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Defining the design parameters of a teacher training course on the incorporation of ICT into teaching practices

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Abstract

Bearing in mind the widespread use of multimedia resources in education, mainly due to the wide range of possibilities available on the Internet, teacher training must propel quality use of technology and foster updated knowledge and skills related to the Web 2.0, video production and publication, blog construction, wiki-based collaboration, selection of multimedia resources and many others. In order to contribute towards the debate on initial and continuous teacher training in the use of Information and Communication Technologies (ICT) in the classroom, this paper discusses how the use of videos in teaching practices can contribute to improve learning. After presenting an experience dealing with a real training course for teachers, the text will define the design parameters of this kind of courses aimed at incorporating ICT into the teaching practices, with a special focus on the creation and use of audiovisual resources. The authors present a method in an attempt to categorise the abilities and resources provided by media and the way in which they convey information. They also include some conclusions dealing with the implementation of these resources in today's education systems.

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1. Introduction

In order to make change in education efficient while causing minimal dysfunctional behaviour, poor habits that hinder the process should be reviewed and modified. Learners and teachers should not only be provided with updated and innovative means and devices, they should also be taught how to use and implement them and how to take full advantage of these resources. Training is thus one of the main steps to be taken. The literature on the subject (BATES, 1999) advocates that staff development should be embedded in a broad range of strategies related to the context of workers.

Continuous training is a mandatory aspect when dealing with ways and methods devoted to equipping educators with aptitudes and skills required to teach. Bearing in mind the widespread use of multimedia in education, mainly

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due to the wide range of resources available on the Internet, teacher training courses must propel quality use of technology and foster updated knowledge and skills related to the Web 2.0, video production and publication, blog construction, wiki-based collaboration, selection of multimedia resources and many others. In order to contribute towards the debate on initial and continuous teacher training on the use of Information and Communication Technologies (ICT) in the classroom, this paper discusses how the use of videos as a part of the teaching practice can contribute to improve learning. After presenting an experience dealing with a real training course for teachers, the authors will define the design parameters of the course aimed at incorporating ICT into the teaching process, with a special focus on the creation and use of audiovisual resources.

The authors present a method in an attempt to categorise and classify the profits of digital resources and their role as efficient and effective channels of information. They also take into consideration ways that would help organise these resources in order to take full advantage of them and improve the whole process. The method proposes different levels of abstraction for students to learn successfully: from the least abstract one (doing) to the most abstract one (symbolizing). In other words, teachers may start with direct purposeful experiences (doing), then they would start watching video files, looking at images and listening to audio files (observing) in order to finally improve their abstraction skills (symbolizing).

Previous research on Computer Assisted Language Learning (CALL) has already proved that the use of sophisticated resources, such as video files, has very positive effects on the teaching and learning process. However, many institutions willing to implement them would not be able to do so because of their high price. Moreover, less expensive resources such as texts and hypertexts may be more appropriate and effective when teaching some specific contents than others which are considered to be more sophisticated. This fact proves that different kinds of resources should be used when transmitting knowledge concerning a particular subject. It is fundamental thus to use methodologies that would make the selection of multimedia resources for instructional design easier. This could contribute to maximise the benefits without exceeding budgets set beforehand.

2. The training course

Almeida (2002) pointed out that the incorporation of technology into the learning and teaching practice is a challenge in education, highlighting that the teacher training and the access to equipment are not enough. It would be necessary to go beyond education centres and spread training and technological skills across them in order to reach broader familiar and work contexts. This fact would contribute to bring about an important shift in culture. Moreover, this author observed that it is necessary to assist the educator while carrying out his/her daily tasks in an attempt to favour, in parallel, critical and reflective activities linked to transforming, progressive and motivating practice. Some of the factors that must be taken into account when implementing innovative programmes combined with technology are: hardware and software, continuous investment, political and pedagogical support, and continuous teachers' training, trying to show the potentials and limitations of integrating technology into practice. In this section, a discussion related to a training course focused on video production will be briefly presented. The training process took place at a private college in Campinas city, Brazil, and was totally free for teachers who work at this institution and who were interested in the use and creation of video and other multimedia files (figure 1).

The design models of the instructional systems comprise instructors, learners, materials and the technological devices. During the training phase, there were two instructors in charge of planning and conducting the tasks: an expert on radio and television and an expert on multimedia and e-learning. Concerning learners, the college teachers attended both theoretical and practical classes on how to use multimedia resources in education, with an emphasis on videos. The materials used for training were designed, created and provided by the instructors. These learning materials comprised a booklet to be printed and a set of hypertext pages which included audios, videos, images, and resources for additional reading. Other required materials were cameras and computers and specific software devoted to editing video and audio files. Learners were provided with a web-based distance education environment through a Web portal including useful links and instructions. As for additional personnel, there were cameramen who filmed teachers while doing the practical exercises in the recording studios at the Campinas College. Moreover,

there were experts who edited the resulting multimedia files in order to generate short video lessons which lasted 10 minutes each.

The evaluation and validation of the training course were carried out through both questionnaires and informal interviews while students were also invited to perform tasks such as simple video editing by using open source software. The results indicated that it was necessary to review several features concerning instruction. These results have been taken into serious consideration and have allowed authors to design and define new parameters for future teacher training in ICT.

The importance of teacher training cannot be underestimated and the costs of multimedia production must be always taken into account during decision making. Therefore, one of the main conclusions was the fact that the high costs of producing and editing video files could hinder its massive use in the context of the aforementioned institution. Due to this restriction, additional planning led to the development of a strategy to produce multimedia files in an attempt to maximise the benefits of using as many kinds of media as possible, from audio and video to software and text, and from image and animation to simulations and hypertext. This approach helped authors propose a broader comprehensive set of topics aimed at improving the design of a new teacher training course on ICT, as will be shown in the next section.



Figure 1. The training course

3. Design parameters for teacher training in ICT

This section is aimed at defining the main design parameters of a teacher training course devoted to incorporating ICT into teaching practices, with a special focus on the creation and use of audiovisual learning materials. The training course described in the previous section provided a perspective on how to train teachers in topics such as video production and usage. This study led to the definition of the design parameters of this new teacher training course.

The training course would be addressed to educators and would be focused on videos. In order to consider appropriately both the production and use of videos, other topics of interest must be taken into consideration. Therefore, the training phase would consist of 100 hours divided into 10 parts of equal duration: 6 hours devoted to

distance learning and 4 hours to face-to-face (FTF) practice. Part 1 would emphasise basic knowledge in computers, especially hardware, while part 2 would complement this review with software related themes. Part 3 would emphasise production and storage of information while part 4 would emphasise communication. Part 5 would be devoted to accessibility and digital inclusion, part 6 would emphasise markup languages such as Hyper Text Markup Language (HTML), Extensible Markup Language (XML) and Mathematical Markup Language (MathML). Part 7 would emphasise models and standards for learning objects in order to consider the specificities of educational content development. Part 8, on the other hand, would emphasise the edition of different media such as images and videos, topics of importance when the use and production of multimedia resources is of interest. Videos and other media may incorporate sound, therefore part 9 would emphasise the many possibilities involved in audio production, edition and use, from podcasts to mobile devices. Finally, part 10 would emphasise all technical and artistically relevant aspects involved in educational video production, from cameras to studio lighting and from scripting to video capture. A detailed description of aims and contents included within these 10 parts may be found on De Siqueira et al. (2010).

4. Organising media used in education systems

While media refers to any kind of data including audio, text, hypertext, graphics, images and video, the term multimedia suggests a collection of different types of media or the ability to handle those collections. In this way, multimedia may be seen as the combined use of several media, such as sound and full-motion video in computer applications. Educators working at schools and universities with broadband Internet connections may now download and upload multimedia easily, a context in which the Web largely replaced CDs as the means of delivery.

Repositories for free access to multimedia are being developed through public policies in different countries in parallel to initiatives such as the “One Laptop per Child” (http://www.nied.unicamp.br/novidades/novidade_completa.php?id=37), which intend to bring computers to the classroom. In Brazil, some examples include the following: “Portal do Professor” (<http://portaldoprofessor.mec.gov.br/index.html>), “Banco Internacional de Objetos Educacionais” (<http://objetoseducacionais2.mec.gov.br/>) and “Portal Domínio Público” (<http://www.dominiopublico.gov.br/>). This scenario brings about a new challenge: how to select the media that could be used to teach. In this section, a method to categorise the options provided by media to convey information is presented as a way to debate how to organise the resources used in education systems, from traditional face-to-face (FTF) teaching combined with multimedia to innovative distance education based on multimedia and hypertext.

The method aimed at categorising media and their availability to convey information was originally developed by Dale (1946) and has been recently reviewed by Simonson et al. (2008) in the perspective of distance teaching and learning. This method may be of importance to educators since the selection of materials to teach is increasingly complex due to the availability on the Web of repositories with large sets of texts, hypertexts, videos, animations, interactive software, simulations, games, images, photos, audios, etc. The instructional design must be as efficient as possible and must not be too realistic, as the least abstract options may be too costly to produce or too difficult to use. Furthermore, they could even include too much irrelevant information. On the other hand, the most abstract options may be inexpensive, but may be difficult to understand or incomplete in terms of information. As a consequence, an educator must balance the amount of videos, images, texts, etc. in an attempt to use different media in an effective way.

This method classifies the experience into three main categories, from the least abstract one to the most abstract one: doing, observing and symbolising. In the first category, doing, the educational experience involves: (I) direct purposeful experiences, being multisensory and highly qualitative; (II) contrived experiences, including a representation of reality; and (III) dramatised experience, being involving and qualitative. As for the second category, observing, the educational experience involves: (IV) demonstrations, when the learner becomes a spectator; (V) study trips as a way to have a view of real conditions; (VI) exhibitions, through edited reality; (VII) educational television, mediated reality; (VIII) motion picture, with edited mediated reality; (IX) still pictures; and

(X) radio and recordings. In the third category, symbolising, the educational experience involves: (XI) visual symbols; and (XII) verbal symbols.

When using the method an educator may classify the different media available to teach a particular topic and then balance the learning experiences of his or her students. This approach tends to avoid the common misunderstanding the fact that it is necessarily better to be more realistic. In terms of use of resources, it tends to be more appropriate to use multimedia products already available on the Internet and minimise the need to produce new products, in special the ones resulting in higher costs, like videos and software. In this way, educators may have high quality educational experiences designed for his or her students in a cost effective way.

5. Conclusion and future work

The value and significance of teacher training has long been recognised. Ongoing training of educators can be a vital tool to ensure the success of educational processes, benefiting both teachers and students. In this way, once equipped with the necessary skills, educators may turn to be more proficient in their role as teachers. After considering a practical experience involving teacher training in video production and use, this paper presented a course proposal divided into 10 complimentary parts and discussed the need to better balance media selection and appropriate methodologies. In this way, educators may have the opportunity not only to incorporate new technologies into their teaching practice but will be also better trained in how to select the media they are going to use in a cost effective way. Future work will consider the development of a step-by-step procedure for multimedia selection based on its requirements before the production phase.

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