Preparing Teachers to the use of LOs: an analysis of conceptions

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Abstract

Promoting the sharing and reuse of school resources is a complex issue which entails preparing teachers to adopt new ways of working. Due to the lack of a tradition in this sense, it is not easy to figure out what kind of teacher training can really prove successful to this end. This work describes an experience we carried out in a teacher training course on basic ICT, where we are trying to set up meaningful activities on the preparation and use of educational Learning Objects. In this paper we focus on a study devoted to explore the conceptions of trainee teachers as concerns the preparation and re-use of educational modules, which allowed us to spot points that require special attention and should be explicitly addressed in teacher training programs. We also outline some activities that we consider suitable to address the needs emerged from the mentioned study.

1. Introduction

Learning Objects (LOs) have been receiving increasing attention in education in the past several years, and much effort has been devoted to define a standard for constructing, organizing and cataloguing them [9]. Repositories of LOs are considered possible valid tools to exploit the potentials of Internet for education and training, since they allow teachers to share materials and experiences on a wide basis, and also support autonomous learners by offering them a choice of self-consistent, inter-related and organized educational modules [1].

Sharing didactical materials, however, is no straightforward task for teachers, but requires of them a good amount of labor both to integrate in their own lessons other people’s productions and to prepare new contributions in a form that can be easily re-used and adapted by their colleagues. Unfortunately, little attention is usually paid to explicitly prepare teachers to become good users and producers of LOs [4]. It is not surprising, hence, that teachers still appreciate in limited measure the re-use, in their work, of such technological artifacts which have so far been used more in enterprise training than in school teaching.

A greater awareness of these problems forms the basis of some studies aiming to increase and improve teacher’s involvement, by helping them to connect the technological and the educational aspects. Among the features which have been object of study, we recall, for example: the need to describe resources in a way ‘understandable’ to educationalists [11]; the influence of the users’ attitude on the approach to the choice of metadata [8, 10]; the usability of metadata schemes [7]; quality issues [5]; teacher preparation tasks [6].

What kind of teacher training could prove successful in promoting a culture of sharing and re-using of educational resources is not obvious, since there is not yet a tradition in this field, or at least a good number of varied experiences to be used as examples.

These considerations are the starting point of our work. In order to help make a step ahead in training teachers to profitably work with LOs, we added a module on this topic in a teacher training course on ICT introduction, in which we guide the trainee teachers to analyse, from the point of view of re-use, a set of educational modules prepared by a different group of trainees. In order to improve the effectiveness of this activity over the years, we started at the same time a study of the conceptions that trainee teachers have on the issue of re-using educational material produced by some colleagues. Such approach was suggested by the fact that studying the conceptions of teachers and students is considered important in many fields (see e.g. [12] as concerns mathematics education) as a prerequisite for effective education and training. We decided, hence,
to check if we could obtain from it useful suggestions also for the considered topic. The results of our study have been encouraging, in that they helped us to spot a number of points on which it appears necessary to focus more precisely our intervention.

In this paper we briefly present the content and structure of this investigation, and what insights and suggestions we obtained from it.

2. Exploring the conceptions on LOs of trainee teachers

2.1. Experimental setting

The course “Multimedia in Education”, in which we carried out our study, belongs to the Teacher Training School (SSIS; http://www.ssis.unige.it) of the University of Genoa (Italy). It is a 3-credit course, for prospective teachers of secondary school in all disciplines. Around 100-130 students take part in it every year, subdivided into six disciplinary areas (humanities, foreign languages, scientific disciplines, art and drawing, philosophy, support to problem students). It concerns basic introduction to ICT and aims to prepare trainees: 1) to consciously use multimedia and web tools in their school practice; 2) to be operatively aware of ICT evolution and impact on society, in particular on the school world. The course is subdivided into modules on different topics, each of which includes both a theoretical and a practical part. At the end of the course, the trainees are requested to work out an educational module on a topic of their choice, by applying the technological tools learned during the course, and to describe in a document all aspects relevant to support its use, such as pedagogical approach, expected audience, etc.

We recently decided to include in the course an introduction and some practical work on LOs, since our studies in this field [2, 3] and our experience in education led us to think that the best way to promote a natural, thoughtful and fruitful use of LOs would be to make trainees become familiar with them among the basic ICT tools.

Around 100 trainees took part in this experiment.

2.2. Introducing LOs in teacher training

Our module on LOs was planned so as to make trainees aware of the problems that can be faced in the re-use of material, and hence prepare them to pay attention to key elements, both when selecting among their colleagues’ materials and when preparing some didactical module to be possibly easily re-used in different contexts, by themselves or by other teachers.

Moreover, we aimed to guide our trainees to learn to make meaningful summaries of educational modules, including all elements which are relevant for easy re-use, yet without becoming cumbersome or redundant. We think that it is very important that teachers acquire good summarizing abilities in order to effectively become able to contribute to the construction of LOs repositories.

As practical work on this topic, we asked our trainees to analyse some didactical modules that we selected among those prepared (as end-of-course project) by the previous year’s class. We performed this selection so as to include in it materials with different content knowledge, different pedagogical and technological approaches, and appropriate for different school level. As concerns the pedagogical approach, our choice included:

- tutorials organized in purely sequential way;
- hypertextual tutorials;
- guided visits to some topic, with thought-stimulating questions, (e.g., critical analysis of some paintings);
- tutorials followed by exercises of various kinds: closed-answer tests, gap-filling, open answer questions, links to some software allowing one to carry out construction exercises.

Our choice was limited to these kinds since these were the only available in the educational material we had at disposal. Though it would be obviously interesting to analyze also the reaction to more constructive materials, we think that its exclusion did not decrease the validity of our study, since the considered types are those that our teachers use more often in their work. Trainees were requested to freely choose one module among the proposed ones, trying to figure out a concrete reuse of it in their work. We did not give the trainees the descriptions originally associated to the selected modules, in order not to influence their analysis with observations reported by the authors of the materials but not spontaneously risen during the material’s examination. The guidelines given for the analysis of the didactical modules are reported in Fig.1.

2.3. Spotting conceptions

Our aim was to obtain information on the conceptions of young teachers on several points:

- What aspects are considered important in a didactical module? What aspects are overlooked, which are in fact important for
resource sharing, and should therefore be considered?

- Are trainee teachers able to see a role for a given module in their own teaching?
- From what point of view do teachers consider re-usable material? Do they try to enrich their professional activity by learning from other’s experiences, or are they just looking for concrete suggestions that could help decrease their workload?
- What relation do teachers see among the selected material and the final users?
- What information do teachers consider it important to transfer to their colleagues in view of re-use?
- What kind of pedagogical information do they consider it important to transfer together with a didactical material?
- How do teachers adapt their way to structure their own lessons when they are going to use somebody else’s material?

We wanted, moreover, obtain information on how teachers view technology-based didactical materials, in relation with traditional ones, such as:

- Do teachers look at technological materials in the same way they would look at a textbook?
- How is the importance that they attribute to the aspects of traditional materials adapted to technological ones?
- Do they consider the technological choices made in implementing the material as influencing its effectiveness?

3. Conceptions emerged

A first interesting point, which clearly emerged from the modules’ summaries prepared by our trainee teachers, is that content knowledge is the main (and sometimes only) aspect of the didactical material on which they focus. Neither the pedagogical approach nor the technological choices seem to be considered as being strictly part of the module’s overall content and in condition to influence the usability and effectiveness of the analysed material. They mostly appear focused on judging the re-usability of the material only from the point of view of the content validity, that is, correctness, completeness and consistence. They mostly appear to consider the re-use of the didactical modules only within a traditional teaching context, even when the characteristics of the analysed material would support its use within a more active work.

They mainly (90%) assume to re-use from the given materials the content knowledge (which includes texts, pictures and exercises), adding on their own both the pedagogical approach and the delivery mode. For this reason, they often disregard any mistake or poor choice on the technological level (81%). Analogously, they often forget to take into consideration any technical problem entailed by the re-use, such as the fact that some material may include a video and hence require the availability of some software tool for visualization or some particular plug-in for its full use (85%).

Didactical modules, moreover, are considered to be necessarily complete objects, rather than parts of a didactical itinerary. Materials are often being criticized for being incomplete with respect to a global approach to some field (69%), and suggestions are given for completing them by adding more material (46%), rather than by associating them with hypothetical modules on other topics within the same field (10%).

Comparing the reports produced in this experimentation with the descriptions produced for the same materials by their authors, it emerges that prospective re-users often (40%) do not foresee the range of application possibilities that were prospected by the module’s producers. This, in our opinion, depends in equal measure on excess of optimism of the authors and on lack of attention of the re-users.

As concerns devising possible educational scenarios for re-use (such as topic, school type and students’ age), our trainee teachers showed some lack of fantasy, probably dependent mostly on the limitation of their professional experience. This is emphasized, in particular, by their choice of keywords, which appear mostly aiming to frame the module’s content within their own specialization (78%) rather than within a general school context, and hence not suitable to identify the module inside a prospective repository accessed by teachers of any discipline.

Some trainees, finally, view the didactical modules as chunks of knowledge based on which teachers can work out something useful for their students. Only a few of them express a wish to know the guiding ideas underlying the design of the modules and their previous applications, in order to be better in condition to plan for their re-use.

4. Suggestions for teacher preparation

The above observations show that much work needs to be done as concerns preparing teachers to an
effective use and production of LOs, and helped us spot points that require special attention and should be explicitly addressed in training programs.

Knowledge is not the only aspect of didactical materials that can be recycled. Re-using a LO should not be simply a shortcut to speed up the selection of content knowledge and exercises, but also an opportunity of professional improvement, by getting ideas on teaching methodologies and presentation ways, since these components are always inevitably present in any module. Trainee teachers should be guided, by means of meaningful comparisons, to pay attention to such components and to their impact on taching and learning, so that disregarding any part (material or conceptual) of a given material be a conscious decision, not due to lack of attention or inexperience.

Didactical modules do not need to be exhaustive; teachers should learn to shape their own itineraries by combining several LOs, from different sources, with parts of their own. A useful exercise in this direction is the design of consistent and articulated activities based on the use of LOs from different origins retrieved from a repository constructed ad hoc by the trainers.

A same didactical module may be fruitfully used with different pedagogical aims. This is a point where our trainees showed to be bound to a rather traditional view of teaching. A useful activity in this respect consists in proposing them two or more different activity outlines, asking them to re-use a same LO in different ways. This activity help also develop an attitude oriented to interdisciplinary work, which is something currently recommended by many school programs, but to which teachers are scarcely prepared and inclined, at least in our school system.

Also the abilities of producing materials in correct and easily re-usable ways need to be developed. To this aim, two types of activities appear to be useful. The first one consists in assigning a topic to a group of trainees, asking each of them to prepare a didactical module on one part of it, working individually and following a set of guidelines provided; this will be followed by group work aiming to put all pieces together in a coherent framework. This joint activity aims to make the trainees remark how difficult it is to put together pieces of work that were not developed with this aim, and to point out the need to follow some common “standard” (e.g., concerning the use of symbols and notation) and to build one’s modules so that they can be easily broken into pieces to allow assembling with external material; this implies, e.g., avoiding links with a complex structure within a module.

The second kind of activity consists in letting trainees work in pairs, each preparing a module and revising each other’s production. This activity helps teachers to increase their awareness of possible re-uses in different contexts, and to look at their own productions from the point of view of re-users.

5. Conclusions

We are planning to improve the module on LOs of our course by following the lines described in the section above. We think it is important that such activity include both a theoretical introduction and an operational part, in turn articulated into re-use and production of LOs. We consider necessary for the teachers to explicitly address, and put in relation with each other, both re-use and production of modules, in that these activities entail different kinds of abilities and awareness, as we noticed by observing our trainees at work.

We wish to point out, however, that the work to be done is certainly too big to be completed within one course, especially in a course, like ours, not exclusively focused on LOs. The wide range of aspects to be addressed suggests that teacher preparation to the use of LOs should take place in different moments of the training curriculum, and be organized so as to increase trainees’ interest in creating communities of teachers willing to share and re-use didactical materials [3].

Our work is focused on the pre-service preparation of teachers, both as concerns the study of conceptions and the outline of formative activities to carry out. We expect the situation to be slightly different as concerns in-service teachers, since these can count on their professional experience but also need to overcome years of individual teaching habits. In order to be extended to in-service teachers, our work should, hence, be adapted by means of a correspondent study of conceptions, and completed with the outline of possibly different ad hoc activities.

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6. References


Description of the didactical module

- It should be formulated so make a prospective user understand the main features of the module and the actual possibilities of reuse this learning object outside the educational context where it was created.
- It should be formulated taking into account that talking to another a colleague of yours who wishes to receive from you clear, fast, exhaustive and easy-to-read information.

Your description should contain:

- your identification; title of the module examined;
- a short summary highlighting the main aspects of the modules, so to help the users to decide if this product can be of their interest or if they should look for something else; 4 to 6 keywords;
- what information you can deduce on the creation context;
- possible sources of re-use difficulties, possible errors;
- suggestions to improve it;
- your opinion concerning possible educational re-use, possible contexts of re-use (grade and topic), kind of didactical action, objectives, so as to answer to questions like the following ones:
  - What is the expected audience, the didactical objectives and the contexts of use?
  - What kind of educational material is it (tutorial, reasoned guide, drill-and-practice, etc.)?
  - Does this module follow a precise educational approach?
  - What use can you figure out for it? What are the strong and weak points in relation to such use?
  - Are any prerequisites required? Which ones?
  - Do you think it could be useful for your teaching?
  - What information on this module would you like to have to make your plan of using it? How much do you think you should modify it?
  - Does this module require teacher’s mediation, or can it be used autonomously by the students?
  - How difficult does it appear with respect to what you identified as its context of use?

Argue your choice of re-using or not this module or an improved version of it in your own teaching, and explain for what kind of activity.

Fig.1. Guidelines given to our trainees for the analysis of didactical modules