CHAPTER 6

TECHNOLOGIES MAY HELP THINKING...

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Introduction

The objective of teachers' personal and professional development is an excellent reason to reflect upon the innovation issues in education and a rare opportunity to implement the use of portfolios in the teaching practices.

The most recent developments of digital technologies allow experiencing new organisational and knowledge building that

state the diversity and multiplicity of purposes, both alone and as a group.

From the reflection on these two aspects comes up the present proposal for the analysis and evaluation of the technologies which may easily be accessed by the educational community and may be used in the process of electronic portfolios building.

In what teachers are concerned the use of portfolios can become a powerful means helping the change of the educational practices (Cardoso, Peixoto, Serrano and Moreira, 1996) if it is adopted as a metacognitive and reflexive strategy about teaching about them (Galvão, 2005).

However there is a lack of information about what portfolios are, which technologies can be used, how they are prepared and how to take advantage of them. All these questions point out to the need of a specific training in this field.

Accordingly, this chapter especially aims at helping teachers in that process, providing an analysis and evaluation technologies grid based on their pedagogical potentialities for the building of digital portfolios.

It is organised in three points related to the phases of the mentioned grid building process.

The first one – *"Starting point and work objectives"* – deals with the initial questions and with the objectives of the work that has been carried out.

In the "Development strategy" a special attention is given to the most significant moments of the process, i.e., the identification of the portfolios objectives (2.1) as well as the identification of the possible analysis categories (2.2).

In the last part – *"Analysis Grid"*–, the concrete proposal we came up to is presented, resulting from the reflection made during the previous stages.

1. Starting point and work objectives

There are several proposals for the characterization and classification of ICT; however, most of them are not directly based upon pedagogical features, that is on what one can do and what can be done in educational contexts. As it is referred by Laurillard (1993), it is a rather difficult task especially if we consider that this classification may be of any help for the teacher and based upon pedagogical and didactic aspects, providing real and detailed information about the possibilities of an educational use, on what conditions, etc.

Bearing in mind the previous mentioned difficulty we chose to suggest a grid for the analysis and evaluation of today's available technologies which would have in consideration the

substantial objectives usually related to the portfolios use and that might contribute for the identification of their educational potentialities.

On the other side it was our intention that this analysis and evaluation grid might be autonomously used by teachers willing to adopt those tools or needing any specific help in this area.

2. Development strategy

The first step taken was researching the existent bibliography and raising up some systematized questions which, in spite of being related, would result in four different phases or moments: i) portfolios objectives identification; ii) possible analysis categories; iii) analysis grid organisation; and iv) demonstration and application to concrete examples.

2.1. Portfolios Objectives

To collect data that might put in evidence the set of objectives usually associated to the use of portfolios in educational context we have selected and analysed some texts that have been used as a reference to the research that has been made on this subject.

From the essential features of the portfolios definition used by several researchers [Almeida (2003); Balan & Jelin (1980 *cit. In* Sá-Chaves, 1997); Bernardes and Miranda (2003); Coelho (2000 *cit. In* Bernardes & Miranda, 2003); Paulson and Meyer (1991 *cit. In* Serafim, 2000); Sá-Chaves (2000); and Nunes (2000)], we arrived to the conclusion that, in spite of the different conceptions, objectives and lay-outs, in general portfolios follow the same building process, stating in an implicit and/or explicit way several dimensions and different focus. We enhance those in Table 1.

In a very simplified way we present the objectives which are inherent to the building of portfolios and result from the essential features of the definitions taken as reference.

Table 1

Objectives related to the building of portfolios and their focus

Educational Portfolios Objectives	Dimension / Focus
To promote the reflexive thinking *To evidence the self-reflection process*	Reflection
To structure the procedures of teaching and learning *To collect information in a structured and personalised way*	Structure
To stimulate communication among al the intervenient in the educational process *To develop interactive and collaborative processes*	Communication
To promote student's autonomy in the learning management *To commit students in the learning process*	Motivatio

	n
To facilitate the student's participation in the contents selection and in the evaluation criteria *To negotiate the choice of the content to be included according to the established criteria between teacher and student*	D e c i s i o n
To register the procedures and document the learning process *To exhibit the works that can evidence the acquisitions*	V i s u a l i s a t i o n
To involve actively all the participants in the learning process and in their evaluation *To provide new teaching ways and participated and productive learning environments*	P a r t i c i p a t i o n
To show evidence of the effort and progress in the knowledge and competences acquisition process *To enhance the process of personal integration of knowledge the acquired during the theoretical and practical training.*	E v o l u t i o n

2.2. Analysis Categories

In the attempt of helping to identify the best technologies that may respond to the learning objectives associated to the building of electronic portfolios, we have started from the systemisation proposed by Laurillard (1993) in which the teaching/learning process comes up as the result of the interaction between teacher and student, as indicated in Diagram. 1. It is a referential that puts ahead the reflexive practice of student and teacher within a dynamic continuous interaction process in which the teacher has the role of coordinator, mediator and learning facilitator.

To perform this role the teacher needs to reflect together with

his students, to show them the new paths, means and procedures required to the acquisition of new knowledge.

According to these assumptions Diana Laurillard (1993) argues that ICT can play a fundamental role in the process and she distinguishes several pedagogical strategies (discursive strategy, adaptive strategy, interactive strategy and reflexive strategy) according to the main function in the learning and teaching process.

Diagram 1
Learning and teaching strategies
(Model adapted from Laurillard, 1993)

Those are, in fact the strategies we took as reference to analyse and evaluate technologies. An evaluation based upon the learning and teaching strategies used to achieve the required objectives for the portfolios building and which may be explained in a more detailed way:

Discursive strategy: It allows keeping a communication relationship among the several actors.
Discursive strategy: It allows a communication relationship among several actors. It is a strategy in which a systemic research attitude can be found from the teachers and students and that can be helpful in understanding the teaching and learning process, by identifying its cognitive, affective and action dimensions.
Adaptive strategy: it allows the design of learning activities based upon the conceptions of the different participants, combining evolution and adjusting to each concrete situation. The teacher tries to understand in order to act, adapting the activities to the specific needs of each student or group of students in a certain moment.
Interactive strategy: it specially allows the representation and the exchanging of ideas and contents using several ways of expression (text, pictures, sound, video...). It is a strategy in which a mutual attitude of listening and a permanent dialogue between teacher and student prevails.

Reflexive strategy: it specially allows the reflection and knowledge deepening based upon the record of different ways of structure and thinking organisation. Analysis and critical thinking are dominant and student is supposed to reflect not only on what he is learning but also on his own role in the process of learning and teaching.

2. Analysis Grid

According with the initial purpose the present Analysis Grid arises as the result of the combination of the above mentioned strategies with the necessary objectives to the building of portfolios. As we can see on table 2, it is an analysis guide structured around four considered axes (strategies), the intended reflection on each of them (objectives) and the possibilities of the piece of the analysed technology.

Table 2

Analysis and evaluation proposal of ICT educational and pedagogical potentialities related to the type of strategies and specific objectives of portfolios building

Pedagogical Potentialities	
DISCURSE STRATEGY (Communication, Participation)	– *To keep a continuous communication relationship among several intervenient;* – *To negotiate contents and objectives (teacher and students);* – *To express ideas related to the negotiated objectives;* – *To participate actively in the knowledge building process.*
Adaptative STRATEGY (Evolution, Selection)	– *To build learning activities fitting the conceptions of the different intervenient;* – *To adapt the learning objectives to the students' interest and bearing in mind the*

	interactions (dialogue); *– To recognise the advantages and difficulties in the portfolios building process;* *– To allow a personal and social commitment in the teaching and learning process.*
INTERACTIVE STRATEGY (Motivation, Visualisation)	*– To give student feedback, helping him to achieve the learning objectives;* *– To recognise the meaning of the teacher's feedback in a way that he can gather the content which fit best his profile;* *– To add other information aiming at complementing a given content/topic;* *– To represent ideas/contents using different ways of expression (text, images, sound, video…).*
REFLEXIVE STRATEGY (Reflection, Structure)	*– To reflect upon and write about the teaching and learning process;* *– To structure and record students' ideas, perceptions and convictions;* *– To reflect on the student's descriptions;* *– To give different ways of knowledge organisation*

	allowing the knowledge deepening.

4. Final considerations

Though we are still in an initial development phase of portfolio implementation in educational contexts, we believe that they can become an interesting strategy which promotes reflection on the teachers' practices and has great potentialities in respect to the curricular innovation.

Portfolios allow the development of more participated learning environments as well as they favour the awareness of each student on what he is learning and how he is learning. The teacher performs a role of vital importance in the management of the process and in the effective support to the individual learning.

Though they can be effectively built with traditional means, the possibility of using digital means, namely the most recent such as "weblogs", "wikis" and other "social software" available and free in the net, brings up an enormous potential if conveniently integrated and used in educational context. However, this implies the mastering of these tools, specifically in what concerns their choice and adequacy to very specific objectives as in the case of electronic portfolios.

This subject gave origin to research work that is being developed within the frame of the current Project. We expect it may contribute to a deeper knowledge on how "Technologies may help thinking".

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