



Received: 10-05-2014
Reviewed: 28-05-2014
Accepted: 21-06-2014



RECYT Code: 28937
Preprint: 15-11-2014
Final Publication: 01-01-2015

DOI: 10.3916/C44-2015-07

A Digital Repository of Filmic Content as a Teaching Resource

Un repositorio digital de contenido fílmico como recurso didáctico

Miguel-Ángel Tobías-Martínez

Awardee of the Organization of American States (OAS) in the Master of Science, Management and Information Technology at the Federal University of Paraná (UFPR) (México) (angeltobias@gmail.com).

ORCID 0000-0001-9832-4940

Dr. Maria-do-Carmo Duarte-Freitas

Professor of the Faculty of Applied Science at the Federal University of Paraná (UFPR) (Brazil) (mcf@ufpr.br).

ORCID: 0000-0002-7046-6020

Dr. Avanilde Kemczinski

Professor of the Faculty of Computer Science at State University of Santa Catarina (UDESC) (Brazil) (avanilde.kemczinski@udesc.br).

ORCID: 0000-0001-7671-5457

Abstract

The use of video as a teaching resource stimulates the construction of new knowledge. Although this resource exists in several genres and media, the experience of professionals that use this resource in class is not appreciated. Furthermore, online spaces guiding and supporting the appropriate use of this practice are unavailable. In the online learning field, a proposal has emerged for a repository of short videos aimed at instructing how to use them as a teaching resource in order to stimulate the exchange of ideas and experience (fostering and creating knowledge) in the teaching-learning process, which serves as a resource for professionals in the construction of MOOC (Massive Open Online Courses). A three-stage architecture is methodologically proposed: identification/recognition, dissemination and collaboration in the use of videos as a teaching resource supported by an extensive exploratory research, based on existing educational technologies and technological trends for higher education. And this leads to the creation of a repository of Informational Content Recovery in Videos (RECIF: Recuperação de conteúdo em filmes), a virtual space for the exchange of experience through videos. We conclude that through methodologies that facilitate the development of innovative processes and products, it is possible to create spaces for virtual or face-to-face motivational classes (MOOC) thereby completing an interactive and collaborative learning toward stimulation of creativity and dynamism.

Resumen

El uso de videos como recurso didáctico estimula la construcción de conocimiento nuevo. A pesar de la existencia de este recurso por diversos géneros y medios, no se valoriza la experiencia de profesionales que los aprovechan en clase y además no se cuenta con espacios online que orienten y apoyen el uso apropiado de esta práctica. En el ámbito del aprendizaje o-nline, surge la propuesta de un repositorio de videos de corta duración, con el objetivo de orientar acerca de su uso como recurso didáctico, a fin de incentivar un intercambio de ideas y experiencias (fomentar y crear conocimiento), en el proceso enseñanza-aprendizaje, sirviendo esto como recurso para profesionales en la construcción de los MOOC (Massive Open Online Courses). Metodológicamente se propone una arquitectura en tres etapas: identificación/reconocimiento, disseminación y colaboración, para uso de videos como recurso didáctico, sustentándose en una extensa investigación exploratoria, basándose en las tecnologías educativas existentes y tendencias tecnológicas para la educación superior. Resultando en la creación de un repositorio de Recuperación de Contenido de Información en Videos (RECIF: Recuperação de conteúdo em Filmes), un espacio virtual de intercambio de experiencias por medio de videos. Se concluye que por medio de metodologías que facilitan el desarrollo de procesos y productos innovadores, se pueden crear espacios de clases virtuales o presenciales motivadoras (MOOC), que completen un aprendizaje interactivo y colaborativo, estimulando la creatividad y dinamismo.

Keywords / Palabras clave

Pedagogical practice, animated movie, object learning, distance education, online learning, MOOC, informational content, exchange content.

Prácticas pedagógicas, películas animadas, objetos de aprendizaje, educación a distancia, aprendizaje on-line, MOOC, contenido informacional, intercambio de contenido.

1. Introduction

The globalisation tendency stimulates the creation of space among Higher Education Institutions (HEIs) to promote partnerships with professors, students, courses and research, further fostering innovation in the Information and Communication Technologies (ICTs). The twenty-first century has stimulated in the whole world the creation of collaborative networks as well as federated networks for research and use of these technologies among universities and study centres. According to Dillenbourg and al. (2009), collaboration plays a significant role in knowledge construction. Collaborative learning describes a variety of educational practices in which the interaction among participants is an important factor in the teaching-learning process.

Nowadays, Universities are being reformed due to the incorporation of Information and Communication Technologies (ICTs), particularly as a consequence of the release and development of Internet 2.0 (Cabero & Marín, 2014; Vázquez-Cano & López, 2014). For this reason, we have experienced a revolution of higher education, an activity that will grow and spread globally as in the case of the MOOC phenomenon (Aguaded & al., 2013; Vizoso, 2013).

Distribution of recorded classes and conferences is widespread in Internet; they are disseminated in Platforms such as Massive Open Online Courses (MOOC) (Cormier, 2008; McAuley & al., 2010) for the purpose of exchanging information and knowledge. The latter is an evolution of the conventional educational environments of Distance Education with two significant characteristics: a) massive: meaning courses for thousands and thousands of people; and b) open: integration with social networks. In summary, MOOC have been established as a

progress in the education and training-related areas (Bouchard, 2011; Aguaded & al., 2013). Thus, MOOC can be considered as a progress with technological and social inclinations, especially in the higher education sphere toward stimulation oriented to innovation and promotion of massive, open and interactive learning, that is to say, the genesis of collective research (Vázquez-Cano & al., 2014; Vázquez-Cano & López, 2014).

The offer of different courses for professional training of individuals is aimed at achieving the mission of training new generations toward a critical and creative appropriation of learning, which means teaching to learn how to be a citizen able to use the technologies as a means of participation and expression of one's opinions, knowledge and creativity.

Search for creative interactive and dynamic learning is a reason that motivates teachers to always seek for innovative teaching strategies aimed at attracting attention of students for them to attentively experience their own learning process, the nearest possible to their reality (Eishani & al., 2014). This has led to an initiative to use video as an information strategy, working with all the senses through movement, feeling, text and vision. Videos are part of the so-called digital media dealing with issues and topics, in different forms and styles of messages referring to the main daily issues and situations. Videos, being considered as an informational product, transmit information as text, sound and a succession of images giving the impression of movement. The foregoing aspects of videos are important to create signs, meanings and for development of concepts. The objective is to understand and explain the reality, to create values, desires and fantasies, which constitute subjectivities generated by experiences and expectations.

This study intends to present a digital repository of Informational Content in Video to support, facilitate and gather learning objects for the online teaching-learning process. The project under research is the Platform of Informational Content Recovery in Videos (RECIF in Portuguese), which commenced research in 2007, and the first version of the project was implemented in 2010 by the Research Group on Science, Information and Technology of the Federal University of Paraná. Since its creation, this project consists in identifying and gathering content in Video to be used in the classroom.

2. Use of technology to improve educational practices

During the twenty-first century, schools began incorporating technological resources (Feria & Machuca, 2014) and using them to solve problems during pedagogical practice and in social relations. Since that moment, we can enjoy technological interactivity that motivates professionals to select information and access virtual spaces under a pedagogical and significant perspective oriented to the knowledge exchange culture. Learning through the use of tools that stimulate interactivity, the recreational component could be obtained through online games, networked discussions or forums, virtual research, films, blogs or e-mails, that is, access to virtual learning (Almeida & Freitas, 2012).

Barros (2005) presents a discussion on the use and appropriation of technology by professors in their educational practices, demanding new forms to organise the existing structures or even proposing new ones to better respond to the society's emerging issues.

«In general terms, it is being introduced a currently emerging new educational paradigm, whose pedagogical dynamics is characterised by a need to develop in each student the practice of advanced skills through the adoption of large units of authentic contents linked to the introduction of a multidisciplinary curriculum; the evaluation of achievement and/or performance; an emphasis to collaborative learning; the position of the teacher as a facilitator; the predominance of heterogeneous groups, the student learning, assuming a connotation of dynamic content exploration, and the adoption of interactive teaching modes» (Means, 1993).

By virtue of the insertion of TIC in education, there is a need to conceptually understand what educational technology is. Bueno (1999: 87) conceptualises technology as «a continuous process through which humanity moulds, modifies and generates its quality of life. The human being is in a constant need of creation and interaction with nature by producing from the most primitive to the most modern instruments, using scientific knowledge to apply the technique, modify and improve the products inherent to the process of interaction of the human being with nature and other human beings».

Technology identifies with a type of culture, which is related to the social, political and economic moment. Significance must be ascribed to the improvement of pedagogical practice (MacPhail & Karp, 2013), in the training of professionals. The teacher must understand technology as an instrument that participates in the construction of a democratic society. Video is the technological proposal discussed in this article toward the appropriation of its potential and its use in the planning, development and application of teaching situations occurring in cyberspace: «Over a century ago, the cinema has fascinated and moved people around the world. Among those persons who regularly went, are going or will go to watch a movie in a dark room, teachers and students are certainly included» (Napolitano, 2006).

Napolitano (2006) presents problems in the adaptation and treatment of video as a pedagogical resource, as shown in figure 1, for it is necessary to select the video based on the technical and organisational possibilities of the exhibition, articulation with the content, discussed concepts, general and specific objectives to be achieved. Therefore, the importance of the filmic analysis and semiotics analysis (search for implied meanings) is the video selection. For using this resource, the teacher needs to be organised for selection and schematisation of the scenes addressing the topic of the discipline, time and school work. As a pedagogical strategy, it requires experience from the teacher in the manner of conducting activities according to the public and objective desired in the classroom.

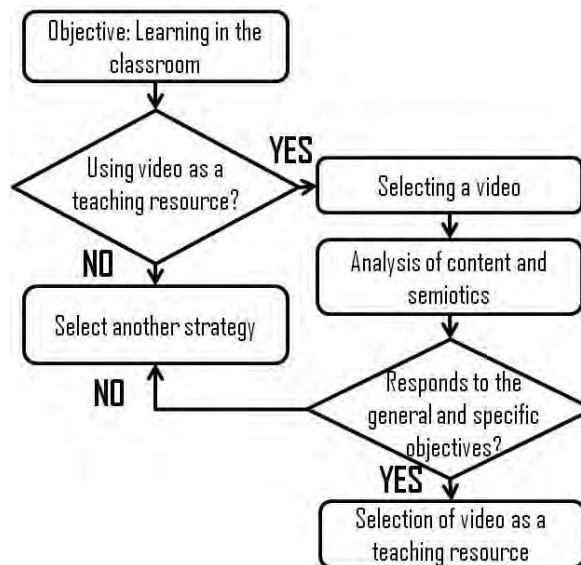


Figure 1. Flowchart showing the selection of a video as a teaching resource, based on Napolitano (2006).

According to Rezende & Abreu (2006), the information becomes «all worked, useful, treated data having an attributed or added significant value with a natural and logical sense for the user of those data». The information is described by Le-Coadic (1996) as knowledge inscribed (engraved) in a written way (printed or numerical), verbal or audio-visual. It is a meaning transmitted to a conscious being through a message inscribed in a space-temporal support: printout, electric signal, sound wave, etc. It is also affirmed that utilising an information product is using such «object» to also obtain an effect that satisfies an information need. This process and connections of data and information are presented in figure 2.

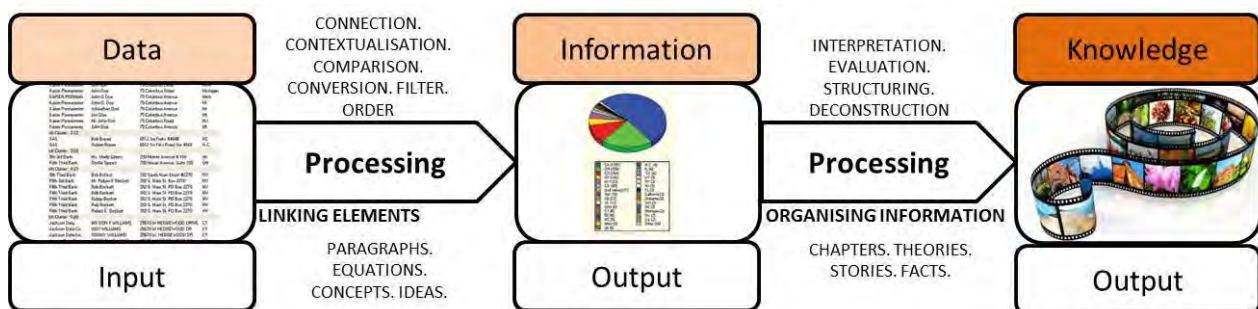


Figure 2. View of RECIF Project under the concepts: data, information and knowledge, based on Abreu (2006) & Le-Coadic (1996).

Teaching with videos requires examining the video content and evaluating its consistency first (figure 2). Consequently, an analysis of semantics and definition of descriptors is required thereby enabling the recovery of information contained in the movie (Chella, 2004). This is also similarly applied to MOOC (Pappano,

2012; Little, 2013) resulting from conferences and classes taught at institutes. The content analysis, along the sequential study of the video, will allow the search and selective recovery of the information specified by the user.

The principle of semiotics implies an object exploration, and this is solely possible when the concepts of reality and truth are related. However, semiotics (Ranker, 2014) does not directly refer to reality it prefers the analysis through signs and texts (Duarte & Barros, 2005:194)

The use of semiotics in learning means to interpret its flow and, based on the lesson, to identify how the meanings are distributed in and between the modes of representation and communication thereby combining innumerable varieties among teaching, learning, interactions and activities. All this occurs through different means located in different dissemination media (Mavers, 2009; Ranker, 2014). It is worth presenting above the repository project and its dimensions for complementary use in teaching activities.

3. Recovery of filmic informational content

Figure 3 above clearly presents this research methodology, which proposes three stages and shows the explored literature, which supports the architecture proposed intended to use the online filmic resources as a teaching resource.

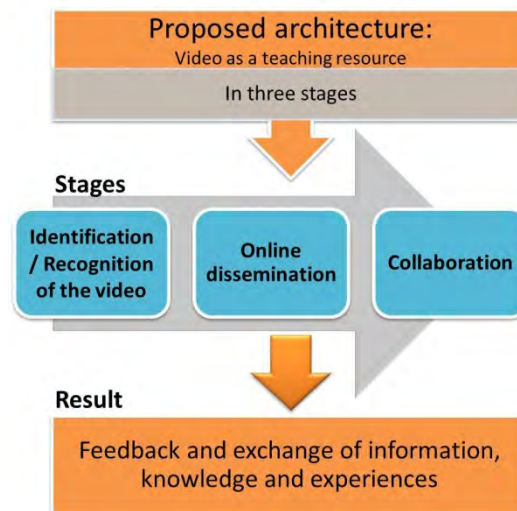


Figure 3. Architecture of methodology proposed.

In the application of the explored literature study, the first RECIF project version was released in 2010, it consisted in an interface with sections on how to use a video as a teaching resource; it was static, and videos were not shown; for this reason, an interaction between the information presented and the observer's opinion was not perceived according to the proposal of this research (figure 4: doi.org/tm6).

Offering free and quality information of open access for any person regardless of the country of location constitute aspects that have attracted great interest on MOOC (Young, 2012; Al-Atabi & DeBoer, 2014) worldwide, besides no enrolment fee for the course is needed (Liyanagunawardena & al., 2013). How this will be achieved in Brazil? Videos examined in the RECIF project are videos of confer-

ences, symposiums, classes and fragments of commercial movies; however, the copyright law permits the teacher to use filmic fragments if intended for teaching practices. Project RECIF freely offers the methodology of use and orientation on the possible specific fragments of scenes for a class with a declared objective of helping in the recreational process of learning a topic.

In RECIF, the use of social networks is emphasised toward consolidation of these learning communities; the platform allows the teacher to share his experience and even comment the application outcome with peers in networks (Facebook, Google+, among others). Collaboration is achieved in the insertion of associates in the use of already renowned technologies (videos) with new ones (open repositories, RECIF).

The new RECIF project interface (goo.gl/th1cMm) released in 2014, intends to implement courses with videos in xMOOC format (figure 4: doi.org/tm6; figure 5: doi.org/tm7).

Besides social networks (Nikou & Bouwman, 2014), people involved in the community may contribute in adding content to exchange information, thematic materials and learning strategies (Méndez-García, 2013).

The first results of this project were presented in two monographs: «Digital media: the role of video as a resource of information in the generation of learning», by Alcides (2009) and «Model proposal for recovery of informational content in movies» by Santos (2009). Subsequently, it was implemented just as a platform by means of start-up scientific and technological studies. It should now be prepared to belong to a federated network, which motivates the breadth of this study.

4. RECIF Project and its dimensions

This study includes a proposal for its application in an information system structure gathering film clips. Once these are selected, they are to be used as a teaching-pedagogical strategy to generate learning on a topic. Figure 6 shows this study in the point of view of the information science field.

Figure 6 serves to sustain the use of video as a teaching resource in the classroom and, if compared with figure 2, a relationship of the RECIF Project with the «data-information-knowledge» structure can be observed. And in accordance with figure 6, considering the «video» resource as a strategy in the classroom (table 1: doi.org/tm8) is made to illustrate the information presented for it to be understood and assimilated in this project.

Table 1 provides an analysis conducted on the RECIF project according to information analysis flow proposed by Baptista and al. (2010: 77), as seen in figure 6. The following subsections will analyse the dimensions of RECIF project regarding its characteristics, both: Operational and Strategic.

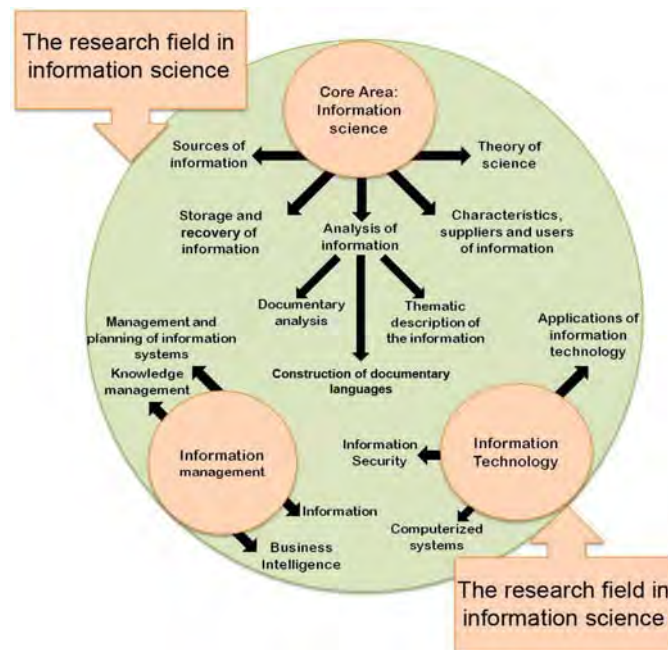


Figure 6. Analysis of information in the context of the RECIF research (Baptista & al., 2010: 77).

4.1. RECIF Project Operational Dimension

RECIF project is a learning tool (Kassim & al., 2014) developed to help teachers to make classes dynamic. It involves a databank with descriptions of film fragments that can be used as a teaching resource by teachers who seek to improve the recreational character of their classes through practical examples or, analogies (Santos: 2009). The ways to exchange knowledge through digital media and also the learning theories (Sitti & al., 2013) are constantly transformed. Galan (2003) affirms that online learning is a profession whose own name is unknown (for suffering from an identity crisis) or a thing that becomes something new and better (table 2 doi.org/tm9) summarises the five realities that modify the learning concept, these precepts are confirmed by several authors, among others (Rosenberg, 2005: 5).

Based on the above statement, the RECIF project intends to cover these questions; therefore, it can: filter, catalogue, add, merge and integrate, in an intelligent, reliable and solid manner, movie scenes from different sources of heterogeneous character found at internet. This type of content shall provide a message, analogy or example for learning a discipline.

Rosenberg (2005) confirms that two ways of online learning; online entertainment and knowledge management (Badpa & al., 2013; Ooi, 2014), as a group, can offer better results. The following step is to unite those dimensions with the traditional approaches of learning in the classroom toward a construction of a complete architecture of learning based on technology.

4.2. Conceptual dimension of RECIF Project

According to Teixeira (1995), the distinction between real and imagined experience «define» us as individuals producing words, senses and meanings. Individuals of time, culture and communication; individuals creating signs, meanings and preparing concepts, seeking to understand and explain the reality in which they live, by creating values, desires and fantasies. This forms the subjectivity of individuals and generates their own experiences and expectations. Based on the above, the RECIF project has been designed for the individual to create knowledge and, at the same time, share that knowledge in the interface.

In the process of conceptual analysis, the RECIF project deals with concepts, definitions, hierarchies and typologies of information. RECIF is a system that summarises the main information of videos so they can be subsequently used as a teaching resource. RECIF intends to make the information available to users with a focus in education. The purpose is to stimulate and facilitate the use of films as a teaching resource by providing the interested party with motivation and interaction in the learning process.

Use of RECIF project is proposed to cause students to search for information by providing a non-linear learning, but composed of concepts, reflexions and analysis. The use of this resource intends to assist the teacher with time and work for what has been taught at the class may be made available in Internet for consultation out of the classroom environment although it can be used again as reinforcement in class.

The basis of filmic recovery through content consists in identifying metadata that satisfy the needs of the user. For this reason, the basis of this research is the analysis of informational content in filmic scenes toward its accessibility as digital repository. Figure 7 is an adaptation to represent the descriptors of the content management process inherent to the RECIF Platform (Santos, 2009)

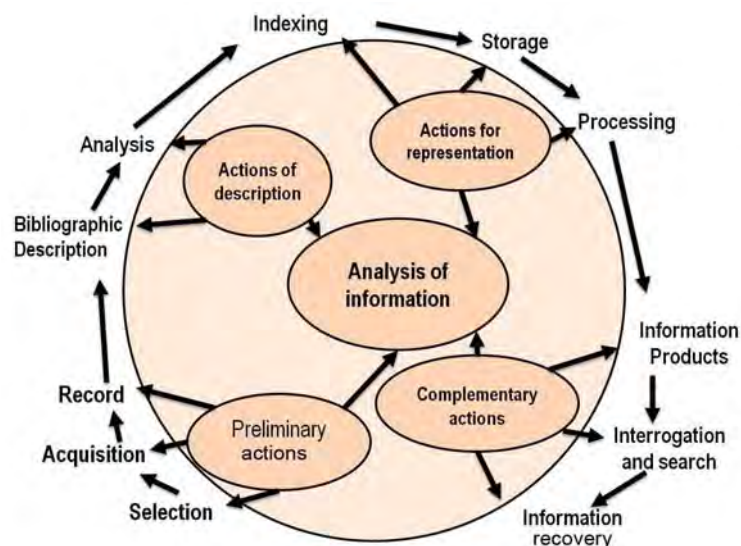


Figure 7. Analysis of information in the context of the information sciences research. (Based on Baptista & al., 2010: 72).

Figure 7 describes the content management process in the RECIF Project; there are four actions to be taken for information analysis: description; representation, preliminary and complementary actions; we can start from any of them according to the topic we want to find or catalogue, related examples:

- If we lack a video for a specific class, based on figure 7, we will identify the action area; and we then note that we must commence from the «preliminary actions» and, in this manner, we will commence searching a video appropriate for the selected topic; and we can pass from this action analysis area to the next ones, according to figure 7 proposed by the authors.
- If we have a video, but we ignore how it must be catalogued, then, we take the «creation actions» by making an analysis of the video, and then, we continue to the «representation actions» area, and we index the content found.

Six theories were proposed in the technology field (table 3: doi.org/tnb) over the last years. And from the traditional learning theories presented in table 4 (doi.org/tnc), it could be said that the RECIF project is mainly focused in the theories of the humanistic teaching approaches, that is, the significant learning (the same line of e-learning). In the same manner, significant learning provides relevance to the internal learning variables of each individual and human conduct is considered as a whole. This can be reflected in the RECIF project for the resources are made available and found according to the needs of the Platform users.

For Texeira and al. (2014), the principal learning theories are divided according to the main learning needs: Associationist and Mediational (table 4).

Implementation of the RECIF project is focused on the type of associationist theories for they mainly seek the reasoning of the individual (the project objective), either an experience or learning through the filmic scenes provided.

4.3. Strategic dimension of RECIF Project

Spaces in the twenty-first century for exchanging research and materials applied to education fostered the development of repositories of the most different fields for Learning Objects, most of which are available for free.

However, diversification of information is small, especially when evaluating the contents and objects intended for higher education. Given the need to extend opportunities among researchers of this topic, virtual spaces should be identified (Hernández & al., 2014) for exchange of experience and innovation, applicable to higher education based on technologies thereby obtaining an interactive and collaborative learning tool (Leinonen & Durall, 2014).

Information analysis with an emphasis in the strategic dimension has been applied in security issues in the content shared with facility and access to federated platforms with a sole identity and the extension of use of the learning objects developed. Dissemination of federated content implies different safety questions; for this reason, one must belong to web sites of reliable federated content.

The idea of dissemination of projects such as RECIF, as a product, is intended to improve and implant the platform to share experience.

The concept is based on three fundamental ideas:

- It is based on federated (interconnected) networks.
- The dissemination takes place through Internet technology in a computer focused on the user.
- The approach is learning, in the widest sense.

Use of Internet allows the up-dating, dissemination and virtually instantaneous distribution of the information. It is noted that people have less and less time to learn; and for this reason they need to learn at a faster rate. And the digital repositories, such as the RECIF project, offer to the end user the means to learn rapidly and to share at the same time. Future perspectives are for spaces to become collaborative with a possibility of connection with other associated institutions in any part of the world; in this manner a filmic base is offered for the use of practices in the classroom for higher education.

5. Final considerations

As it has been expressed at the beginning of this research, it is concluded that the expected result, that is, sharing of knowledge, information and experience among the users of the proposed architecture, is achieved by means of the identification of the correct material concurrently with its online distribution. In this manner, when video is used, youngsters reflect on the reality experienced and express themselves through language, by handling the signs presented in the selected video and processing information. In the semiotics process, information is used to make generalisations and suppositions. Teachers relate the theory to be transmitted to an analogy through video and the aspects observed in each student as for existences (facts, ideas and sensitivities) which, when been assimilated, generate information and individual knowledge.

New technologies provide applications that create, when used in school learning, a new model of materials for the teaching-learning process. Features provided in federated platforms can work as a «class after a class» in a virtual space where students and teacher get in contact. They also provide a new sense to teaching resources. Federated platforms offer an exchange of opinions where students and teachers can also create their own space related to educational topics. Web sites such as Youtube may help in sharing information taught in class and the opinions of teachers or students on a topic.

This work is intended to present the RECIF project and make it available in a Federated System, which possesses filmic informational content with pedagogical objectives. The project demands an analysis of filmic scenes along with semiotics for extraction of information and implied meanings, and the subsequent organization of that knowledge. In accordance with the proposal in the objective of this work, it was possible to explore the theories implied in the RECIF project, and show how the analysis of its information is conducted in a federated platform intended to recover informational content suitable for learning purposes.

Techniques used for information and knowledge organisation were investigated in the RECIF project (filmic scene as an informational product), content object and the use of video as a digital repository. The project operation was specifically described along with its operational and conceptual scopes. A description was made on how to conduct an information analysis including its relationship with the

learning theories that support the project as a method that well managed could become an effective learning tool.

In this study, it is noted that the teaching-learning process is effective when well managed by technological tools, in the special case of federated platforms, offering special resources in the teaching field to contribute to the development of the knowledge of the user, either student or teacher. Therefore, it can also create knowledge by fostering learning in class.

Online technologies, for being used as tools of constructivist knowledge, create an experience on traditional learning, which results to be different in the teaching-learning process, with better results among students. For they stimulate their way of learning; therefore, they learn better and construct their own knowledge.

For this reason, this research contributes with the proposal of an architecture that stimulates teachers, students and researchers in the recovery/collaboration of learning objects. Besides, it can be implemented at a low cost because of its freeware application.

References

- Alcides, R. (2009). *Mídia digital: o papel do filme de animação como recurso de informação na geração da aprendizagem*. Trabalho de Conclusão de Curso, UFPR, Curitiba. (goo.gl/Qfqy8Y) (10-07-2014).
- Aguaded, I., Vázquez-Cano, E. & Sevillano, M.L. (2013). MOOC, ¿turbocapitalismo de redes o altruismo educativo? En *Scopeo Informe*, 2: MOOC: Estado de la situación actual, posibilidades, retos y futuro. (pp. 74-90). Salamanca: Universidad de Salamanca Servicio de Innovación y Producción Digital. (goo.gl/slqguU) (22-06-2014).
- Almeida, M.G. & Freitas, M.C.D. (Org.). (2012). *A Escola no Século XXI*, 2: Docentes e Discentes na Sociedade da Informação. Rio de Janeiro: Brasport.
- Al-Atabi, M. & DeBoer, J. (2014). Teaching Entrepreneurship Using Massive Open Online Course (MOOC). *Technovation*, 34, 4, 261-264. (doi.org/tmk).
- Badpa, A., Yavar, B., Shakiba, M. & Singh M.J. (2013). Effects of Knowledge Management System in Disaster Management through RFID Technology Realization. *Procedia Technology*, 11, 785-793. (doi.org/tmm).
- Baptista, D.M., Araújo JR., R.H. & Carlan, E. (2010). O escopo da análise de informação. In: J. Robredo, M.J. Bräscher & M. Bräscher (Orgs.), *Passeios no bosque da informação: estudos sobre representação e organização do informação e do conhecimento*. Brasília DF: IBICIT. (goo.gl/kt4X56) (02-01-2014).
- Bouchard, P. (2011). Network Promises and their Implications. In *The Impact of Social Networks on Teaching and Learning*. *RUSC*, 8(1), 288-302. (goo.gl/Y7TSZK) (23-06-2014).
- Belloni, M.L. (1998). Tecnologia e formação de professores: rumo a uma pedagogia pós-moderna? *Educação e Sociedade*, 19: 65; 143-162. (doi.org/d38f7q).
- Bévort, E. & Belloni, M. (2009). Mídia-educação: conceitos, história e perspectivas. *Educación Social*, 30, 109; 1081-1102. (doi.org/fw7jm7).
- Barros, N.V. (2005). *Curso: Capacitação para Conselhos Tutelares (Projeto SIPIA) ministrado na Faculdade de Administração-Niterói /UFF*.
- Bueno, N.L. (1999). *O desafio da formação do educador para o ensino fundamental no contexto da educação tecnológica*. Curitiba: Dissertação de Mestrado, PPGTE-CEFET/PR.
- Cabero, J. & Marín, V. (2014). Posibilidades educativas de las redes sociales y el trabajo en grupo. Percepciones de los alumnos universitarios. *Comunicar*, 42, 165-172. (doi.org/tmt).

- Cormier, D. (2008). The CCK08 MOOC - Connectivism course, 1/4 way. Dave's Educational Blog. (goo.gl/tskvev) (22-06-2014).
- Chella, M.T. (2004). Sistema para Classificação e Recuperação de Conteúdo Multimídia Baseado no Padrão MPEG, 7. São Paulo: UNICAMP.
- Davies, D., Jindal-Snape, D., Collier, C., Digby, R., Hay, P. & Howe, A. (2013). Creative Learning Environments in Education: A Systematic Literature Review. *Thinking Skills and Creativity*, 8, 80-91 (doi.org/tmn).
- Dillenbourg, P., Järvelä, S.Y. & Fischer, F. (2009). The Evolution of Research on Computer-supported Collaborative Learning. In *Technology-enhanced Learning*, Springer Netherlands, 3-19.
- Duarte, J. & Barros, A. (Eds.) (2005). Métodos e técnicas de pesquisa em comunicação. IASBECK, Luiz Carlos Assis. São Paulo: Atlas.
- Eishani, K.A., Saa'd, E.A. & Nami, Y. (2014). The Relationship between Learning Styles and Creativity. *Procedia. Social and Behavioral Sciences*, 114, 52-55 (doi.org/tms).
- Feria, L.B. & Machuca, P. (2014). The Digital Library of Iberoamerica and the Caribbean: Humanizing Technological Resources. *The International Information & Library Review*, 36:3: 177-183 (doi.org/cc4p57).
- Galagan, P. (2003). The Future of the Profession Formerly known as Training. *T&D Magazine*, 57, 12, 26-38.
- Hernández, N., González, M. & Muñoz, P.C. (2014). La planificación del aprendizaje colaborativo en entornos virtuales. *Comunicar*, 42, 25-33. (doi.org/tmp).
- Leinonen, T. & Durall, E. (2014). Pensamiento de diseño y aprendizaje colaborativo. *Comunicar*, 42, 107-116. (doi.org/tmq).
- Kassim, H., Nicholas, H. & Ng, W. (2014). Using a Multimedia Learning Tool to Improve Creative Performance. *Thinking Skills and Creativity*, 13:9-19 (doi.org/tmr).
- Le-Coadic, Y.F. (1996). A ciência da informação. Brasília, DF: Briquet de Lemos.
- Little, G. (2013). Massively Open? *The Journal of Academic Librarianship*, 39, 3, 308-309. (doi.org/tmv).
- Liyanagunawardena, T., Adams, A. & Williams, S. (2013). MOOC: A Systematic Study of the Published Literature 2008-12. *International Review of Research in Open and Distance Learning*, 14(3), 202-227. (doi.org/tmw).
- McAuley, A., Stewart, B., Siemens, G. & Cormier, D. (2010). The MOOC Model for Digital Practice. (goo.gl/ljmvEl) (23-06-2014).
- MacPhail, A., Tannehill, D. & Karp, G.G. (2013). Preparing Physical Education Preservice Teachers to Design Instructionally Aligned Lessons through Constructivist Pedagogical Practices. *Teaching and Teacher Education*, 33: 100-112. (doi.org/tmx).
- Mavers, D. (2009). Student Text-making as Semiotic Work. *Journal of Early Childhood Literacy*, 9, 2, 141-155. (doi.org/bwbn34).
- Means, B. (1993). Using Technology to Support Education Reform. Education Development Corporation. U.S. Department of Education. September. (goo.gl/SQ9uaa) (30-04-2014).
- Méndez García, C. (2013). Diseño e implementación de cursos abiertos masivos en línea (MOOC): expectativas y consideraciones prácticas. *RED*, 39, 1-19. (goo.gl/pHHweM) (11-07-2014).
- Napolitano, M. (2006). Como usar o cinema na sala de aula. 4. Ed. São Paulo: Contexto.
- Nikou, S. & Bouwman, H. (2014). Ubiquitous Use of Mobile Social Network Services. *Telematics and Informatics*, 31, 3, 422-433 (doi.org/tmz).
- Ooi, Keng-Boon. (2014). TQM: A Facilitator to Enhance Knowledge Management? A Structural Analysis. *Expert Systems with Applications*, 41, 11, 5167-5179. (doi.org/tm2).

- Pappano, L. (2012). The year of the MOOC. *The New York Times*. (goo.gl/3P2yPG) (22-06-2014).
- Ranker, J. (2014). The Emergence of Semiotic Resource Complexes in the Composing Processes of Young Students in a Literacy Classroom Context. *Linguistics and Education*, 25, 129-144. (doi.org/tm3).
- Rezende, D.A. & Abreu, A.F. (2006). *Tecnologia da informação aplicada a sistemas de informação empresarial: o papel estratégico da informação e dos sistemas de informação nas empresas*. São Paulo: Atlas.
- Rosenberg, M.J. (2005). *Beyond e-Learning: Approaches and Technologies to Enhance Organizational Knowledge, Learning and Performance*. San Francisco: Pfeiffer.
- Santos L.R.N. (2009). *Proposta de modelagem para recuperação de conteúdo informacional em filmes*. Monografia de conclusão de curso em Gestão da Informação. Curitiba: UFPR. (goo.gl/Pa4PZk) (10-07-2014).
- Siemens, G. (2004). Connectivism: A Learning Theory for the Digital Age. *International Journal of Instructional Technology and Distance Learning*. (goo.gl/KJapGA) (14-04-2014).
- Sitti, S., Sopeerak, S. & Sompong, N. (2013). Development of Instructional Model Based on Connectivism Learning Theory to Enhance Problem-solving Skill in ICT for Daily Life of Higher Education Students. *Procedia, Social and Behavioral Sciences*, 103, 315-322. (doi.org/tm5).
- Teixeira, A., Ferreira, E. & Sousa, E. (2014). *Preparatório para o concurso da SEMED*. Secretaria Municipal de Educação. , Brasil: Governo do Manaus.
- Teixeira, C.E.J. (1995). *A Ludicidade na Escola*. São Paulo: Loyola.
- Vizoso, C.M (2013). ¿Serán los COMA (MOOC), el futuro del e-learning y el punto de inflexión del sistema educativo actual? *Boletín SCOPEO*, 79. (goo.gl/NjoLRA) (22-06-2014).
- Vázquez-Cano, E., Sirignano, F., López M.E. & Román, P. (2014). La globalización del conocimiento: Los MOOC y sus recursos. *II Congreso Virtual Internacional sobre Innovación Pedagógica y Praxis Educativa*. Sevilla, 26-28 de marzo.
- Vázquez-Cano, E. & López, M.E. (2014). Los MOOC y la educación superior: la expansión del conocimiento. *Profesorado*, 18, 1, 1-10.
- Young, J. (2012). Inside the Coursera Contract: How an Upstart Company Might Profit from Free Courses. *The Chronicle of Higher Education*. (goo.gl/xxkd5S) (22-06-2014).