answer the questions on the survey.

Fig. 5 Questions used with the students from Secondary School

General Information

1. **Sex:**

   ☐ Male
   ☐ Female

2. **How good are you at computer use?**

   ☐ I don't use it
   ☐ Basic level (text processors and internet)
   ☐ Medium level (install and use several apps)
   ☐ High level (install operational systems)
   ☐ Professional level (programming my own apps)

3. **What RI tools do you use as a rule?**

   ☐ Google
   ☐ Wikipedia
   ☐ Bing
   ☐ Yahoo
   ☐ Ask
   ☐ Others. Which one?_____

4. **When using computer software, are you afraid of new /unknown things?**

   ☐ Yes
   ☐ No

5. **Where do you usually surf the net?**

   ☐ I don't surf the net
   ☐ Home alone
   ☐ Several Places
   ☐ Public Library in _____

6. **How many hours a day do you use the Internet?**

   ☐ Nothing (or less than 30 minutes)
   ☐ Between 30 minutes and 3 hours
   ☐ More than 3 hours

7. **How important are your Internet habits?**

   ☐ Very Important
   ☐ Important
   ☐ Not very important
   ☐ Irrelevant

8. **Order from 1 to 6 (1 for the best, 6 for the least) the topics you search more in the Internet**

   ☐ Mass media
   ☐ Encyclopedias and dictionaries
   ☐ Digital Libraries
   ☐ Shopping and tourism
   ☐ Specialized webs
   ☐ Social Networks

9. **Do you know what a Boolean operator is?**

   ☐ Yes. Give an example: _____
   ☐ No

Analysis of the free search

10. **Mark the level of agreement with the following statements about searching the Web (1-totally agree, 5 completely disagree).**

	1	2	3	4	5
I found the answer at first					
It was very easy to find the required information					
I was very fast at finding the information.					

Use of AINA

11. **Mark the level of agreement with the following statements about searching the Web with AINA (1-totally agree, 5 completely disagree).**

	1	2	3	4	5
I found the answer at first					
It was very easy to find the required information					
I was very fast at finding the information.					
I knew how to use the tool without previous knowledge about it					
The information I found was complete					
The way in which the programme presents the information is clear and easy to understand					
You would like to use this programme everyday					
The use of this application was entertaining					
The application is useful					

General Opinion

	1	2	3	4	5
Opinion about the free search					
Opinion about the search with AINA					

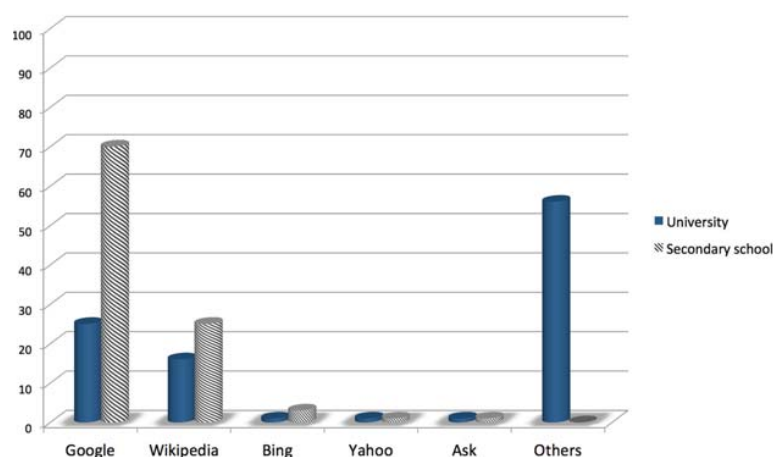Fig. 6 Survey questions for the evaluation of the given activity
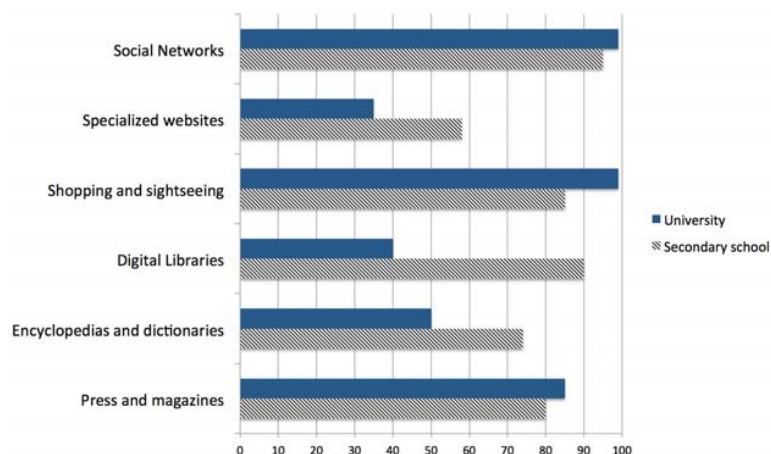

Fig. 7 Web browsers used by students

Fig. 8 Topics commonly searched in the Internet by the students

Finally, it is worth mentioning that there a high percentage of participants (78% of the university students and 72% of students in secondary education) finished the activity and filled out the survey. This, coupled with the low number of errors made during the resolution of the practical case, show the high level of motivation and application of the students towards the proposed tasks. We believe that the JiTT-based learning approach based on the exploitation of computer resources (AINA specifically) can support teaching through the consolidation of the search for animation teaching resources and the IR processes.

V. Conclusions

In this paper, we have PRESENTED AINA, a tool that supports the storage and retrieval of information related to Disney movies, which can then be used as an educational resource in the classroom at different levels and in different educational areas. We have also shown the results of an experimental study in which we have used the tool in both university and secondary education.

The data obtained, talking about the search strategies and RI with academic goals, show that the group of university students does not have a good command of any feature being analyzed. However, students in secondary education have a much greater level of competence in regard to the knowledge of specialized databases and the use of libraries. This may be due to the fact that currently, teachers in secondary school are making greater efforts around the training of their students in the use of ICTs. These students are also those that make more use of Internet when they are asked to carry out an academic work. However, surprisingly the university students' research work was usually centered only on the materials provided by the teachers who are in charge of the subject. This gets justified by the students as a the fear of change as well as because of time constraints caused by the higher workload they face. It also shows how students lack knowledge about the use of on-line services in the library in their University when performing searches and IR, whilst also showing a higher

level of ignorance about specialized websites. We think that these results may be more positive in future studies if we carried out the same study with students of other disciplines, such as Engineering and the Sciences. Nonetheless, we believe it is necessary to strengthen the collaboration between the library staff and teachers in educational institutions in order to improve the students' training about IR.

Regarding the main conclusions that arise from the change of approach in the classroom, we would like to point out that the JiTT approach based on the use of computer resources for teaching:

1) Stimulates the interest of the students prior to sessions through the use of attractive and entertaining tasks.
2) Guides the teachers so that they can restructure the classes in order to make clearer the concepts that are liable to be badly used by students, due to either ignorance or lack of understanding of the IR processes.
3) Can be used by the teacher to get an approximate idea about the profile of the students in the group they are working with, and also about the students specific interest in the subject.

In conclusion, we would like to mention that, since the tool has shown to be of interest, we are currently working on its adaptation across several devices, its translation into several languages, and the inclusion, not only of the section of samples for advanced IR, but also of an integrated search engine for full text that guarantees free use of the educational resources about animation included in AINA.

REFERENCES

[1] J. Tramullas and A. Sánchez, *Scientific information retrieval behavior: A case study in students of Philosophy*. 1er Congreso Español de Recuperación de Información/1st Spanish Conference on Information Retrieval (pp. 251–258). Madrid. Available at: http://hdl.handle.net/10760/14663.

[2] J. Tramullas and P. Garrido, eds., *Library Automation and OPAC 2.0*. Hersey, MA: IGI Global, 2013.

[3] R. Pérez-Rodríguez, L. Anido-Rifón, M. Gómez-Carballa and M. Mouriño-García., *Architecture of a concept-based information retrieval system for educational resources*, IEEE International Symposium on Computers in Education (SIIE), pp. 99-104, 2014.

[4] I. G. López and V. Marín. *El cine y la educación en la etapa de primaria*. Aula de innovación educativa, (153):68–70, 2006.

[5] J. Méndez. *Aprendamos a consumir mensajes*. España, Grupo Comunicar Ediciones, 2001.

[6] M. Muñoz and F. Repullés., *Corpus de traducciones audiovisuales: estudios de casos*. Simposio Tralima: Translation, Literature and Audiovisual Media. Universidad del País Vasco, 2012.

[7] A. D. Gavrin, J. X. Watt, K. Marrs and R. E. Blake., *Just-in-Time Teaching (JiTT): Using the Web to Enhance Classroom Learning*, Computers in Education Journal, vol. 14, no. 2, 2006.

[8] P. Garrido and J. Tramullas (2014)., *Topic Maps. In M. A. Sicilia (Ed.), Handbook of Metadata, Semantics and Ontologies*. Singapore: World Scientific. Available at: http://www.worldscientific.com/worldscibooks/10.1142/7077

[9] L. Johnson, S. Adams, and M. Cummins. *The NMC Horizon Report: 2012 Higher Education Edition*. Technical report, The New Media Consortium and the EDUCAUSE Learning Initiative, Austin, Texas TX, 2012.

[10] Massachusetts Institute of Technology. *The MIT+K12 Project*. 2016. Available at: http://connect.mit.edu/profile/mitk12-project (Accessed 25 June 2016).

[11] Dicom Medios. *La Gran Enciclopedia Aragonesa*. 2016. Available at: http://www.enciclopedia-aragonesa.com/ (Accessed 25 June 2016).

[12] Fundación Telefónica. *Educared: Educación e Innovación para el siglo XXI*. 2016. Available at: http://educared.fundacion.telefonica.com.pe/sites/bibliotecavirtual/ (Accessed 25 June 2016).