



Lesson plan archiviati: metadata and Web 2.0 applications

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Abstract

In the present article we illustrate the choices taken by the Italian EPICT Secretariat (European Pedagogical ICT License) in order to archive and share the lessons plans developed by EPICT participants during the EPICT Courses. In particular, we present: 1) a set of metadata able to describe the learning resource lessons plan 2) and the advantages in using Web 2.0 features in order to develop a lesson plan repository.

What we want to underline in the present article are two aspects of the development of a resources repository process: the assignation of descriptors and the repository dynamicity. When an author inserts a resource he is doing what we propose to define as a "primary metadatation". From the repository user's point of view, we consider a repository more useful if it is able to "grow" in accordance with the user's needs and orientations. We can obtain this kind of dynamicity if the users themselves, after consulting a particular resource, are capable of adding new descriptions to the metadata and of leaving comments regarding the resources consulted. We propose to define the contribution given by repository users as "secondary metadatation".

1 Introduction

One of the main issues in the present knowledge representation and knowledge management literature scenario, is the definition of metadata sets able to describe as well as possible an electronic resource. In literature we find a variety of metadata sets in order to describe an electronic learning resource; what we propose in this paper is a set of metadata to describe a particular kind of learning resource, the lesson plan.

2 Lesson Plans and EPICT Italy: a repository for teachers' professional growth.

What is a lesson plan? A lesson plan is a document in which a learning scenario is described. A lesson plan contains guide lines for teachers in their role of instructional designers. Van Es e Koper (Van Es e Koper, 2005) refer to the lesson plan as a detailed description of the activities planned for a lesson. Van Es e Koper claim that every lesson plan has to contain an introduction, an explanation of teachers' roles and duties, an explanation of students' roles, the pedagogical goals, the list of necessary resources in order to realize the singular activities, evaluation and assessment guide lines.

In Instructional Design literature (Reigeluth, 1999) we can find the characteristics a lesson plan has to present in order to be reusable and simply applicable in different learning scenarios, making possible the personalization process (Adorni *et al.*, 2008): a lesson plan has not to present strict structural constraints, the activities have to be explained in natural language, the activities have not to be planned for a specific context.

The EPICT repository is formed by the lessons plans teachers who participated to the University Master Course "EPICT – European Pedagogical ICT Licence", developed. The University Master Course "EPICT – European Pedagogical ICT Licence" is deployed as an e-learning programme by the University of Genoa. During the course, participants develop a number of lessons plans each focused on a particular ICT technology.

The first criterion in order to classify the lessons plans inside the repository, has been the kind of technologies used in the learning scenario and the school level target of the scenario designed. The repository is inside the e-learning portal used to deploy the EPICT Courses and it is open to all the teachers who have ended the EPICT programme.

The goal of the repository is double: on one hand, the goal is to share the "pedagogical capital" developed by participants during the course and to try and avoid losing it (as very often happens!); on the other hand, the repository can be the space where users can share not only resources, but also thoughts

and experiences, and where they have the opportunity to find new ideas in order to make the instructional design activity less time consuming.

In this perspective, the EPICT community – formed by all the teachers who took the certification – has become a community of practice (Wenger, 1998). At the moment the testing of the repository (aimed to verify if really the repository may support the community of practice) is running.

In order to realize a “social” repository and make the consultation more flexible, we chose an instrument able to guarantee these expectations. We chose LearnWeb (Mazzetti *et al.*, 2008), a web 2.0 instrument for the storing of web resources, developed within the Ten Competencies¹ project and at present still under validation.

LearnWeb offers the possibility to perform the data-entry by using a lesson plan author (and we call this process “primary metadatation”) and the possibility to add tags and comments by the repository use (and we call this process “secodnary metadatation”). The data entry process is supported by the Dublin Core metadata set.

The activity carried out with the development of the EPICT Italia lesson plans repository, is part of the validation process of the LearnWeb instrument.

3 Metadata for the Primary metadatation process.

Every resource inside a database has to be described by means of a not ambiguous formalism (the metadata), common and accepted by the community of users; we propose to define the process acted by the author when he/she enters his/her resources in the repository, as a “primary metadatation process”.

The choice of a particular set of metadata, corresponds to the choice aimed to privilege some kind of characteristics and properties; the metadata to classify and describe the resource “lesson plan” have to report, besides the essential references, the information useful to understand the educational and pedagogical “potential reuse” of those resources. The main classification metadata standards for learning resources are the Dublin Core and the LOM standards.

In order to address these two goals, we chose – as Merlot² repository did - to use the Dublin Core standard with the integration of a subset of the LOM metadata (Educational category). Finally, we decided to integrate with some other metadata specifically addressed to describe the particular resource “lesson plan”, the metadata set obtained by the sum of the Dublin Core and the subset of the LOM Educational set. These last metadata have been defined taking into account what the sectoral literature proposes about the categorization of

¹ <http://www.tencompetence.org/node/91>

² Merlot, uses a subset of Dublin Core and LOM metadata, and use some features for the social dynamicity of the repository

pedagogical resources (GEM³, EdNA⁴ e POEM (Alvino *et al*, 2008)).

The Educational LOM metadata chosen are: the context of application (Context), the age of the students to whom the lesson plan is addressed (Typical Age Range), the resource complexity (Difficulty) which we think to describe with the elements contained in the UNESCO ICT Competency Standards for Teachers⁵, the time of implementation of the learning scenario described in the lesson plan (Typical Learning Time). We add, in order to refine the metadata set specifically for the lesson plans, the following metadata: Prerequisites, pedagogical objectives, Didactic Strategies, Didactic Techniques, Disability, Accessibility, Kind of deployment (the use of technologies in in presence settings, or in e-learning settings).

Figure 1 describes the process we follow in order to define the set of descriptors (metadata) chosen by the design staff of the EPICT repository.

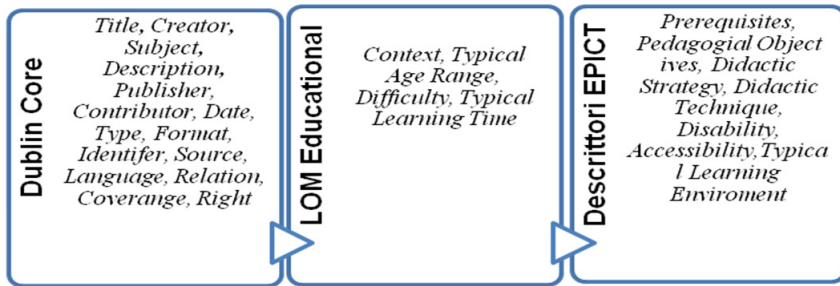


Fig. 1 – The descriptors for the metadatation of the lesson plan in the EPICT repository

The following 25 parameters are the ones developed in order to describe the lesson plans and archive them in the EPICT repository. (Table 1).

TABLE 1
LESSON PLAN METADATA

ID	Category	Description	Descriptors
1.	Title	Name given to the lesson plan	Free text

³ <http://thegateway.org>

⁴ <http://www.edna.edu.au>

⁵ <http://www.unesco.org/en/competency-standards-teachers>

ID	Category	Description	Descriptors
2.	Creator	An entity primarily responsible for making the lesson plan	Free text
3.	Subject	Topic of the lesson plan	Free text (expressed as keywords)
4.	Description	A textual description of the content of the lesson plan	Free text
5.	Publisher	Editor of the lesson plan	Free text
6.	Contributor	An entity responsible for making contributions to the lesson plan	Free text
7.	Date	Date of publication of lesson plan	As defined in ISO 860190 (YYYY-MM-DD)
8.	Type	Nature or genre of the lesson plan	Free text (expressed as keywords)
9.	Format	File format of the lesson plan	. txt: text files . doc, docx: Microsoft Word . htm, html, shtml, shtm, stm: web pages . asp, aspx, php or dwt: dynamic web pages or scripts . mp3, ogg or. WAV: sound tracks . pdf for PDF . png, bmp, gif, jpg, jpeg, or. psd,: image files . xls: Microsoft Excel . zip or. rar compressed files . exe, com, bat and. Cmd . dwg, DXF CAD drawing programs . avi, mpeg, wmv, mp4, 3 gp video files
10.	Identifier	An unambiguous reference to the lesson plan	URL of lesson plan
11.	Source	Features of the lesson plan in relationship to other resources	URL of the resource reference
12.	Relation	Resources in support of the lesson plan	URL Resource Kit
13.	Language	Language of the content of the lesson plan	As defined in ISO 639
14.	Coverage	Spatial or temporal characteristics of the intellectual content of the lesson plan	Free text

ID	Category	Description	Descriptors
15.	Right	Information about rights held in and over the lesson plan	Copyright Copyleft
16.	Context	Typical kind of learners	Kindergarten Primary school Secondary school Higher Education University
17.	Typical Age Range	Age of typical users	From 3 to 5 years From 6 to 8 years From 9 to 11 years From 12 to 14 years From 15 to 17 years From 18 to 20 years After 21 years
18.	Difficulty	Information about the complexity of use the lesson plan by the teacher	Standard UNESCO ICT Competency Standards for Teachers
19.	Typical learning time	Useful time to make the project described in the lesson plan	10 hours of lessons (or less) 11 to 20 hours of lessons 21 to 30 hours of lessons Over 31 hours of lessons
20.	Prerequisites	Prerequisites for using the lesson plan: disciplinary and technological	Free text
21.	Learning Objectives	Description of the general objectives: knowledge, skills and abilities. Shows what the student will know/ be able to do after the training program.	Knowledge Skills Abilities
22.	Didactic Strategy	Teaching strategy	Behaviorism Cognitivism Constructivism
23.	Didactic Tecnique	Teaching methods	Lesson Tutorial Modeling Case Studies Problem based learning, Project Learning based Role Playing Jigsaw Other
24.	Disability	If the lesson plan has been projected also for disabilities students	Motor disability Cognitive disability Sensory Disability

ID	Category	Description	Descriptors
25.	Typical Learning Environment	Description of typical learning environment	In presence A distance Blended

4 The secondary metadatation process

The primary metadatation process requires the application of precise rules able to transform the natural language in a controlled language. The risk of such a process is its potential rigidity. Even if a community of experts has chosen the metadata used to archive a lesson plan, a new individual may have a new perspective on the resources not expressed by the metadata descriptions.

The formal description may be incremented by information that the users of the repository may add after the consultation of the resource.

A repository built with Web 2.0 features, offer to users the possibility to add tags; this process is the one we refer to as “secondary metadatation process”. The adjective “secondary” has not a negative valence, and is not used to diminish the relevance of this moment by comparison with the primary metadatation process. The ordinal connotation refers only to time criteria, because it is performed after the first kind of metadatation.

Precious is the secondary metadatation process added value: it consists in the fact that users may add a description to a lesson plan on the basis of their tested or perceived usefulness.

Inside LearnWeb (figure 2), the secondary metadatation process takes place with three modalities:

- With the possibility of attribution of “stars” to a resource. It is a sort of evaluation metadatation with which the user may express his/her personal liking of that resource. It’s a 5 point evaluating scale, that considers also the medium point (3): enough.
- With the possibility of adding new tags. This is the so called social bookmarking adopted by a number of web 2.0 environments. Its function is to allow the user to express a personal thought and alternative descriptions to an already classified resource;
- With the possibility to insert comments from the users of the resources. The natural language of the comment supplies precious information to whom in the future will consult the same resource.

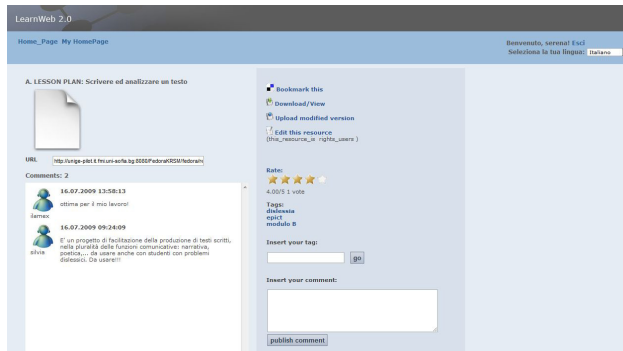


Fig. 2: The LearnWeb environment

Conclusions and 3.0 perspectives

The present contribution wants to propose a solution to the problems related to the management of the electronic resource metadatation process. In particular we focus on a specific kind of resources, i. e. the lesson plans. We identified two steps of this process, the primary metadatation, and the secondary metadatation. The first refers to the activity done by who inserts a lesson plan in a repository; the second refers to the activity a user may perform after he/she has consulted the resources.

For the primary metadatation we proposed an application profile tailored for the lesson plan resource; for the secondary metadatation we identified some instruments able to collect the users' feedback. The second moment aims to make the repository a useful instrument where users may find resources archived not only by a strict categorization, but also by means of professional keywords, goodness evaluation, or free comments. In order to test and evaluate the opportunities and constraints of the presented approach, an experimentation is being carried out with the participants of the EPICT Italian Courses of the academic year 2008/2009.

The next frontier is to build an ontology identifying the relations among the different descriptors. This way it will be possible to create instances capable of making the repository a semantic instrument. We are planning to build the lesson plan ontology and to use the instruments of the semantic web, with the aim of understanding and testing how these new instruments may support the work of teachers and instructional designers nowadays: Will the semantic web be richer or more confused than the syntactic one?

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