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How Teacher Educators Seek, Create and Share Information in the Digital Age

An empirical study of OER's repository

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Abstract— This contribution presents the results of research conducted as part of a European project, Share.TEC, which was dedicated to the development of a repository of Open Education Resources (OER) and commercial educational materials intended for teacher educators. This research involved inquiring into the pedagogical requirements of teacher educators for information and digital materials in order to understand their present comportment, habits and needs, as perceived through two indicators – information literacy and user created content (UCC). By means of a combination of research methods dedicated to the observation of practice and the collection of user data, the investigation explored models of consumption, perception and needs regarding information for teacher educators with reference to Open Education Resources.

Teacher Educators; Open Educational Resources; User Created Content; Information Literacy.

I. INTRODUCTION

Share.TEC is an online OER repository dedicated to teacher educators (TE) [1]. It was developed under the aegis of a project of the same name which had as its objective the development of a system to foster access, retrieval and sharing of pedagogical material for Europe. This system is based on an aggregation of federated and extendible Open Education Resources (OER) and commercial repositories. It provides a gateway for a critical mass of digital contents and is expressly designed the use of teachers educators.

This article presents the results of research undertaken in order to understand the pedagogical needs of teacher educators, in respect of material available from digital sources, through the collection of

data on their behaviour, habits and attitudes, filtered through indicators of their information literacy. The research objective was to individuate the modalities used to facilitate and sustain the commitment of teacher educators regarding new forms of digital material such as OER. By means of the combination of focus groups and questionnaires created for observing and collecting data on the practices of the subjects, the research explored the uses, perceptions and pedagogical requirements of teacher educators in relation to digital resources.

The study revealed that many teacher educators use digital materials to develop new ideas for instruction and retraining, but the greater part of these do not know of the existence of the OER platform; instead, they utilise generic research instruments (such as Google). Furthermore, the great majority of teacher educators publish very little: they do not share digital contents beyond their institutions e-learning platforms, and so fail to participate in the interactive philosophy typical of web 2.0. The study identified the need to assist teacher educators who have not had the knowledge or support to create digital contents and share them with other teacher educators. In addition, the results of this study underscored how the understanding of the social and professional context of teacher educators in their use of OER can be useful in the design of an OER repository system able to support the aims of its intended users.

II. BACKGROUND TO THE STUDY

One of the central requirements of the Share.TEC project was to understand how to satisfy the actual needs of final users of the system. From a technical point of view, this question was dealt with through the

development of a model and a system of validation, field testing, analysis of feedback and fine-tuning with end-users, throughout the project [2]. This work was undertaken to define the requirements of the system through understanding the diverse activities that the end-users might attempt to carry out when using the Share.TEC platform, and to provide them with a simple, familiar and friendly interface.

The technical part of the project was completed thanks to an inquiry carried out by the University Ca' Foscari of Venezia (CIRDFVA) directed towards comprehending the pedagogical question of what are the needs and the requirements of teacher educators in a context in which the exchange of information has been profoundly changed by the development of web 2.0-type possibilities, and the panorama they face grows ever-more complex compared to what it was when they were taught how to practice their profession. In addressing the needs of the teacher educator, two aspects were taken into consideration: one technical and practical; the other prospective [3]. The technical/practical aspect pertained to the collection of information to determine what functionality would be most useful, interesting or suitable – not only to allow the immediate and intuitively simple answering of a simple query (and other functions) – but also to incentivise the sharing of resources in restricted and less-restricted groups, including those open to all.

The other aspect that was dealt with in this inquiry looked into the actual pedagogical needs of the end users for digital information and other materials. This question is complex because there have been profound changes in recent years in teacher education, in both the educative and technological sectors – and these have not always been correlated. Teacher educators have many needs that are not satisfied by the available systems; they require new systems that could offer more functionality to meet their requirements. Share.TEC was a prototype of an innovative system that would meet not only the “technical” needs of its users but would also be more responsive to the actual requirements of its users, both from the pedagogical point of view and from that of their professional practice.

In addition to this complexity, the contributors to the project had to keep in mind that the OER systems are relatively new environments still partially unknown in the daily, practical world of teacher education. Therefore the consortium had to confront the problem of the motivation of teachers and their educators to engage with a system that was not yet familiar to many of them. For this reason, before presenting the system to teacher educators (through a series of workshops, as

provided for in the original design of the project), it was considered important to ascertain the competence of teacher educators in regard to information literacy and to the evolution of the web 2.0 environment, in such a way as to permit the understanding of how much the Share.TEC system was more responsive to their needs and expectations, compared to other systems that they were already utilizing.

III. RESEARCH VARIABLES

In order to identify the profile of the actual user of Share.TEC, as opposed to the ideal one, it was decided to inquire into the habits and the practices of teacher educators both as consumers and as producer of information and of digital resources (web 2.0). The analysis of this profile yielded the material necessary to compile a questionnaire. In order to obtain a more complete picture of the profile of a typical teacher educator, it was considered important to divide the study into two parts. One was directed at exploring if and how teacher educators utilised web 2.0 resources in their free time; the other to investigate in detail their habitual professional practices regarding the use, the creation and the sharing of information and resources in the web 2.0 environment. These two aspects were considered complementary for understanding the present teacher educator profile. In fact, the idea of also inquiring into how teacher educators use the web 2.0 environment outside of their professional practice should furnish more detailed information on the potentiality of teacher educators to be users of Share.TEC. After all, before a practice is incorporated into ones professional ambit, there is always a learning period in which learners experiment on their own account in order to familiarise themselves with the new environment and its dynamics. Meanwhile, those who have already consolidated these practices into their professional ambit are potential users, open to learning about and eventually utilising an OER repository. In fact, user created content (UCC) – and open education resources are a good example – are usually products created by users outside of their normal practice and professional routines [4].

Consequently, it was decided to inquire into the following variables in order to determine what use, outside of the professional practice of teacher educators, was being made of them in web 2.0: 1) Publication requirements. Verify whether teacher educators are using the web 2.0 environment outside of their professional practice, as in social networks, and if they are actively participating in communities in which they share their products (excluding from the inquiry email, chat, and similar activities). 2) Creative effort.

Verify if teacher educators have constructed original products, engaging in a creative effort, or if they have adapted something pre-existent to create something new. This creativity signifies that the users must have added their own value to the work. The creative effort required by user-created content often has a collaborative element, as in the case of web sites which can be modified collaboratively by their users [4].

For aspects more typically linked to the professional practice in which teacher educators resolve their needs for information and the use of digital material, it was decided to single out the skills defined by Information Literacy, which was developed in the field of higher education, promulgated by Unesco [5], since it is closely related to the use of a repository such as Share.TEC. Information Literacy is considered a fundamental area of competence in the development of the knowledge society. In this regard, teacher educators play a strategic role in the transmission of new information processes to new generations of teachers. To determine the information needs of teacher educators, the following research variables were investigated: 3) How teacher educators locate and evaluate the quality of information sources; 4) how teacher educators store and retrieve information; 5) how teacher educators apply information to create and communicate knowledge; 6) finally, what teacher educators know about the ethical use of information (for example, Creative Commons Licences).

It should be noted that it was not the objective of the study to inquire into the entirety of information literacy, but only into those abilities considered relevant to the retrieval of Open Education Resources by teacher educators.

IV. MEANS AND METHODOLOGY

This study utilised a combination of qualitative and quantitative methods in order to identify the principal dimensions required for construing a profile of teacher educators and their information needs in relation to web 2.0.

To determine which dimensions to investigate, the team from the University Ca' Foscari di Venezia, CIRDFFA (Interuniversity Centre for Education Research and Advance Training) selected focus groups as the principal means for the collection of data. This technique is particularly useful as it allows the perceptions and attitudes of participants to emerge and assists the researcher in intuiting what might be important to analyse in the development of successive questionnaires. The informal setting of the focus group encouraged the participants to express their individual opinions. This method also allowed the exploration of a

wide range of comments, as most of the questions had been formulated as open-ended in order to permit those taking part to express themselves with a degree of freedom.

The analysis of the discussions (which had been recorded with the consent of the participants and transcribed) began with the sorting of the data into categories through the grouping of responses. The categories obtained were then sequentially refined, summarised and compared with characteristics revealed by other studies undertaken within the ambit of user created content and information literacy [4, 5]. The preliminary analysis of material obtained from the focus group permitted the identification of those items in the questionnaire (which consisted of a combination of yes or no questions, multiple choices and open-ended questions) that best allowed the collection of data on the users' experience. Following this, the questionnaire was tested to see if was capable of returning significant results. CIRDFFA sent out an email to a hundred teacher educators inviting them to fill-in an anonymous questionnaire. Forty-four out of the hundred that had been contacted returned completed questionnaires. The protocol for the inquiry was developed by the team from CIRDFFA and then shared with the Share.TEC partners, who were asked to provide feedback which could lead to modifications. In the event, the questionnaire was approved in its entirety.

It is important to note that this inquiry did not attempt to furnish a global valuation of the experience and perceptions of the potential users of Share.TEC. It proposed, rather, to explore some of the attitudes and practices of a particular group of teacher educators in their use of open education resources. The results outlined below present what was discovered through the structured analysis of some of the data furnished by the questionnaire. Through the interpretation of these results, it is possible to obtain a cross-section of the practices of some teacher educators.

V. RESULTS

The study was conducted on a sample of 44 Italian teacher educators (22 male and 22 female) who had taught both new and experienced teachers. The average age of the sample was 54.7 years, with a standard deviation of 8 points. The sample comprised an average experience of 8.7 years for the female and 6.9 years for the male teachers, with 7.8 years as the total average.

There was a slight predominance of university professors at 52.27% (23) over high school teachers at 47.73% (21). Teacher educators for the humanities

were 43.18% (19) female, and 34.09% (15) male; for the sciences, 9.09% (4) female, and 13.64% (6) male. In the total sample, there is a clear majority from the humanities, 77.27% (34) compared to those from the sciences, 22.73% (10).

A. Do teacher educators use the web 2.0 environment?

The inquiry was focused on the use made of the web 2.0 environment by teacher educators in their spare time. This was determined by whether participants in the survey were registered in one or more social networks (blogs, Wiki, Delicious, Facebook, Youtube, etc). The results demonstrated that 59.09% (26) of the total followed a social network (31.82% women and 27.27% men), but only 40.91% (18) of the sample participated actively through, above all, posting text messages, as opposed to employing other formats such as images, video and audio.

B. Do teacher educators create or adapt user created resources in the web 2.0 environment?

In answer to the question as to whether teacher educators produce or creatively adapt material in order to contribute to a social network, the percentage descends to 15.91% (7). These 15.91% principally produce texts, but not images, video or audio.

C. How do teacher educators locate educational materials and what kinds do they search for?

This section asked what are the research tools that are used routinely by teacher educators to locate educational materials, whether for their basic teaching or for professional updating. The section allowed for more than one answer. The results showed that 77.27% (34) utilized generic research engines such as Google (females 40.91% and males 36.36%), together with other resources such as scientific journals (40.91%, that is 18 teacher educators, of whom 18.18% were female and 22.73% male) and libraries (25%, that is 11 teacher educators, or whom 15.91% were male and 9.09% female). Other international information services seemed to have been less frequently utilised: Google Books (29.55%, that is 13 teacher educators, of whom 13.64% were female and 15.91% male) or Google Scholar (13.64%, that is six teacher educators, of whom 4.55% were female and 9.09% male). Social networks (such as Facebook, Delicious, blogs, Wiki etc) seem to have been little used to search for information, on average about 6,82% (3), despite there being many projects for teacher educators in the fields of education and pedagogy (see Fig. 1).

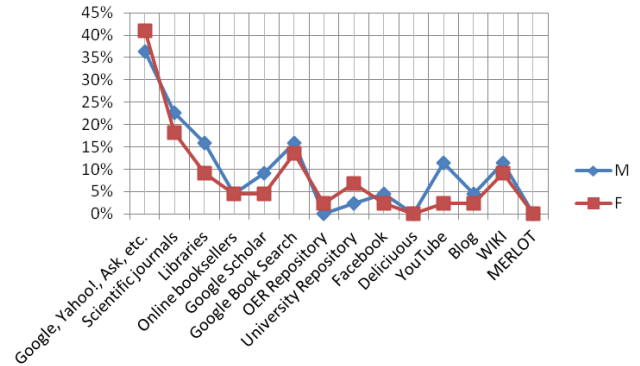


Figure 1. The graphic shows the tools used by teacher educator to search resources online.

Generally, teacher educators search for material in their own languages, 59.09% (26) of the sample, while 40.01% (18) searched in another language (English, French and Spanish).

The question regarding the types of educational resources most searched for by teacher educators allowed for multiple answers. The section allowed for more than one answer. The survey revealed that teacher educators search mostly for lessons (95.45%, 42), then syllabuses (63.64%, 28), study programmes (54.55%, 24), teaching methods (52.27%, 23) and teaching activities (52.18%, 19). There was less interest directed towards texts for exams (9%, 4).

Preferences for the formats preferred by teacher trainers was also investigated. The section allowed for more than one answer. The results showed that the most requested format (84.09%, 37) is the written word (MS Word and Adobe PDF), while images and web pages assume, respectively, an importance of 29.55% (13) and 43.18% (19). Other types such as slides, video and educational software have lesser importance, respectively, 29.55% (13), 25% (11) and 18.18% (8). The files least requested are audio (mp3, podcasts, etc) which are searched for by only 6.82% (3) of the sample.

D. How do teacher educators store and retrieve information?

The great majority of teacher educators (93.18%, 41) download materials to their own computers. Cloud computing, or the use of on-line storage space, is utilized by just 4.55% (2) of which 2.27% (1) use Google Docs to save materials in text format to share with their own students.

E. How do teacher educators utilize information to create and communicate knowledge?

This objective of this section was to discover whether teacher educators produced teaching materials

in digital formats for their courses, not only for their students but also to share with other teacher educators. In this regard, participants were asked if they had experience of online courses (blended or e-learning), as these activities require the production and sharing of digital materials (lessons, syllabuses, teaching activities etc.). The data revealed that 81.82% (36) had experience of blended or e-learning online courses in which they provided materials on institutional e-learning platforms, although only 18.18% (8) had delivered courses in classroom. There were differences in the manner in which digital resources were made available: 61.36% (27) made their materials accessible by passwords only, 20.45% (9) allowed open access to their materials, and 18.18% (8) did not allow any access to their own materials.

When the participants were asked explicitly if they would be willing to publish their private educational resources in an open online repository for teacher educators, their responses reflected the practices revealed in the previous questions: 18.18% (8) would make their materials available without restrictions; 52.27% (23) would make their materials available but with entry restrictions and registration; and 29.55% (13) would refuse to make their own resources available to others.

The questionnaire also inquired into whether the teacher educators participated in practice or learning communities.

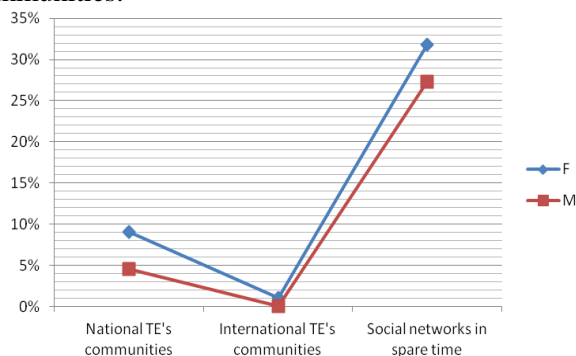


Figure 2. The graphic shows the comparison between teacher educator participation in national/international communities and in social networks in their spare time.

As noted in the introduction to this paper, the existence of communities for the development and sharing of open education resources encourages the dissemination and use of digital materials, which is essential to the success of a system such as Share.TEC. The resulting percentages were not encouraging: 9.09% (4), female; 4.55% (2), male. As regards participation at the international level, the percentages were yet lower: 2.27% (1) female (see Fig. 2).

F. How can this type of information be employed ethically? (Creative Commons Licences - CCL)

One of the principal characteristics of open education resources is the possibility of the reuse of digital materials. This highlights the important role played by Creative Commons Licences in the ethical use of information. Of the 44 participants in the study, 81.82% (36) declared their knowledge of the existence of CCL, although they had never used them; 6.5% (3) did not know what they were; and the rest (5) did not respond to the question. When asked if they had ever utilised any of the several types of CCL, 98% declared that they never done so, unless a university or publisher had protected their material.

VI. DISCUSSION AND CONCLUSIONS

Teacher educators maintain that both their instruction and their own learning must be creative if it is to succeed in stimulating new young teachers and those already in service. More than ever, the production of educational resources has assumed a strategic role in professional practice. From the inquiry undertaken by Share.TEC, it emerges that teacher educators find comparing experience with others in the same profession a source of inspiration, creativity and new knowledge; and that with respect to the past, the retrieval and reuse of digital resources is of considerable importance in their professional practice.

It also emerges that the participation in their free time of teacher educators in the web 2.0 environment arouses their curiosity and interest. But they are not yet true producers of user created content, as defined by the OECD [5], and the analysis of their professional practices shows how timidly they approach utilising the potential of web 2.0.

Despite the lack of knowledge in this sample of the existence of open education resources, the participants seem to be potentially interested in these types of systems. Above all, the profile of teacher educators is still weak in certain information literacy skills that are important for the development of informal learning in the ambit of Lifelong Learning, of which open education resources are representative. It would seem that for teacher educators, in this particular sample, searching for information is a mechanical process in which they limit themselves to a small set of sources, alongside the use of generic research engines such as Google. The storage and retrieval of information is not achieved through web 2.0 systems, but by means of traditional methods. The sharing and communication of digital materials is still confined within institutional e-learning platforms. Also the choice of text for the production of education materials remains prevalent, at

the expense of multimedia resources (audio, video, still images) which are rarely searched for.

Other weakness which emerge from this research include a lack of knowledge about the ethics of making information available through Creative Commons Licenses, which by restricting the publication and sharing of materials could increase resistance to the use of open education resources. In addition, a substantial number of teacher educators are blocked by the language barrier from contacting colleagues in other countries and using their digital materials. Nonetheless, the questionnaire reveals the strong desire of teacher educators to share their educational problems with others in their community, even if there are few opportunities for doing this at present. And a change in attitude toward informal learning might be detected in the much higher participation of teacher educators in social networks in their spare time than their participation in national teacher education communities.

It is very likely that these obstacles could be overcome through the adoption of a policy by higher education institutions to support the dissemination of open educational resources, combined with the development of informal teacher educator communities. Rather than confine the materials produced by teacher educators to institutional e-learning platforms, a plan should be actuated which

would stimulate teacher educators and researchers to develop and share open education resources.

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