

# Open learning resources as an opportunity for the teachers of the Net Generation

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## Abstract

*In this paper we illustrate a solution to reduce the gap between teachers and the Net Generation. In the framework of an European funded project called Tenegen, based on a former project called Sloop, we encourage teachers to produce, share, comment, tag and modify Open Learning Objects, as their students are used to do on the Net with different types of information. In such a way, teachers are involved in network social activities, use Web 2.0 tools, and their learning objects are the examples of application of collective intelligence. To sum up, teachers emulate their students' learning behavior.*

**Keywords:** Open Learning Objects, Open Educational Resource, Net Generation, Connectivism, Web 2.0

## 1 Introduction

During the last 5 years, the number of repositories of digital educational contents has rapidly increased, as a consequence of the diffusion of e-learning methodologies and solutions in schools. Despite this, the number of teachers using, producing and sharing digital contents is still low. The adoption of the Learning Object (LO) paradigm as the main model for the content in most of the Learning Management Systems set up in schools has not facilitated the use of digital contents by teachers. Actually, the technical standards behind the LO model (e.g. SCORM) represents one of the main obstacles to the adoption of the LO model by teachers, together with the initial lack of software packages that could simplify the creation of SCORM compliant LOs. Consequently, for many years the production of educational materials for e-learning has been demanded to the digital content providers and developers, usually cooperating with traditional editors, thus compromising one of the principles of e-learning 2.0: the possibility for a community of teachers to produce and share their own materials.

In order to support teachers in the production and sharing of their educational material, in 2005 we started a European funded project called SLOOP: Sharing Learning Object in an Open Perspective (Masseroni and Ravotto 2005). Two of the main results of the project were an extension of the Learning Object model, called OpenLO, and the concept of a new category of software tools called Learning Object Management Systems

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(LOMS), which extends the typical functionalities of a Learning Object Repository, providing users with tools to collaboratively produce learning resources. In Sloop, we developed a first example of LOMS, called FreeLOms; by hiding technical aspects and guaranteeing compatibility with standards in a transparent way, FreeLOms allows teachers to concentrate on the content to be developed.

During the 2 years of the project, some important concepts emerged in the Educational Technologies field: a different use and interpretation of the Web, called the Web 2.0 paradigm (O'Reilly, 2005); the existence of a new generation of students, referred to as Digital Natives (Prensky, 2001) and Generation Y (McCordle, 2006), or generally defined as Net Generation; the need and opportunity of Open Educational Resource (OER) models (Atkins et al., 2007; OECD, 2007; OLCOS, 2007). Some of these concepts had been defined some years earlier, but during the last 3-4 years they have become argument of discussion in the schools.

The Sloop project coped with most of these concepts: the OpenLO model as an application of the more general OER paradigm; the social ties amongst teachers as fundamental elements to elaborate educational materials in a cooperative way; the produced LOs as the result of collective intelligence. The involvement of the Net Generation, even if not part of the project activities, was one of the future activities that emerged during the project: *“A future development - SLOOP 2.0 and freeLOms 2.0 – could directly involve young people, the digital natives [...] a student instead of tagging only photos and videos and downloading music would tag didactic resources adding her/his personal tag to those of the teacher; that a student would access resources not because of the teacher's instructions but because other students has tagged them as useful.”* (Ravotto, Fulantelli, 2007).

In 2008 we have had the opportunity to cooperate to a new European funded project called Tenegen: Connect the TEachers to reach and teach the NEt GENeration, explicitly aimed at reducing the gap between teachers and the Net Generation. The OpenLO concept is being transferred to the Tenegen project with the objective to encourage teachers to participate in the production of a shared resource, which will be commented, tagged and modified by other users of the Net. In other words, teachers will behave as the Net Generation usually does. Specifically to the Tenegen project, the shared resources will be Open Learning Objects, and FreeLOms will be part of the platform that will support the social network learning activities.

## **2 The Sloop project and its main results**

The 2-year Sloop project, run from September 2005 till September 2007, involved 10 partners from 5 countries (Italy, Ireland, Romania, Slovenia, Spain), and was promoted and coordinated by ITSOS Marie Curie, Italy. Following the successful stories of the free software/opensource movement, the main objective of the project was the development of free educational resources accessible from everyone and open to external contributions.

The Learning Object model was adopted as the paradigm for the digital contents to be produced by teachers. Even though there were several reasons to follow the wiki-way solution, specific considerations convinced us to adopt a more formal model:

- the standards behind the Learning Object model guarantee accessibility, reusability and interoperability that are central concepts in the SLOOP project.
- an approach based on LOs does not limit the digital formats used to develop content, this is different to Wiki where there are some limitations; a solution which does not preclude the possibility to transform any digital content into didactic material fits better with the fundamental ideas of the SLOOP project, i.e. the sharing of digital content which exists already on thousands of computers all over the world. For example, a power-point presentation need a re-engineering work to be adapted to the wiki environment, while the same presentation can easily fit into the LO model and maintain its main characteristics.
- the methods used to search for didactic resources based on the wiki model, up until recently, are usually based on free text search. This places considerable limitations on the identification of didactic resources made up of more wiki pages with hypertextual links. The LO model overcomes this problem by an ad hoc standard which allows all the resources to be described in a formal way, such as the IEEE LOM (IEEE, 2002);
- finally compliance with the SCORM standard (ADL 2004), which is widespread in the LO world, is mandatory in Italy for organisations supplying distance learning courses at a university level.

Nevertheless, we also took into account the main criticisms that had put in doubt the pedagogical value of LOs: the difficulty to practically guarantee re-usability and the technical difficulties connected to standards in the production of LOs. In order to overcome these limitations, we have defined the Open Learning Object model (OpenLO): *Starting from Wiley's definition of learning object (Wiley 2000) we define open learning object as "any open digital resource that can be reused to support learning". In this definition the term open indicates open content, namely content developed in open format (e.g. Open Document) or content in closed format whose source files are also available (e.g. Adobe Flash). In addition it refers to open licenses (e.g. Creative Commons) thus allowing users to freely modify and reuse learning objects.* (Fulantelli et al., 2007)

Our vision of reusability is not simply based on combining LOs but goes beyond this towards a pedagogical concept of reusability in which a LO can evolve to meet specific educational requirements. The OpenLO model allows users to edit LOs created by different authors, and customize the LOs according to their own pedagogical needs; in addition, communities of educational professionals can work on the same LO and contribute to its collaborative evolution at content level. Finally, the replication of this process of adaptation of LOs at content level over time is a mechanism that can provide pedagogical sustainability of the LOs.

In the implementation of the OpenLO model, and in the definition of educational methodologies based on this model, it is relevant to focus on three main aspects: 1) changing the life cycle of Learning Objects and consequently the methodologies for producing these resources; 2) assigning a dynamic role to metadata, which should evolve in parallel with the life of the learning object. 3) moving from current Learning Object Repositories (LOR) to innovative Learning Object Management Systems (LOMS). To the aim of this paper, we focus on the third aspect. In-depth discussions on the other aspects can be found in (Fulantelli et al., 2008).

According to the report on Free and Open Source Software (FOSS) for Open Educational Resources (VV.AA., 2006), the traditional tools to manage the elaboration of LOs can be divided into: authoring tools, tools to implement learning technology standards, learning object repositories, learning management systems, collaborative environments for sharing LOs. A teacher wishing to develop a LO needs to have all the skills required for using different tools to handle the LOs in the different phases. This represents a major obstacle for teachers in adopting the LO paradigm. In addition, these tools are not suitable for managing the evolution of LOs and controlling the dynamics introduced by the new OpenLO model.

For this reason it is essential to design a new kind of environment which can manage LOs throughout their entire lifecycle. This kind of platform, that we call Learning Object Management System (Gentile et al., 2006), allows teachers and experts to create a network where they can participate collaboratively in the processes of design, development, sharing, reusing and evaluation of open learning resources through a typical Web 2.0 approach. In our vision, a LOMS is a Rich Internet Application; at the same time a LOMS can be seen as a set of services accessible through the Web from different applications. The goal is to make it easy to use the services provided by a LOMS, and not to impose specific software, but rather to propose a philosophy that makes the creation, management and reuse of digital educational resources efficient and effective.

In the framework of the Sloop project, we have developed a specific LOMS, called FreeLOms. In order to manage learning objects created in a variety of digital formats and provide users with tools to support collaborative activities, FreeLOms has been designed by means of an abstract model of the contents which is able to manage different formats of learning materials, thus facilitating sharing, retrieving and reusing of LOs. FreeLOms includes functionalities for:

- uploading digital educational resources into a repository (LOs in SCORM terminology: Assets, SCOs or Content Aggregations);
- editing LO IEEE Metadata (IEEE 2002); editing of metadata can occur at any stage of the LO lifecycle, and not only when it is uploaded into the platform;
- searching LOs shared by the users; specialized and personalized searches can also be defined (these features meet the needs of authors who usually apply the same search criteria, e.g. to search some specific topics for their discipline);
- managing existing LOs in SCORM vision, by allowing users to edit Assets, SCOs and Content Aggregations (CAs);
- creating Content Aggregations by using the resources available in the repository;
- managing the changes made to the didactic contents through versioning and differencing, both at metadata and content levels (more precisely, these features will make it possible to handle the contributions supplied by each user on the same LO, thus guaranteeing the “collaborative evolution” of LOs);
- transforming digital contents developed in technical formats unsuitable for learning platforms, into contents compliant with the SCORM standards; this functions is limited to some formats
- communicating asynchronously and/or synchronously with other users in order to support group processes; this reflects the typical functionalities available in a Computer

Supported Collaborative Work system, providing an efficient environment for the collaborative management of didactic resources.

The Sloop project and the FreeLOms platform have been successfully evaluated both by the community of teachers grown around the project, and from the official evaluator of the EC Agency (grade: 9/10).

### **3 The Tenegen project: main objectives**

Tenegen is a 2 year project, involving 11 partners from five countries (Hungary, Germany, Italy, Turkey, United Kingdom), promoted and coordinated by Prompt-G Educational Centre for Informatics, Hungary.

The project will valorize the results of two earlier LdV projects: SLOOP and NETIS (<http://www.ittk.hu/netis/index.html>). NETIS provides the philosophical, sociological, and pedagogical basis to support new paradigms of teaching and learning in the Information Society. The aim of Tenegen project is to establish an European environment of connectivism (Siemens, 2005) for VET teachers and trainers, to show the significant advantages of being connected to the Net generation instead of simply delivering knowledge through virtual classrooms and Learning Management Systems ([www.tenegen.eu](http://www.tenegen.eu)).

The main objectives of the project are:

- to elaborate a pedagogical model of network learning and connectivism;
- to develop an online repository of Open Learning Objects;
- to develop a TENEGEN network learning environment based on open source LMS;
- to elaborate and implement five training modules in three languages (HU, EN, TR);
- to establish pilot training courses for teachers and trainers;
- to validate and verify the results in VET schools;
- to disseminate the results all over Europe.

The project intends to deliver the new paradigm of network learning to the teachers and trainers in the vocational education, to help them “to reach and teach the Net Generation”.

### **4 The OpenLO model and FreeLOMS in the Tenegen context**

One of the most interesting challenges we have to face in the Tenegen project is how to train teachers from traditional schools on new pedagogies for the Net Generation, by using a distance course. In fact, we are talking of 3 different educational models to be handled: learning in traditional schools, that have their roots in the first decades of the XX century, mainly teacher-driven learning; informal and self-directed learning, typical of young people who were born almost 1 century after traditional schools; and distance learning, which is not organized and managed as a school course, either as a strongly informal and social space where learning is self-organized and directly controlled by the learners.

Accordingly, the original challenge becomes: how to make transitions amongst the 3 models smooth. The answer is through the distance course that will be organized in

Tenegen. Most of the attempts worldwide to reduce the gap between teachers and the Net Generation focus on the learning needs and attitudes of young students, and tend to train teachers on the pedagogical models that best suit young students and on the ICT tools used by them.

This is an extremely important part of the whole process, and it is one of the main goals of the Tenegen project as well. However, very few experiences focus on the learning needs of the teachers, which are as important as the teaching skills targeted by most of the research projects. How can we support teachers to speak the same language - in Prensky's vision (Prensky, 2001) - as their students? We could organize a traditional course, maybe in the school lab; or we could invite teachers to join a social network, and try to stimulate learning through dialogue and personal interests. Both these methods will encourage learning and produce some knowledge. But do these methods suit learning needs and attitudes of teachers used to teach in a traditional classroom?

The solution adopted in Tenegen is to introduce VET teachers and trainers to the new pedagogies and tools gradually, through a distance course based on Moodle and FreeLOms, where they can still find their cultural and social references (teachers, educational resources, learning objectives to achieve, learning outcomes to produce, and so on), and at the same time to make them to experience the new pedagogical models, to use the new ICT tools and to establish social ties aimed at developing Open Learning Objects. In such a way, transitions between the different pedagogical models will be smooth enough to allow teachers to get closer to the Net Generation learning behaviors.

Specifically to the transfer of the FreeLOms platform, the new version reviewed according to the Tenegen needs, will be called the TenLOs system. As mentioned before, the TenLOs system aims at two distinct aspects: providing the Tenegen partners and the teachers involved in the project with a repository of digital learning resources; secondly, providing teachers with a tool that can allow them to cooperatively develop learning objects. The second aspect represents one of the strategic aims of the Tenegen project, consisting in the fostering of significant collaboration processes between the teachers through the Net. Online social networking mechanisms amongst students are usual: quite often, students activate informal learning processes and develop knowledge implicitly through these networks. By using the TenLOs system to cooperatively develop and share open learning objects, we provide teachers and trainers in Tenegen with an example of net-tool that can be used to develop knowledge (as digital learning resources) in a network. In this case, knowledge is produced in an explicit way.

## 5 Conclusions

Last June, Italian students at their final year of high school were asked to write an essay concerning Social Networks, Internet and New Media, based on some excerpts from different authors, including Castells and De Kerckhove. This topic received a very positive feedback by the students. However, this raised an interesting debate in Italy, around the question if Italian teachers, and in general teachers in traditional schools worldwide, can properly evaluate and assess the thoughts expressed by the students. The debate reflects a real problem in the traditional educational system: teacher competences need to be renewed in order to reduce the gap between them and their students.

Teacher education and training is at the top of the European policy agenda (European Commission, 2008), and similar interest can be found worldwide. Nevertheless, each initiative aimed at improving teacher competences should take into account teacher resistance to change: informal and non-formal learning; self-directed learning; collective intelligence are examples of concepts which are popular in the web 2.0 conception, typical of the Net Generation, but hardly accepted by teachers working in traditional contexts.

In this paper we have illustrated a solution to reduce the gap between teachers and their students, In the framework of an European funded project called Tenegen, based on a former project called Sloop, we encourage teachers to produce, share, comment, tag and modify Open Learning Objects, as their students are used to do on the Net with different types of information. In such a way, teachers are involved in network social activities, use Web 2.0 tools, and their learning objects are the examples of application of collective intelligence. To sum up, teachers emulate their students' learning behaviour.

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