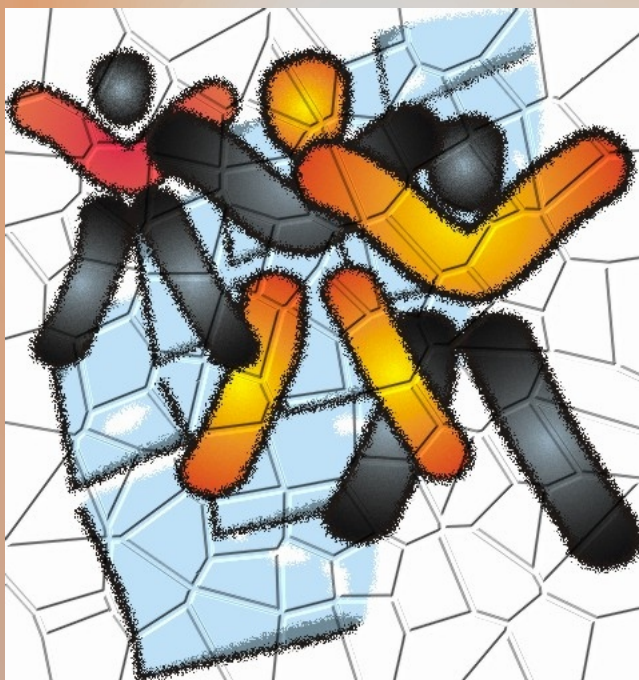


Digital Portfolio as a strategy for teachers' professional development



Associação de Professores de Sintra (ed.)

DIGITAL PORTFOLIO
AS A STRATEGY FOR TEACHERS'
PROFESSIONAL DEVELOPMENT

This publication has been carried out with the support of the European Commission in the framework of the Socrates Programme. It reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

Edition: Associação de Professores de Sintra

ISBN: 989-20-0382-9

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©Cover by Jorge Oliveira

Print: Grafoeste, Artes Gráficas, Lda
Printed in Portugal in 2006

This publication can be ordered from Associação de Professores de Sintra, Praceta Francisco Ramos Costa, 13 C, Tapada das Mercês
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Preface

This publication is one of the outcomes of the first year of the Project Comenius 2.1 DigiFOLIO, *Digital Portfolio as a Strategy for Teachers' Professional Development* reference number 226464-CP-12005-1-PT-COMENIUS-C2-1 within the framework of the European Union SOCRATES Programme.

This Project includes eight partner institutions from five European countries – Belgium, Czech Republic, Finland, The Netherlands and Portugal.

The publication results from the first year research work undertaken by all the partners with the main objective of establishing a common theoretical framework regarding the role of digital portfolios in the educational system of the above mentioned countries.

In order to document the current situation and the role played by the Digital Portfolios in each partner's country, the national teams started by producing a National Report where some of the essential questions were responded allowing the following work phase of building up a comparative synthesis of all the reports. This comparative synthesis is included in this publication.

As Coordinator of the Project I would like to thank all the partners who have contributed for this publication devoting much of their time and effort to the quality of the present work.

I also thank deeply the partners who helped to organise the Project meetings which came out to be meaningful moments of debate, reflection and sharing of knowledge.

To Magnus Person, the Project Consultant, I also thank for all the support and advice throughout the first year of the Project.

Finally, on behalf of the project partnership, I would like to thank the European Commission for the opportunity given to put in practice the original idea firstly stated in the project proposal.

Maria Adelina da C. Laranjeiro
Project Coordinator

Introduction

This publication results from the research work undertaken by the partner institutions involved in the Comenius 2.1 *Project Digital Portfolio as a Strategy for Teachers' Professional Development* with the main purpose of enhancing the educational possibilities of portfolios supported by ICT in teachers' professional development.

From the conception phase of the project it was very clear for all the participants that the use of digital portfolios would be an added value to education, since this resource could mean a contribution for the professional growth of teachers by giving them the know how to use new educational resources, approaches and strategies.

In this perspective, it was agreed that this publication, one of the outcomes of the project, would state the conceptual framework resulting from the common understanding and the identification of vital issues and key aspects summed up by all the partners in their national reports. These documents were produced in order to present the current theories and identify the legal framework and the current practice in each partner's country.

This publication reflects the different stages of the use of electronic portfolios in education in the five European countries involved in the project (Belgium, Czech Republic, Finland, The Netherlands and Portugal) as well as the national legal framework that supports teachers' professional development and the current use of information technologies in education.

Bearing in mind that teaching is a complex task which demands time to test new ideas, evaluate their effects, adjust strategies and approaches, and that it requires a permanent effort to reach all students and make learning meaningful, the use of new tools, resources and approaches can definitely contribute to the new vision of professional development that is being called in favour to support teachers' efforts and to adjust their teaching to the actual learning needs of their students.

Digital portfolios can serve these purposes, allowing and contributing for the reflection on the teachers' goals, assessing their practice strengths and areas which need improvement documenting at the same time their professional growth thus generating ideas for future teaching development.

In the participant countries there are different experiences regarding the use of educational portfolios. We would say that schools in Portugal and in Czech Republic hardly use these resources neither for instruction nor assessment on a regular basis. Differently Finland, The Netherlands and Belgium have a considerable experience in the use of portfolios as a learning/teaching and assessment tool. However, the digital portfolio in Europe is a recent acquisition for educational purposes.

To demonstrate the current situation in the five concerned countries there are examples of recent and current good practice on teacher education curriculum, namely in identifying the educators' required competencies to work and function over time in a changing society that demands a lifelong learning process.

On the other hand through the use of portfolios teachers and students can develop a shared understanding of what constitutes quality work and acquire a common language for evaluating students' accomplishments. The process of developing digital portfolios can foster and document evidence of competencies and guide long-term professional development and are recognized as a reflexive and proactive means to achieve a global vision of one's learning path with the advantage of increasing students' skills and competences in the use of ICT. In fact, digital portfolios promote active participation of the learners by helping them to assume a sense of ownership and control and they definitely contribute to improve assessment and motivation as well as enhance learners' involvement in their own learning process.

This educational resource also enables constant processes of feedback and updating and set teacher and student communication on a closer, more flexible and more effective

level. Although the process of creating a digital portfolio may be considered the crucial point, the students' responsibility as to content and form is also at stake, since the public display of their work will inevitably expose them before a wide range of readers/consumers/users.

DIGITAL PORTFOLIOS AND PROFESSIONAL DEVELOPMENT OF TEACHERS

CHAPTER 1

**A COMPARATIVE SYNTHESIS OF
THE NATIONAL REPORTS**

DIGITAL PORTFOLIOS AND PROFESSIONAL DEVELOPMENT OF TEACHERS

A COMPARATIVE SYNTHESIS OF THE NATIONAL REPORTS

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Introduction

This chapter aims to present a comparative synthesis of the national reports about portfolios and electronic portfolios and their articulation with the professional development of teachers in the partners' countries.

Teachers' Professional Development and Portfolios

Nowadays, the demands imposed on the school and its privileged agents, the teachers, are more and more complex. Teachers are given the enormous task of preparing pupils for the society and economy of knowledge, in both of which they will have to be learners throughout their lives.

We know that teacher quality is the variable which, alone, has more effect on the learning experience of pupils, even though it does not, in itself, guarantee the quality of teaching and learning at school (Darling-Hammond, 2000; Darling-Hammond e Snyder, 2000).

There is a consensual acknowledgement regarding the understanding of the key role of the teacher not only as an agent of education, but also as an agent of change and reform within a space where he/she is simultaneously the object and subject of this very change: the understanding of this double role of teachers while agents of change has drawn attention to their professional development and also highlighted the inadequacy of traditional ways of conceiving information. This is particularly evident in the practically exclusive focus on initial training before professional practice.

Investing in and insisting on the quality of teacher training has, thus, become a repeated issue in the literature on this

specialization, particularly the training period which follows the initial training and accompanies the development of the teacher's career.

Research has shown that there is a great lack of support and incentive in teacher development which has to be surpassed. Teacher training has to be viewed within a framework of life-long learning, making it more flexible and capable of responding to new needs, be they those identified by the teachers or others based on the demands of the educational and school systems.

What, however, is understood by the term professional teacher development?

The expression professional teacher development, as is the case with other concepts within the educational field, lacks a consensual meaning and is generally approached from a number of different angles, which demonstrates, to a certain extent, the complexities of the phenomena to which it is applied, while simultaneously displaying the diversity of possible meanings.

In a simplified way, we can use professional teacher development to refer to the evolution of the teacher throughout his/her career. It is the process beginning with the initial training of the teacher right up to his/her leaving point. In other words, it covers the initial training and continues, just like all the other processes experienced in a lifetime which contribute to the enhancement of professional practices and the professionalism of the teaching staff. "Teacher development is the professional growth a teacher achieves as a result of gaining increased experience and examining his or her teaching systematically" (Glathorn, 1995:41).

The concept refers to the process experienced, demanded, sought and led by the teacher, on the level of improving his/her professional development through refresher activities, establishing a critical analysis of his/her practices and becoming aware of the reasons behind his/her professional practices. As Fullan refers (1995) the central nucleus of this process is to learn how to teach and to teach better and better.

It may be distinguished from the activities of continuous training and the simple accumulation of experience because, as Day points out (1998), it covers more than meeting the eventual needs of training in the teacher's specific educational practice. Thus, it accommodates the broadest of needs motivated by the desire for long-term growth and improvement. According to the author, it applies to all learning experiences, both formal and informal, which are used by the teacher and end up being reflected in the improvement of the quality of his/her role. "this is the process by which, whether alone or accompanied by colleagues, teachers review, remove and spread their commitment as the changing agents of the moral proposal to teach and by which they acquire and critically develop the essential knowledge, skills and emotional intelligence for good professional thought, planning and practicing with pupils, young people and colleagues through each stage of their lives as teachers" (Day 1999:4).

Villegas Reimers (2003:13-14) has underlined some of the basic characteristics of this process in his recent review of the literature regarding the professional development of the teacher:

- he looks upon the teachers as learners, which presents a more constructivist and less transmitting perspective of teaching and learning;
- he considers teachers to be lifelong learners, excluding conceptions of professional training restricted to the period before professional activity and suggesting schemes offering systematic support and accompaniment throughout their careers;
- he considers teachers to be learners in context, suggesting that professional training should articulate with work contexts and not be conceived so much as activities performed in a school training context;
- he accentuates the importance of context and on this level shows that it can have diverse and multiple dimensions, according to needs, motivations and local and circumstantial interests;

- he considers it to be a process with a strong connection to the reform of the school. It is more geared towards the construction and evolution of its culture than as a process to simply increase the knowledge and technical skills of the teacher;
- it articulates favourably with the conception of the work of the teacher as a profession and with the model of reflective practice, looking upon the teacher as an agent capable of building, analysing, evaluating and changing his/her practices, as well as re-orienting the founding and underlying values;
- he considers it to be a collaborative process, carried out between different participants in the educational process, whether colleagues, parents, other members of the community or the school management.

Such a complex process invites us to analyse the contents, processes and contexts in which such experiences occur and emerge and manifest aspirations of improvement.

We may wonder about the nature of the teacher's evolution throughout his/her professional life, about the facilitating or inhibiting factors, the policies which promote or restrict it and the aims that govern its promotion or slightest incentive.

Professional development in all the countries involved in the DigiFOLIO project is formally based on an initial training programme of higher education. After the initial training period, the differences between countries are important and much less systematised than in the initial training. On the whole, the participating countries do not seem to have a legal framework regarding theoretical assumptions on professional development, even though innovative practices that seek to stimulate different developmental strategies may be found. Nevertheless, it seems that these innovative practices coexist with more traditional logics in which professional development is almost restricted to the frequency of formal practices of continuous training (in service training). It is in the context of these innovative practices, which are often experimented in very particular contexts, that training, evaluation and development practices with the use of a portfolio fit in.

In accordance with the partial reading of the national reports, we felt it was necessary to make an analysis and a respective comparative synthesis of the different countries involved in the DigiFOLIO project, with particular emphasis on four central aspects:

General Access to ICT, with a view to understanding the extent of computer generalisation in society and the internet access of the population at large.

Political Measures in the Area, from a macro perspective and referring to the more or less favourable “atmosphere” for its use in an educational context.

Use of ICT in Education, with the aim of attaining a global understanding of the penetration level and effective use of computers in schools, with reference, whenever possible, to constant and specific data from the respective national reports.

The use, in particular, of digital portfolios for educational purposes, trying, through the described examples, to briefly summarise the contexts in which there is already experience of usage in the different countries.

Without disregarding the other elements which derive from the rest of the analysed aspects, and which may also contribute to the picture of the global situation in which the DigiFOLIO project will be developed, the main preliminary conclusions on each of the above-mentioned aspects are presented here.

Not only the aspects in which the similarity between the different countries is evident (or implicit) are taken into consideration, but also the particularities and obvious specificities as differentiating elements. The idea is that these specificities may contribute to a more accurate characterisation of the situation, and may also be useful, especially when it comes to designing the training course on digital portfolios, if we wish to attribute a European dimension to it.

A comparative synthesis based on the national reports

1. General access to technology

Even though not all the national reports refer to concrete elements regarding the reality of computer penetration rates in society, the different European statistics allow one to affirm

that access to ICT has increased in recent years and its usage has been generalised more and more for both professional and personal and household purposes¹.

In spite of the fact that some differences are not very significant to the specific aim of elaborating a teacher training course, this also seems to be the case with all the countries involved in the DigiFOLIO project.

It may, therefore, be said that the reduction of costs of computer acquisition and the progressive generalisation of the internet will create increasingly better conditions for its use by the general public, even though some sectors of society may question the advantages of ICT not only in learning terms, but also in terms of social participation and the reinforcement of social cohesion.

This is mentioned in the Belgian report, for instance, where it is acknowledged that "Until now, digital exchanges and participation in Internet forums have not stimulated social participation or reinforced social cohesion.", even though "ICT also offers many perspectives for the participation in a democratic society and the services provision to the citizen by the government.", referring specifically to the introduction of the electronic vote, the increasingly higher use of electronic

¹ It would be interesting to register in the report the most recent data for each country. The data available in several documents, such as the following, could serve as a basis for this to be accomplished:

- Key data on education in Europe 2005 Joint publication Eurydice/Eurostat (July 2005), http://www.eurydice.org/Doc_intermediaires/indicators/en/frameset_key_data.html
- New indicators in education and training Council Conclusions (May 2005), http://europa.eu.int/eur-lex/lex/LexUriServ/site/en/oj/2005/c_141/c_14120050610en00070008.pdf
- Progress towards the Lisbon Objectives in Education and Training - 2005 Report (Annual Report) Commission Staff Working Paper (March 2005), <http://europa.eu.int/comm/education/policies/2010/doc/progressreport05.pdf>

mail, the e-government or electronic public services as forms of social participation.

The report from Finland explicitly presents fairly high figures in different indicators normally used in the characterisation of the countries' levels of "technological development" and the so-called "information society": "In terms of the infrastructure and usage of the Internet, Finland is a well-developed information society." "According to the Finnish Communications Regulatory Authority, half of the Finnish households have an Internet connection. The Advisory Council for Youth Affairs, which is an expert body operating in conjunction with the Ministry of Education, has reported that even 99% of adolescents aged 15 to 24 years old use the Internet.". Moreover, the use of the internet by the younger generations is one of the indicators requiring special attention in the Finnish case since recent studies have shown that "almost 80% of children under ten years of age use the Internet at home and usage often begins before pre-school."

In short, although some substantial differences in the access and use of technologies between the different countries are natural, we can, perhaps, conclude that, just as the Belgian report mentions "the increasing impact of information and communications technology (ICT) fits in with the broader evolution towards a knowledge-based society." On a macro scale, the current situation seems clearly to favour the experimentation and study of the use of digital portfolios in the context of professional development, as is the case of the professional development of teachers.

2. Political measures in the ICT area

According to European directives which have come to objectively promote the implementation of ICT in the most diverse sectors of society, it may be said that from a political perspective the "atmosphere" regarding the use of new technologies and network technologies is a highly favourable one. They are found in all areas of activity ranging from economy to education, health to scientific research, as well as

administration, services and any type of activity in which the use of computers can bring advantages.².

Hence, and since four of the five countries (with the exception of the Czech Republic) have been an integral part of the European Union since the initial implementation of these measures around a decade ago, a propitious “atmosphere” for the use of ICT in an educational context is to be expected in all of them, expressed through specific political measures, regardless of their content and specificities as far as leadership and managing mechanisms are concerned.

This is what was sought in our initial approach to the national reports, with a view to trying to verify the existence of national projects or other political measures which, in an explicit way, contribute to the creation of favourable conditions for the use of digital technologies in schools, namely by teachers and pupils.

We have also tried to briefly sum up these measures, situating them according to initiative types and suggested leadership (bottom-up or top-down) which is, for some, a critical differentiating factor in terms of effectiveness with which the countries achieve effective results in the use of computers for educational purposes (MESO, 1998).

Based on this analysis, we may conclude that, in one way or another all the partnership countries are experiencing national initiatives geared towards encouraging and promoting the generalisation of computer usage in schools. We have not referred specifically to each country’s separate set of measures, since they are mentioned in detail in the respective reports.

The incentives have a diverse range of impacts which go from the acquisition of computers to the spreading of good practices, from awareness raising and teacher training, differing mainly in accordance with the developmental situation of each country and its respective educational system.

² See more recent measures in Multiannual programme (2004 to 2006) for the effective integration of information and communication technologies (ICT) in education and training systems in Europe (eLearning Programme) Decision No 2318/2003/EC of the European Parliament and of the Council (December 2003) http://europa.eu.int/eur-lex/pri/en/oj/dat/2003/l_345/l_34520031231en00090016.pdf

Being a central aspect of these measures in most countries and also directly related to the main point of the DigiFOLIO project (development of a training course) it seems pertinent, at this stage, to highlight teacher training for the pedagogical use of ICT. Indeed, this is a particularly relevant aspect in the Finnish case due to the degree of systematisation and scope it has accomplished (“the use of ICT in education is already one of the priorities in teacher training”) and the model used can function as an example for other European countries.

More specifically, in Finland all teachers are supposed to frequent a specific training programme with three levels: level 1, for the acquisition of basic competences for the use of the main tools; level 2, based on the acquisition of the necessary pedagogical competences for the use of these tools for educational purposes, in the hope that teachers will play an important role not only in monitoring the implications of the use of ICT in learning, but also, on a more global scale, in the development of society, itself; level 3, for the acquisition and development of more advanced competences whether in the use of computers, in the creation of material, in the orientation of other teachers or in the development of collaboration between institutions, etc...

Indeed, the Finnish case is usually given as an example of one of the most developed societies (Castells, 2001, 2002). This is primarily owing to its high level of technological development which cannot underestimate the importance attributed to ICT and the great impact it has on the development of the actual educational system, as is mentioned in the respective national report.

Other specific components may also fit in here such as the increasingly stimulated importance given to pedagogical knowledge resulting from internet learning and teaching (“appropriate use of ICT in learning and teaching is expected to become part of everyday school life by 2007.”), the obligation of educational institutions to promote interaction and virtual learning, and the encouragement of students to acquire basic research information competences so as to benefit from the information society, or the boost to produce specific material and digital content for teaching and learning, to mention just a few.

As far as the origin of the ICT project initiatives are concerned, we feel it is worth pointing out the cases in which references are made to explicit measures encouraging the presentation of individual school projects. Not so much for the results already achieved (not as good as expected, as we will see in the next point) but for what this can mean both in terms of the decentralisation of decision making and, above all, in terms of acknowledging the strategic importance which new technologies can bring to student and learning development.

This is what is happening in the Czech Republic and in Portugal where the creation of regional and national (or even European) projects is fostered, even though central administration continues to assume an important role in terms of process regulation, such as, for example, through the definition of priority topics for each year. This is also the case of Finland in which local authorities and schools are directly stimulated for the development of specific ICT use strategies in school practices, even though this, in effect, as mentioned in the national report, has not yet led to expected results, at least not as far as the involvement of the leading schools is concerned.

These kinds of preliminary conclusions draw our attention to a need to consider a frequently under-estimated aspect. This aspect is discrepancy, and it is often present between the political statements, what is aimed at being accomplished and what, in practice, is actually achieved in the real results ("the North Americans call this very common phenomenon "wishful thinking"³). This is what we will try to understand in the next point.

3. Use of ICT in Education

As it was previously mentioned, the political discourse is mainly favourable. However, the measures that cause it to function and give it form are not always effective nor do they permit the accomplishment of intended results. As far as ICT for educational purposes are concerned, the situation depends on a number of factors. Some are the result of actual national

³ Wishful thinking - belief that wishes correspond with reality: the unrealistic belief that something that is wished for is actually true or will be realized.

realities, whether in terms of economic development or the mobilization of efforts and achievement ability on the part of the educational system in each country, or the privileged innovation diffusion models, or even specific cultural factors which have no significant relevance to this analysis.

In practice, the use of computers for educational purposes will depend, firstly, on investments and available resources. This type of calculation regarding educational systems is normally based on the availability and facility of equipment access which usually results in measures expressed only by quantitative figures. An example of this is the computer-pupil ratio, excluding more detailed qualitative analyses, such as, for example, regarding the type of work effectively developed by teachers and pupils.

The use of computers in school will also significantly depend on how technologies are received by each educational system, what the main objective with its integration in school activities is, what effective role is expected of computers in the preparation of youngsters and how (and when) it is introduced in the respective study plans . Despite the fact that it is not always easy to make an objective characterisation, especially owing to a lack of clearly assumed options on the level of educational policy (macro level), it is interesting to note what can be inferred on this subject through the different national reports.

The use of ICT in Education also depends very directly on the effective (or lack of) preparation of teachers for their insertion in school activities. Hence, the importance we attribute to the consideration of this aspect in particular, with a view to understanding that specific training has been /is provided to teachers to supervise and support the insertion of computers in their teaching practices, from a pedagogical and educational perspective. It is our aim to verify, through the national reports, how this issue is treated and how the different countries view the role of the teacher in the process of innovation and change aimed at the information society.

Let us begin by observing what is mentioned in the reports on the use of ICT, particularly in educational contexts, in order to get a current picture of things, at least from the perspective of our colleagues who wrote them, so as to try to outline the main convergences and possible contrasts.

As far as the existence of resources and access to computers are concerned, we are of the opinion that the situation is quite diverse since, as is widely acknowledged, we are in the presence of countries with different degrees of economic growth, even though a comparison based on the same type of data and sources is not possible.

Access to ICT in Finnish schools is, according to the national report, “of a reasonably high level”, and the level achieved is justified primarily according to the great investments made during the last decade which provided “advanced technical infra-structures, quality network connections and rapid internet connections in most schools”. Indeed, Finland appears to be the country with the highest levels among the group of project partners, also in terms of availability of “technical conditions” which are crucial, despite the fact that we cannot say that good technical conditions alone guarantee higher rates of usage of technologies, as we will have the opportunity to observe later on, precisely in relation to the Finnish case.

As far as Flemish Belgium is concerned, the national report indicates something similar; referring expressly to the fact that policies encouraging computer usage have made it possible for all schools (primary and secondary) to acquire updated resources and it is expected that pupils “must learn as quickly and as efficiently as possible to use a computer”.

In the case of Holland, in spite of a lack of specific figures regarding the use of ICT in schools, the adoption of strategies that already involve the use of the potentialities of technologies as the central element of many educational institutions is mentioned. It is also the case of the Czech Republic where the most significant aspect is the fairly explicit reference to resistance on the part some schools (“Some schools are very active in accepting new ways of education process; many schools still look for their way.”).

Indeed, as far as this matter is concerned, it is important to understand what the main reasons alleged by teachers and schools in each one of these countries are for such resistance. One of the factors that is usually referred to in literature is based on attitude and the fact that many teachers are not yet

convinced of the potential benefits of the use of technologies in learning (Williams et al., 1999).

For the development of the DigiFOLIO project, and because it seems paradigmatic of a contradiction, at least an apparent one, we suggest a more detailed observation of the results of a study recently performed in Finland and mentioned in the respective national report.

Here, it is mentioned that “the low use rate is partially attributed to what the teachers think about the benefits of technologies from an educational perspective”, at least when it comes to understanding why, in spite of having good conditions both in schools and at home (most have a computer at home – 91% - with internet connection - 82%) its use rate in the classroom is far lower than initially expected. Indeed, in spite of the availability of equipment and positive attitudes (attitudes towards ICT are mainly positive in school - 43% -, or neutral - 40%) “ICT are not a tool used in the classroom on a daily basis”. On the other hand, the observed figures exist regardless of the contents taught and, curiously, they diminish as each teaching level is increased (73% of primary teachers (level 1-6) use the computer in the class with pupils at least once a month, 30% in higher primary (7-9) and only 15% in secondary.

The justifications of the Finnish teachers are also curious since they are based on access difficulties, class time-tables and the time needed to work with ICT. The lack of computers in the classrooms is, as well as a lack of flexible technical support, the main argument of teachers (80%).

In other words, what seems to be significant as far as the Finnish teachers are concerned, is the conviction we have been developing that, from a technical perspective, it is not enough to have working conditions alone for teachers to recognise the potential of ICT and to be predisposed to altering their practices by including the computer in their daily teaching routines and proposing significant tasks to their students for learning with technologies available in today’s society.

In relation to the Finnish study, we underline the idea of importance that a clear view of the potentialities of technologies for learning can have and which, many teachers are still lacking, especially as far as the way they can be used in the

specific classroom context is concerned. As mentioned in the report “teachers do not have a clear view of what significant pedagogical practices can be with ICT” and this is what may hinder the aim to generalise ICT in schools which is what, in rhetorical terms, all the countries seem to be striving towards.

As a contribution to the necessary clarification of the potential of technologies for learning, namely those that are found in the transversal competences which, as is already known, are the central issue in European terms, it is particularly interesting to focus on the distinction made, in the Belgian report, between the three different ways of equating the role of ICT in Education: a) to learn about ICT; b) to learn with ICT; and c) to learn from ICT. A distinction proposed by some authors concerned, primarily, with the intrinsic worth of technologies as cognitive tools, in other words, tools to support thinking (Jonassen, 2000b).

We have focused on this proposal of technology classification, organised according to the intended aim of learning with its usage, since it could be particularly useful in the conception of the training course if the relations between the concept of portfolio, which is to be implemented, and the most appropriate concept of technology, for the defined aims of professional teacher development, are established and discussed.

Even though Finland defends that “learning through computers” is a basis for benefiting later on from ICT potentialities in learning terms, there is also a clear idea that the best way of developing basic competences in technologies is by doing so cross-curricular and through integration in the different study areas. Indeed, this corresponds to what has previously been mentioned, and what the European guidelines currently suggest as well as what may be encountered in the document Key competences in the knowledge based society – A framework of eight key competences (Commission, 2004) which is also recommended as a reference in the design of the training course at the core of the DigiFOLIO project.

To conclude this point, a word on teacher training and the role attributed to teachers which, somehow or other is acknowledged in the different reports as having an impact on the success of ICT integration in schools. As the Belgian report

mentions, there is still a long way to go. Even though it is normally expected that teachers "give the right place in their activities", and it is accepted that this can encourage pupil participation in the teaching and learning process, the situation is still a little "forced" owing to a lack of specific preparation on the part of teachers in this field. Teachers who are more often than not overridden by the pupils themselves in the effective use of new technologies, for instance in communication, such as programmes like Messenger or other chat or collaboration programmes used on the internet, could, in fact, take advantage of this very situation in order to learn from their pupils and thus, take a significant step with the contribution of technologies, towards the construction of a new relationship between those who are teaching and those who are learning.

4. Digital Portfolios for educational purposes

Based on our brief analysis of the national reports, we feel that a closer examination of each country's experiences is needed in order to provide an understanding of the extent to which these experiences are, indeed, relevant to the main aims of the DigiFOLIO project.

However, what we have here is a brief insight into the current situation and the contexts in which technologies are used in the elaboration of digital portfolios which may be considered a first step towards the above mentioned closer examination.

Even though portfolios have been used as a learning and evaluation tool since the beginning of the 90's and a change has been noticed, we can conclude, from our analysis of the national reports that the experiences of digital portfolios among this group of countries, are still few and far between.

This is, perhaps, due to the fact that on the one hand it is still a relatively recent concept and, on the other, it is rooted in the actual progress of technology development and generalisation. In other words, it is a work tool that is still fairly unknown.

In Finland, for example, in spite of its use in some schools and the interest shown in its educational use (from the beginning of school up to university), very few study and practical experience results have been registered. This situation does not differ from that of the other countries and the reasons are also the same.

This seems to be exactly the case of the Czech Republic, in whose national report only a greater acceptance of the idea is mentioned, since its accomplishment of all the necessary changes in terms of higher digitalisation levels of society and schools.

The lack of a legal framework for the use of digital portfolios in Education also seems to be another common point despite the fact that in the Portuguese case, recent political measures determine that a digital portfolio should be created by each pupil and carried throughout the pupil's school education.

As mentioned in the Portuguese report, the use of these tools is not always accompanied by specific training from the perspective of its pedagogical use, which may be the cause of some of the resistances mentioned in the Dutch report. The latter states that "the lack of time", the "extra work implied" or the "reasons for not understanding why they should be forced to use them" are some of the arguments put forward by the teachers to avoid their use. The other obstacles mentioned in

this report include the necessary competences needed for ICT, the changes in the infra-structures of the institutions, as well as the fact that technical issues alone may create resistances on the part of teachers and pupils.⁴

Its use in specific situations seems to occur regardless of the teaching level, even though universities and teacher training are referred to mainly in all the reports as being the main contexts and aims of use. A Dutch university actually stresses the fact that it is the first institution to integrate digital portfolios, while other Dutch universities responsible for

⁴ Besides the obstacles, the Dutch report also mentions the advantages of the use of digital portfolios in comparison with the traditional ones, such as paper portfolios. The advantages referred to may, indeed, provide important information for consideration within the project's scope. The following aspects are highlighted: the fact that the use of links between different parts or contents of the portfolio is very easy; more easily accessible compact products can be shown to a wider audience and seen from anywhere in an online version; the fact that pupils enjoy it and can show their digital achievements; that they can have more attractive interfaces and a professional look; they allow concomitantly the development of ICT competences; the technologies used allow the pupils to write in a more compact form, with emphasis on structure.

teacher training hope to achieve that goal “in the next 5 years”. As far as Portugal and Finland are concerned, some examples of its use at university level are also referred to. Finland mentions specifically the project of the University of Jyväskylä which has published its results in a book which, in our opinion, would be well worth examining in greater detail.

In spite of the fact that teacher training is a privileged area for the use and reflection on digital portfolios, this is not always done with the depth one would expect. This can be inferred from a passage from the Finnish report which states that “the core curriculum... contains only a few introductory modules/courses related to educational use of technologies”.

As regards the tools used in the elaboration of digital portfolios, there seem to be two distinct situations which need to be retained; on the one hand, the use of specific solutions, even if they are connected to other applications, as mentioned in the Dutch report; on the other hand, the use of open and free technologies, such as “Weblogs” or productive tools such as the word processor and software presentations like Microsoft PowerPoint, to mention just a few.

Finally, a reference to the fact that some institutions involved in the DigiFOLIO project have already initiated some experiences using this work and evaluation strategy, for

example, in teacher training or with university level students which may serve as a basis for future reflections within the scope of the project.

Synthesis and recommendations

This brief analysis is the result of the comparison of the content of the national reports. The analysis of those reports show that there is a significant set of common points among the five countries, namely as far as the guiding principles regarding teacher training are concerned, giving priority to constructivist approaches based on the development of autonomy processes, both in terms of the development of teacher and student learning processes. This moving from teaching to learning as the focus of professional development implies new ways of acting and reflecting which encounter in the portfolio the ideal strategy to support this reflection, but also for the register of evidences which allow an evaluation of the process and of the product of the accomplished training work. Today the portfolio is included in the education process of all the countries participating in the DigiFOLIO project, even though they have different level of importance and use. The reports also allow us to identify divergences as to the starting point of each country involved in the project especially as far as the use of ICT and digital portfolio in teacher training are concerned.

The analysis on the research and reflections in this field shows that teachers and students as well as higher education institutions and researchers display a favourable political and institutional outlook and great receptivity towards this work strategy. However, there seems to be a consensus regarding difficulties resulting from the lack of autonomy and competence of teachers to use *portfolios*. It should be mentioned that this might be due to a lack of isomorphic training in which the *portfolio* is used as a teacher-training model which they may implement later on. On this level, it is important to stress the importance of the role of the universities which have adopted this methodology and developed research-action studies, which allow the divulgence of the *portfolio* and its appropriation by teachers and profusion in schools.

If the *portfolio* contributes to the training of more reflective and more autonomous professionals with greater critical ability, we cannot forget that its implementation requires curricular

management competences and suitable assessment, as the development of one field facilitates the development of the other.

When we consider the practices of *digital portfolio* use, we find that there are few experiments and if we cross our reflection over to this area, the *portfolio* concept becomes less precise on a discourse level, clouded by the description of the tool used, leading to a confusion of both. In these cases, the *portfolio* is more similar to a collection of works carried out by the student and presented in diskette and/or CD and or/memory stick.

Based on the above-mentioned considerations and particularly the acknowledged potentialities of portfolios, but also bearing in mind the identified implementation difficulties, we are of the belief that it will be useful to pay special attention to some specific aspects at the core of the *DigiFOLIO* project: a) Preparation that will contribute to the clarification of the term and allow an inclusion of the practices of *portfolio* use as personal development and teaching/learning process development strategies; b) Adequate and appropriate preparation of teachers in fields such as “Curricular Development” and, particularly “Assessment”, so that the strategy of *portfolio* use is the result of each teacher’s conscious decision, based on the benefits that may ensue and on a self-assessment of his/her pedagogical conceptions and effective practices. In other words, it should be the result of each teacher’s “teaching model”; c) Preparation with emphasis on awareness of the implications of *portfolio* use as a professional development strategy, namely in terms of attitude changes regarding assessment and also in terms of necessary competences for its implementation for personal/professional purposes; d) Preparation which discusses the new roles of the teacher in a constantly changing society and which, among other aspects, demands a new perspective on what learning is and the mastering of specific management competences of the life-long self-assessment and training processes; e) Preparation which, from an isomorphic stance, is able to trigger off the induction process while faced with a new learning culture in which students are active agents with increasing autonomy in the decision-making of what to learn, how to learn and where to learn; f) Preparation that uses its students and reflective competences on what is being learnt as final references with a

view to student empowerment as a student but especially as a clarified, critical and autonomous citizen.

National reports

Awouters, V., Bongaerts, K., Dens, G., & Servaas, B. (2006). E-portfolios. National Report of Belgium. Brussels, Belgium: Internal Report of Digifolio project.

Costa, F. A., Rodrigues, M. Â., Peralta, M. H., & Raleiras, M. (2006). The use of digital portfolio in Portugal. State of art and recommendations for teacher education. Lisbon, Portugal: Internal Report of Digifolio project.

de Kruif, G., & van den Brink, E. (2006). E-portfolios. National Report of The Netherlands. Hague, Netherlands: Internal Report of Digifolio project.

Fellner, R. (2006). Teachers' professional development, ICT and digital portfolio in education in the Czech Republic. National Report. Prague, Czech Republic: Internal Report of Digifolio project.

Kuittinen, E., Virolainen, H., Tuuliainen, M., & Lehto, S. (2006). E-portfolios. National Report Finland. Helsinki, Finland: Internal Report of Digifolio project.

References

Barrett, H. (2000). *Electronic teaching portfolios: multimedia skills+portfolio development=powerful professional development*. Available online: <http://electronicportfolios.com/portfolios/3107Barrett.pdf> (accessed 5 April 2004).

Castells, M. (2001). *A galáxia internet. Reflexões sobre internet, negócios e sociedade* (portuguese ed.). Lisbon: Fundação Calouste Gulbenkian.

Castells, M. (2002). *A sociedade em rede* (Vários, Portuguese Trans. ed. Vol. I). Lisboa: Fundação Calouste Gulbenkian.

Comission, E. (2004). *Key competences in the knowledge based society – a framework of eight key competences*.

- Darling-Hammond, L. & Snyder, J. (2000) Authentic assessment of teaching in context, *Teaching and Teacher Education*, 16 (2), 523-545.
- Darling-Hammond, L. (2000). *Studies of Excellence in Teacher Education*. New York: AACTE
- Darling-Hammond, L. (2000). Teacher Quality and Student Achievement: A Review of State Policy Evidence. *Education Policy Archives*, 8 (1)
- Darling-Hammond, L. and Sykes, G. (1999). *Teaching as a Learning Profession. Handbook of Policy and Practice*. New York: Jossey Bass.
- Day, C. (1997). In-service teacher education in Europe: conditions and themes for development in the 21st century. *Journal of In Service Education*, 23 (1), pp. 39-54
- Day, C. (1999). *Desenvolvimento Profissional de Professores*. Porto: Porto Editora (trad. de C. Day (1999). *Developing Teachers: the challenge of lifelong learning*. London: Falmer Press.
- Eurydice. (2004). *Key data on information and communication technologies in schools in europe*: European Comission.
- Fullan, M. (1995). The limits and the potential of professional development. In T. Guskey and M. Huberman (org) *Professional Development in Education*. Columbia Univ: Teachers College Press.
- Glathorn, A. (1995). Teacher Development. In: L. Anderson (ed) *International Encyclopaedia of Teaching and Teacher Education*. London: Pergamon Press.
- Harland, T. (2005). Developing a portfolio to promote authentic enquiry in teacher education. *Teaching in Higher Education*, 10 (3), 327-337
- Jonassen, D. (2000a). *Computers as mindtools for engaging learners in critical thinking*. Paper presented at the 3^o Simpósio Internacional de Informática Educativa, Viseu.
- Jonassen, D. (2000b). *Computers as mindtools for schools: Engaging critical thinking* (2nd ed.). Upper Saddle River, N.J.: Merrill.

MESO. (1998). *Final report 1998 – volume i - executive summary*: MESO: Observatory of Multimedia Educational Software.

Paiva, J. (2002). *As tecnologias de informação e comunicação: Utilização pelos professores*: Ministério da Educação - DAPP.

Peralta, H. (2002). *Qualitative research into tracing (elements of) current/perspective innovatory practices* (No. IPETCCO, Project: 87714 – CP – 1 – 2000 – GR – Minerva – ODL). Lisbon: Faculdade de Psicologia e de Ciências da Educação - Universidade de Lisboa.

Villegas Reimers; E. (2003) *Teacher professional development: an international review of the literature*. Paris: Unesco: International Institute for Educational Planning

Williams, D., Wilson, K., Richardson, A., Tuson, J., & Coles, L. (1999). *Teachers' ict skills and knowledge needs*. (Evaluative No. ERIC (ED 427 773)). Edimburgh: Scottish Office Education Dept.

Zeichner, K. & Wray, S. (2001) The teaching portfolio in US teacher education programs: what we know and what we need to know, *Teaching and Teacher Education*, 17, 613–621.

Zidon, M. (1996) Portfolios in preservice teacher education: what the students say, *Action in Teacher Education*, 18 (1), 59–70.

CHAPTER 2

**TEACHING AND LEARNING
STRATEGIES
IN RELATION TO THE USE OF
DIGITAL PORTFOLIOS**

TEACHING AND LEARNING STRATEGIES IN RELATION TO THE USE OF DIGITAL PORTFOLIOS

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Introduction

By creating this item (and group) there would or could be doubts about several strategies and Digital Portfolios. In some strategies, like the rather traditional knowledge-transfer-based-strategies, there is no place for digital portfolios. So the statements or questions are: are there teaching and learning strategies in which digital portfolios can enhance the quality, i.e. increase the efficiency and effectiveness of the learning process of the learners? And secondly: is the digital portfolio a strategy?

Underlying learning theories

Every teaching and learning strategy is founded on a learning theory. The most common learning theories are: behaviourism, cognitivism and (socio-) constructivism. A very good and brief description can be found by Brenda Mergel (1998):

Behaviourism

Behaviourism, as a learning theory, can be traced back to Aristotle, whose essay "Memory" focused on associations being made between events such as lightning and thunder. Other philosophers that followed Aristotle's thoughts are Hobbs (1650), Hume (1740), Brown (1820), Bain (1855) and Ebbinghaus (1885) (Black, 1995).

The theory of behaviourism concentrates on the study of overt behaviours that can be observed and measured (Good & Brophy, 1990). It views the mind as a "black box" in the sense that response to stimulus can be observed quantitatively, totally ignoring the possibility of thought processes occurring in the mind. Some key players in the development of the

behaviourist theory were Pavlov, Watson, Thorndike and Skinner.

Cognitivism

"Cognitive theorists recognize that much learning involves associations established through contiguity and repetition. They also acknowledge the importance of reinforcement, although they stress its role in providing feedback about the correctness of responses over its role as a motivator. However, even while accepting such behaviourist concepts, cognitive theorists view learning as involving the acquisition or reorganization of the cognitive structures through which humans process and store information."(Good and Brophy,1990, pp. 187).

(Socio-)Constructivism

Bartlett (1932) pioneered what became the constructivist approach (Good & Brophy, 1990). Constructivists believe that "learners construct their own reality or at least interpret it based upon their perceptions of experiences, so an individual's knowledge is a function of one's prior experiences, mental structures, and beliefs that are used to interpret objects and events." "What someone knows is grounded in perception of the physical and social experiences which are comprehended by the mind." (Jonasson, 1991).

If each person has his/her own view about reality, then how can we as a society communicate and/or coexist? Jonassen, addressing this issue in his article Thinking Technology: Toward a Constructivist Design Model makes the following comments:

"Perhaps the most common misconception of constructivism is the inference that we each therefore construct a unique reality that reality is only in the mind of the knower, which will doubtlessly lead to intellectual anarchy."

"A reasonable response to that criticism is the Gibsonian perspective that contends that there exists a physical world that is subject to physical laws that we all know in pretty much the same way because those physical laws are perceivable by humans in pretty much the same way."

"Constructivists also believe that much of reality is shared through a process of social negotiation..."

If one searches through the many philosophical and psychological theories of the past, the threads of constructivism may be found in the writing of such people as Bruner, Ulrick, Neiser, Goodman, Kant, Kuhn, Dewey and Habermas. The most profound influence was Jean Piaget's work which was interpreted and extended by von Glasserfield (Smorgansbord, 1997).

Learning Theories - Some Strengths and Weaknesses

What are the perceived strengths and weaknesses of using certain theoretical approaches to instructional design?

Behaviourism

Weakness - the learner may find themselves in a situation where the stimulus for the correct response does not occur, therefore the learner cannot respond. - A worker who has been conditioned to respond to a certain cue at work stops production when an anomaly occurs because they do not understand the system.

Strength - the learner is focused on a clear goal and can respond automatically to the cues of that goal. - W.W.II pilots were conditioned to react to silhouettes of enemy planes; a response which one would hope became automatic.

Cognitivism

Weakness - the learner learns a way to accomplish a task, but it may not be the best way, or suited to the learner or the situation. For example, logging onto the internet on one computer may not be the same as logging in on another computer.

Strength - the goal is to train learners to do a task the same way to enable consistency. - Logging onto and off of a workplace computer is the same for all employees; it may be important to do an exact routine to avoid problems.

Constructivism

Weakness - in a situation where conformity is essential divergent thinking and action may cause problems. Imagine the fun Revenue Canada would have if every person decided to report their taxes in their own way - although, there probably are some very "constructive" approaches used within the system we have.

Strength - because the learner is able to interpret multiple realities, the learner is better able to deal with real life situations. If a learner can problem solve, they may better apply their existing knowledge to a novel situation (Schuman, 1996).

What Works and How Can We Use It?

Behaviourism, cognitivism and constructivism - what works where and how do we knit everything together to at least give ourselves some focus in our approach to instructional design? First of all we do not need to abandon the systems approach but we must modify it to accommodate constructivist values. We must allow circumstances surrounding the learning situation to help us decide which approach to learning is most appropriate. It is necessary to realize that some learning problems require highly prescriptive solutions, whereas others are more suited to learner control of the environment (Schwier, 1995).

Jonnassen in Manifesto for a Constructive Approach to Technology in Higher Education ([On-line]) identified the following types of learning and matched them with what he believes to be appropriate learning theory approaches.

- *Introductory Learning - learners have very little directly transferable prior knowledge about a skill or content area. They are at the initial stages of schema assembly and integration. At this stage classical instructional design is most suitable because it is predetermined, constrained, sequential and criterion-referenced. The learner can develop some anchors for further exploration.*
- *Advanced Knowledge Acquisition - follows introductory knowledge and precedes expert*

knowledge. At this point constructivist approaches may be introduced.

- *Expertise is the final stage of knowledge acquisition. In this stage the learner is able to make intelligent decisions within the learning environment. A constructivist approach would work well in this case.*

What do we learn from the national reports?

Do the National Reports give indications to the application of underlying learning theories? This question seems interesting. If the digital portfolio-strategy is related to a certain learning theory, this would be mentioned by the project participants.

Summarized can be written that all national reports refer explicitly or implicitly to the application of the socio-constructivist learning theory. E-portfolio is often linked to an educational practice of teachers, based on this learning theory. It seems wise to spend attention to these facts in the formation for applicants. Our group searched further to find some indications about certain teaching and learning strategies in the countries Finland and Belgium, represented in the workgroup (Teaching and Learning Strategies). It may be logical that indeed models were found to stimulate teachers and lecturers to switch into a didactic process, funded or based on the socio-constructivist learning theories. We describe shortly the main essentials of these models: Seven steps to come to meaningful learning and the PAUZE-model.

Finish Contribution: Defining Meaningful Learning: Meaningful learning – seven dimensions

Activity. Student is an active person in the learning process. He/she takes part in creating the knowledge being studied and is responsible for his/her learning.

Constructivity. Activity is essential but insufficient for meaningful learning. We must reflect on the activity and our observations, and interpret them in order to have a meaningful learning experience.

Cooperation. Meaningful learning requires conversations and group experiences. Students learn there are numerous ways to view the world and a variety of solutions to most problems. Dialogue is very essential.

Intentionality. Human behaviour is naturally goal-directed. When students actively try to achieve a learning goal they have articulated, they think and learn more. Articulating their own learning goals and monitoring their progress are critical components for experiencing meaningful learning.

Authenticity. Thoughts and ideas rely on the contexts in which they occur in order to have meaning. Presenting facts that are stripped from their contextual clues divorces knowledge from reality. Learning is meaningful, better understood and more likely to transfer to new situations when it occurs by engaging with real-life, complex problems.

Self-direction. Student analyzes his/her own learning process and takes more responsibility of it.

Individuality. Students' previous knowledge, skills, motivation and other backgrounds influence learning and therefore they must be taken into consideration. The heterogeneity of students and their differences are significant starting point for meaningful learning.

These seven dimensions can be compared for example to meaningful learning defined by Jonassen et al. (1999). (Look: Jonassen, D., Peck, K. & Brent, W. 1999. Learning with Technology. A Constructivist Perspective. Prentice Hall).

According to Jonassen et al. (1999, <http://www.projecttime.org/about/meaningfulLearning.html>), meaningful learning is:

- **Active.** We interact with the environment, manipulate the objects within it and observe the effects of our manipulations.
- **Constructive.** Activity is essential but insufficient for meaningful learning. We must reflect on the activity and our observations, and interpret them in order to have a meaningful learning experience.
- **Intentional.** Human behavior is naturally goal-directed. When students actively try to achieve a learning goal they have articulated, they think and learn more. Articulating their own learning goals and monitoring their progress are critical components for experiencing meaningful learning.
- **Authentic.** Thoughts and ideas rely on the contexts in which they occur in order to have meaning. Presenting facts that are stripped from their contextual clues divorces knowledge from reality. Learning is meaningful, better understood and more likely to transfer to new situations when it occurs by engaging with real-life, complex problems.
- **Cooperative.** We live, work and learn in communities, naturally seeking ideas and assistance from each other, and negotiating about problems and how to solve them. It is in this context that we learn there are numerous ways to view the world and a variety of solutions to most problems. Meaningful learning, therefore, requires conversations and group experiences.

Wiske (1998) provides another perspective about meaningful learning with a focus on subject matter content. She calls for teaching subject matter that is:

- Central to the domain or discipline. Every academic discipline has elements that are regarded by those in the field as the ideas and methods of inquiry that are central and controversies that are enduring. Teaching aimed at meaningful learning encompasses these aspects.

- Accessible and interesting to students. Topics must be significant from a student's perspective. Teaching about the Monroe Doctrine, for example, must enable students to make meaning from its tenets in the here and now.
- Exciting for the teacher's intellectual passions. For a topic to be generative, the way it is taught is as important as the substance. The teacher's curiosity, zeal and genuine wonder are infectious and serve as a model for students to imitate.
- Easily connected to other topics, whether inside or outside the discipline. Students benefit most when they can link their previous experiences and knowledge to other important ideas.

Belgian Contribution: The PAUZE-model for teaching and learning

The Flanders-education-decree of 1996 had competence learning as a basic assumption. The Katholieke Hogeschool Limburg developed a teaching and learning model, called the PAUZE-model:

- Pauze: Focusing on the Person (Student-centered education).

The first and most important tool for a teacher is his/her own as personality with cognitive and affective skills. Not only for his/her own, but also for the students is that the most important starting point for development. Every student has to get grip on his own in confrontation with the expectations of the society, the schools and the formation. A reflection on his experiences as student, on what he does, on what he can effectively and can't, on what he believes and on who he really is, are aspects of student-centred-education.

- pAUze: Authentic functioning and learning (see above Jonsassen, 1999).
- pauZe: Self-directed learning

A process in which students take the initiative to diagnose their learning needs, formulate learning goals, identify resources for learning, select and implement learning strategies, and evaluate learning outcomes. The role of the instructor shifts from being the 'sage on the stage' to the 'guide on the side' in a self-directed learning environment.

This kind of learning is built upon a learning growth that can be summarized as follows:

1. Learning in an environment in which the student gets learning goals and learning materials.
2. Learning in an environment in which the student gets learning goals, but searches for learning materials.
3. Self-directed learning in an environment in which the student formulates himself the learning goals and searches himself for appropriate learning materials.

- pause: Emancipatory

Teacher training offers students basic competences for their job. A teacher should after the initial teacher training be capable of learning out of own experiences on a independent and self-directed way.

Conclusion

The socio-constructivist learning theories presented in this article can be seen as flexible and suitable guidelines to implement learning processes based on digital portfolios, which in fact support and have a great impact on learners' activity and self-directedness. While processing their own digital portfolios students construct both their individual and shared expertise, likewise they can better engage their learning processes into real-life situations. It should, however, be realised that whenever a teacher uses digital portfolios, there is also needed a deep and strong engagement to socio-constructivist way of thinking and teaching.

Summarized can be written that for the assessment and the developing of students educated especially in Belgium and Finland and also in general in Europe when (socio-) constructivism is applied as learning theory, the digital portfolio is a very useful tool to guide learners in their learning process because the digital portfolio offers the possibility to get to know themselves and to develop their competences.

References

Jonassen, D.H., Peck, K.L., & Wilson, B.G. (1999) *Learning with technology*. Upper Saddle River, NJ: Merrill Publishing.

Jonsassen e.a.,
<http://apu.gcal.ac.uk/clti/papers/TMPaper11.html>

Katholieke Hogeschool Limburg, the Pauze-Model, (2001), not published.

Mergel B., (1998), *Learning Theories of Instructional Design*, University of Saskatchewan.

Retrieved from:

<http://www.usask.ca/education/coursework/802papers/mergel/brenda.htm>

Sinke G.H.,
<http://www.competentonderwijs.nl/Anderslerenandersorganiseren.htm>

Wiske, M.S. (1998). What is teaching for understanding? In Wiske, M.S. (Ed.) *Teaching for understanding: Linking research with practice*. San Francisco: Jossey-Bass Publishing.

CHAPTER 3

LEARNING ASSESSMENT

LEARNING ASSESSMENT

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Traditional assessments

Traditional assessments, which are made according to a student's memory of the messages given by instructors, are unable to effectively measure the results of these two learning theories. The changes in the student's cognition and learning process, involvement and interaction have become the new foundation for learning effect assessment. Traditional assessment does not effectively measure a students' ability to organize relevant information or present a coherent argument and lack sensitivity to the individual growth that teachers desire in students. Therefore, when traditional assessment is unable to effectively reflect a student's learning process, there is a need for new types of assessment. In response to the needs of the new learning theories such as constructivist learning, and to overcome the inadequacy and limitations of traditional assessments, new assessments come out one after another in various forms and names. Portfolios have attracted much attention as an alternative to traditional assessment (Cole et al. 1995).

Constructivist learning

The constructivist approach to teaching and learning is based on a combination of a subset of research within cognitive psychology and a subset of research within social psychology, just as behavior modification techniques are based on operant conditioning theory within behavioral psychology. The basic premise is that an individual learner must actively "build" knowledge and skills (Bruner, 1990) and that information exists within these built constructs rather than in the external environment. However, all advocates of constructivism agree that it is the individual's processing of stimuli from the environment and the resulting cognitive structures, that produce adaptive behavior, rather than the stimuli themselves (Harnard, 1982).

A constructivist approach to the method of assessment and learning theory was considered essential to the unit's success. According to Funderstanding (1998) using the constructivism approach ensures that students don't simply regurgitate someone else's right meaning but allow students to construct their own meaning of the evaluation process and to make assessment part of the learning process.

According to constructivist learning theory knowledge should not be accepted passively, it should be actively constructed by cognition. Therefore, instead of using simple knowledge instruction, an instructor should be a facilitator and adviser of instruction to help learners create a knowledge construction environment. The instructor should give guidance and support, in order to help learners become actively involved in the learning process and construct their own knowledge. (Chang 2001,1).

Bruner (see Kearsley, 1999) provides the following principles of constructivist learning:

1. Instruction must be concerned with the experiences and contexts that make the student willing and able to learn (readiness).
2. Instruction must be structured so that it can be easily grasped by the student (spiral organization).
3. Instruction should be designed to facilitate extrapolation and or fill in the gaps (going beyond the information given).

Social-constructivism

Social-constructivism is one way to support students learning process. Social constructivism views each learner as a unique individual with unique needs and backgrounds. The learner is also seen as complex and multidimensional (Gredler 1997). Social constructivism not only acknowledges the uniqueness

and complexity of the learner, but actually encourages, utilizes and rewards it as an integral part of the learning process (Wertsch 1997).

Gredler (1997) also emphasizes the importance of the background and culture of the learner. Social constructivism encourages the learner to arrive at his or her own version of the truth, influenced by his or her background, culture or embedded worldview. Historical developments and symbol systems, such as language, logic, and mathematical systems, are inherited by the learner as a member of a particular culture and these are learned throughout the learner's life. These symbol systems dictate how the learner learns and what is learned (Gredler 1997). This also stresses the importance of the nature of the learner's social interaction with knowledgeable members of the society. Without the social interaction with other more knowledgeable people, it is impossible to acquire social meaning of important symbol systems and learn how to use them. Young children develop their thinking abilities by interacting with adults. From the social constructivist viewpoint, it is thus important to take into account the background and culture of the learner throughout the learning process, as this background also helps to shape the knowledge and truth that the learner creates, discovers and attains in the learning process (Gredler 1997; Wertsch 1997).

The responsibility for learning

It is argued that the responsibility of learning should reside increasingly with the learner (Von Glasersfeld 1989). Social constructivism emphasizes the importance of the learner being actively involved in the learning process, unlike previous educational viewpoints where the responsibility rested with the instructor to teach and where the learner played a passive, receptive role. Von Glasersfeld (1989) emphasizes that learners construct their own understanding and that they do not simply mirror and reflect what they read. Learners look for meaning and will try to find regularity and order in the events of the world even in the absence of full or complete information.

Sharing information

The portfolio should be learner-centered. That is a framework enabling each learner to access a common electronic platform to create and continuously improve a personal portfolio. The portfolio should be accessible by all learner stakeholders: teachers, parents, prospective evaluators, etc. (Sjunnesson

2002.) When students have done their task or part of their task they put their task to a common platform so that also other students can see what they have done. That way they can learn things from each others assessment answers. They can also give feedback and share information with each other. That way the teacher is not the only one who gives information. Sharing information and giving feedback deepens the learning process.

Portfolio assessment

Portfolio assessment is an example of an authentic, performance or alternative assessment technique. According to Nilsson (2001) portfolio assessment was developed already in 1930s but was forbidden in favor of quantitative methods. The contents in these assessment techniques should be related to real life problems and solutions it is said from their proponents. Many speak of advantages with portfolio assessment, and point out that portfolios promote:

- Production rather than reproduction
- Long term evaluation rather than short term testing
- Width in documentation
- Individualization (Ellmin 1999, 121-132).

Allowing students to decide upon the content of a task, a project or an exercise will likely increase their motivation and acceptance of the assessment. Specifically, the ownership of a task or exercise is a major factor in strengthening the authenticity of an assessment (Reeves & Okey 1996). Allowing students to have decision-making power about the selected artifacts may make the students feel ownership of the portfolio. (Cole et al.1995). Authentic assessment aims to demonstrate students' authentic learning processes monitor their growth and reflect observation of their current works.

When thinking about learning assessment as related to digital portfolio there are some points that are important to keep in mind. The aims of the course direct the assessment. Every bigger and smaller assessment helps the student to reach the goal. It's important that the vision and goals are clear to the instructor and also to students. That way students can understand why they are doing assessments. That increases their motivation and helps them to see the bigger global picture.

Assessments are the "Backbone" of the course. When thinking about suitable task it's important to remember that every task should support the achievement of learning goals. Tasks are not self-valuing by themselves. Their role is to help the student to learn, not just doing task for practice reasons. Bigger assessment can be split to smaller ones. That way for students it might be easier to accomplish the goals. Instructions from the teacher are important. In every task there should be basic guidelines for the task but not too strict. There should also be space for the students' own thoughts and the way he/she presents things.

Portfolio assessment focuses on the collection of multidimensional data in order to understand the learning and changes in learners, as well as stimulating involvement and self-assessment in learners through the interaction and discussion of the portfolio. Portfolio assessment not only provides true and rich information for reflecting and assessing the true performance and achievement of learners, but it also helps students engage in meaningful learning. (Chang 2001) Farr and Tone (1994) argue that the main goal of portfolio assessment is to facilitate students as self-assessors so that they can monitor and evaluate the effectiveness of their learning process and outcomes.

Traditional portfolio assessment relies on manual data collection and a writing-centered learning process. The difficulties in data storage, search and management after long-term implementation have become a problem in the development and implementation of portfolio assessment (Mullin 1998; Niguidula 1993; Smith & Tillema 1998).

Fortunately, the impact of computer technology has facilitated the production of electronic or computer-based portfolios, which not only solves the problem of huge amounts of data storage, but also enables students to combine text, pictures, images and sound to present richer and more diversify file content through multimedia. In addition, computer technology is a great aid to data collection, update and management of electronic portfolio (Lankes 1995).

The great value of the digital portfolio is in self- reflection. Hackney (1999) asserts therefore, the creation of the portfolio should take into account the highly individualized nature of the

process with the emphasis on how one examines oneself, what value is placed on artifacts and their representation of work completed and what rationale is used to support the artifact as a reflection of personal growth.

Effort regulation

Effort regulation is the ability to maintain focus and effort towards goals despite potential troubles. Effort regulation reflects a commitment to completing one's learning goals. Effort regulation is more generally associated with a belief in effort-outcome co variation which in general is the belief learning is caused by personal effort and not personal ability luck or task difficulty. (Wade, Abrami, Sclater 2005, 3).

Portfolios can provide evidence of student self-regulation. Students may review their own work and then reflect their outcome. The process of reflection is what makes portfolios a tool for life-long learning and process rather than a mere collection of work. (Foote & Vermette, 2001). The student needs to be able to explain why he has put certain element within the portfolio. Portfolios prompt students to look back to digest and reflect happened so that they can set new goals and determine next steps (Camp 1992.) Sweidel (1996) asked students self-reflective questions about their study strategies and found that they were able to identify relationships between the process and the outcome of their studying.

Wade and Yarbrough (1996) elaborate on the pedagogical value of using portfolios as a learning tool. Portfolios should not be short-term goal attainment since they are the culmination of long term learning outcomes. Portfolios are also interactive in that their work with their teachers and peers, thus seeking guidance or suggestions.

Colleagues, parents, school administrators and other stakeholders have to know that the portfolio assessment deliver the same, or better, results as regular testing. Making portfolios is not necessarily easier than taking test. Structuring portfolio development needs as much criteria ad procedures as without (Sjunnesson, 2002).

Evaluation

Evaluation is one important part of learning assessment. Evaluation can be seen at least from three different perspectives: the student point of view, the teacher point of view and other students' point of view. From the student point of view it's important that he/she understands that he/she is doing the assessment for himself/herself. Self-reflection is very important. By reflecting the assessment during the process and after the assessment has finished he/she can understand and learn new things. Reflections can help the student understand the tasks content information, as it can also help the student to learn about the process, how to do things better next time etc. From the teacher point of view evaluation is one way to give feedback to the student. That is also advantageous to control that the student has done the given tasks. From the other students' point of view evaluation is one way to give feedback to the students. By evaluating other students' assessment they can also learn new things.

Important for all evaluation strategies are the goals towards the learners are striving. The teacher and student must set the goals together or otherwise the portfolio does not become the student's own. Goals have to be made clear and relevant, a hard process at first for both teachers and students, going down to the nitty-gritty of practical decisions and productions (Sjunnesson, 2002). Portfolio is a lifelong learning tool. In the evaluation stage students compare their reflections to their achievement standards and indicators and set learning goals for the future (Wade, Abrami, Sclater, 2005.3).

When portfolios are being used for evaluation and assessment, a new relationship in teaching is for most part needed between the teacher and the pupils/students. The teacher can adapt the teaching better if he/she sees learning results presented in portfolios. Teachers need also, of course to set reasonable and clear goals, and support the pupils' portfolio development. The first hard obstacle though is to persuade the pupils that it really is their own portfolio, not primarily a collection for teachers to grade, discuss and evaluate. This tension between common standards and individual creativity is crucial to overcome for development of quality learning portfolios (Sjunnesson, 2002).

School curriculum broken down to short-term goals per semester may form one kind of school portfolios. Another particular piece in portfolio learning is a table of standards or a checklist on what the student needs to work more on in relation to goals. Comments from the student ensure that what is lacking is seen as well as what is fulfilled (Sjunnesson, 2002).

References

- Bruner, J. (1990) *Acts of meaning*. Cambridge, MA: Harvard University Press.
- Camp, R. (1992). Portfolio reflections in middle and secondary school classrooms. In. K.B. Yancey (Ed.), *Portfolios in the writing classroom* (pp. 61-79). Urbana, Illinois: National Council of Teachers of English.
- Chang, C.(2001). *Construction and evaluation of web-based learning portfolio system: an electronic assessment tool*. IETI 38 (2), 144-155.
- Cole, D., Ryan, C. & Kick, F. (1995). *Portfolios across the curriculum and beyond*, Corwin Press, Thousand Oaks, Ca.
- Ellmin, R. (1999). *Portfolio*. Stockholm: Gothia.
- Farr, R. & Tone, B. (1994). *Portfolio and performance assessment: Helping students evaluate their progress as readers and writers*, Harcourt Brace College Publishers, Fort Worth, TX.
- Foote, C.J. & Vermette, P.J. (2001). *Teaching portfolio 101: Implementing the teaching portfolio in introductory courses*. Journal of Instructional Psychology, 28(1), 31–37.
- Funderstanding (1998). *About learning / theories. How do people learn?* Constructivism.
- Available online:
www.funderstanding.com/learnin_theory_how1.html
- Gredler, M. E. (1997). *Learning and instruction: Theory into practice* (3rd ed). Upper Saddle River, NJ: Prentice-Hall.
- Hackney, C. (1999). *Three models for portfolio evaluation of principals*. Schools administrators 56 (3), 36.
- Harnad, S. (1982). Neoconstructivism: A unifying theme for the cognitive sciences. In T. Simon & R. Scholes (Eds.), *Language, mind and brain* (1 - 11). Hillsdale NJ: Erlbaum.
- Kearsley, G. (1994, 1999). *Explorations in learning & instruction: The theory into practice database*. Washington, DC: George Washington University.

Available online: <http://www.gwu.edu/~tip/>

Lankes, A. (1995). *Electronic portfolios: A new idea in assessment*. ERIC digest EDO-IR-95-9.

Available online: <http://ericir.syr.edu/ithome/digest/portfolios>.

Mullin, J (1998). *Portfolio: purposeful collection of student work, new directions for teaching and learning*, 74, 79-87.

Niguida, D. (1993). *The digital portfolio: A richer picture of student performance*, Eric document reproduction service no, ed. 400 261.

Nilsson, L. (2001). *Ett ramverk för en discussion om datormedierade lärmiljöer*. Skolberket: Stockholm.

Reeves, R. & Okey, J. (1996). Alternative assessment for constructivist learning environments. In Wilson, B. (ed.) *Constructivist learning environments: Case studies in instructional design, educational technology publications*, Englewood cliffs, NJ, pp. 191-202.

Sjunneson, J. (2002). *Digital learning portfolios: inventory and proposal for Swedish teacher education*. DRHumR 3/2002.

Smith, K. & Tillema, H. (1998). *Evaluating portfolio use as a learning tool for professionals*, Scandinavian journal of educational research, 42, 2, 193-205.

Sweidel, G.B. (1996). *Study strategy portfolio: A project to enhance study skills and time management*. Teaching of Psychology, 23(4), 246–48.

Von Glasersfeld, E. (1989). *Cognition, construction of knowledge and teaching*. Synthese 80, 121–140.

Wade, A., Abrami, P. & Sclater, J. (2005). *An electronic portfolio to support learning*. Canadian journal of learning and technology.

Wade, R.C., & Yarbrough, D.B. (1996). *Portfolios: A tool for reflective thinking in teacher education*. Teaching and Teacher Education: An International Journal of Research and Studies, 12(1), 63–79.

Wertsch, J. (1997) *Mind as Action*. London: Oxford University Press.

CHAPTER 4

**TEACHER PROFESSIONAL
DEVELOPMENT AND DIGITAL
PORTFOLIOS**

TEACHER PROFESSIONAL DEVELOPMENT AND DIGITAL PORTFOLIOS

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1. Teacher competences within the European context

Regarding the context of the activities (designing a digital portfolio for European teachers) within our project, we would like to put national trends into a European context. This context is the context of European decisions and decrees, results of European working groups, being the basis for decisions and decrees at a national state level. European measures are many times going along with scientific trends, pilots and research projects e.g. in the field of education and pedagogy.

Taking a look at European Education documents one of the starting documents and actions was the Bologna Declaration (1999). The Declaration made possible that European institutions, which have adopted the Bachelor-Master Degree system for Higher Education, in future can compare their programs based on an outbalanced credit system. Without disregarding the diversity of each country, these institutions are promoting mobility within Europe for students and teachers and European co-operation in quality assurance, just to mention the most important features. It is the basis for what is now called the “The Bologna Process”.

In Lisbon (2000) “the Heads of State and Governments, conscious of the upheaval caused by globalisation and the challenges inherent in a new, knowledge-based economy, set a new objective for the Union for the decade ahead: that of becoming “the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion”⁵.

⁵ http://europa.eu.int/comm/education/policies/educ/bologna_en.html

For higher education the next step was to give Higher Education standards. These standards (the Dublin Descriptors 2002; enlarged with the descriptors for the Doctoral Degree in 2004) were necessary e.g. in order to compare the European credits. Dublin descriptors are standards and qualifications. Concepts of the professional and his competences were introduced and in the meantime all member states are working with the descriptors to standardize their institutions for higher education.

Then there is the sub-report as an elaboration of “Lisbon 2010” on “Education and Training 2010” as part of the so-called Lisbon Strategy. Since 2004 and under the above mentioned Lisbon Strategy the key word is Lifelong Learning. All kind of working groups of the Commission are concentrating on that in order to achieve the goals of ‘Lisbon 2010’. It is in these years that the Commission is starting to focus more and more on the teacher profession realizing that s/he is one of the key actors in realizing any success. One of the key documents is: “Common European Principles for Teacher Competences and Qualifications” (CEP, 2004)⁶.

The Commission organised a so-called testing conference to find out if there was a common basis for this document: “The testing conference considered the extent to which there was, or could be, a European consensus on how best to support and train teachers”.⁷ June 2005. This report on the conference ends with the following:

“In early 2006, the Commission will table a proposal for a recommendation of the Council and the Parliament on the quality of teacher education which will invite national authorities to use the common principles as a reference point in the development policies on teacher education on the understanding that there is a widespread consensus that they are seen as appropriate and relevant to teacher education.”

⁶ http://europa.eu.int/comm/education/policies/2010/doc/principles_en.pdf

⁷ <http://europa.eu.int/comm/education/policies/2010/doc/confreport.pdf>

To promote the development of the quality and efficiency of education across the Union, the European Commission has set out common European principles for teacher competences and qualifications. According to the common European principles, teachers' profession is considered:

- a well-qualified profession
- a profession placed within the context of lifelong learning
- a mobile profession and
- a profession based on partnerships.

The key competences of a teacher presume teachers to be able to:

- work with others
- work with knowledge, technology and information
- work with and in society.

Teachers' development toward these key competences is a lifelong learning process, including initial teacher education, induction and continuing professional development (CEP, 2004). To be able to develop their professional competences, teachers like other citizens, need competences for lifelong learning. According to the framework devised by the Commission (KCKBS, 2005), there are eight key competences needed for a successful life in a knowledge-based society. They are:

- communication in the mother tongue
- communication in a foreign language
- mathematical literacy and basic competences in science and technology
- ICT skills
- learning-to-learn

- interpersonal and civic competences
- entrepreneurship and

- cultural awareness.

Each of the above-mentioned competences is considered to be a combination of skills, knowledge, aptitudes and attitudes, and to include disposition to learn as well as know-how.

Finally – for those interested – the Commission published an overview of all important documents in within the Bologna process and the integrated framework “Education and Training 2010”⁸:

2. Teacher professional development

The nature of educational professional work has changed dramatically in recent years. It involves far greater pressure, more complex and ill-structured problems, and greater uncertainty than ever before. A group of experts for whom these defining aspects of work especially apply are teachers in different educational level.

The drastic changes in teachers’ professional work contain also the aspect of schools being a part of the Information Society. As we all know ICT (Information and Communication Technology) is an important part of modern life. It is obvious that the workers of Information Society need different kind of skills than workers twenty years ago. Students are living in the centre of the Information/media Society. The world is different from the point they are looking at it.

It is obvious that children in the Information/Media Society will need tools to handle all the information and all the media accessible. At school level one of the signs is that education aims to take into account individual learning. This meant that product-orientated methods and tools were constructed to the educational institutions without considering the requirement of process-orientated solutions. In the near future education will be targeted to individual needs replacing the mass production offerings. Open content will act in a certain role for customizing learning. This means that the schools will be more like learning resource centres which prepare learners to learn by using new information and communication technology. In school level it means less content-orientated teaching and more skills and

⁸ http://europa.eu.int/comm/education/policies/2010/doc/compendium05_en.pdf

competence-based learning with the ethic of wrong and right. Basically, schools have a very important role to develop the skills needed by students.

During the last fifteen years there has been a large volume of initiatives and research concerning the use of ICT (Information and communication technologies) in teachers' work all over the EU. However, the impact or the results achieved are not so great at the moment. It is worth re-emphasizing that none of these strategic interventions will have any impact without the adequate provision of an acceptable quality of ICT access and technology to school teachers and schools.

From the capacity building point of view, districts should provide a variety of opportunities for teacher training (both pre- and In-service training) and development, ranging from district-sponsored in-service activities to financial support for professional conferences. The intent of such activities is to help teachers develop knowledge and teaching skills, greater understandings of school functions and responsibilities and of course greater confidence in their roles as educators.

There has been a lot of talk about the importance of cooperation in school level to distribute the "good practises" wider. Time will pass before the educational reform has real impact on teaching and learning methods. It is essential to see that before any practical changes he/she has to be aware of the possibilities and he/she has to have information needed to get to know the strengths and weaknesses of the certain issue. At school level (concerning new pedagogical methods), one good way to have adequate information (expect literature) is cooperation with other colleagues.

Strategies for capacity building intend to build new collaborative capabilities and skills for teachers. Basic idea is that the amount of information in the information society cannot be handled by the teacher only by himself. Collaborative working methods bring new aspects to the learning process. Understanding of the meaning of new ways of collaboration will make the boundaries between formal and informal learning harder to draw. Some basic skills will be information skills (because of the character of changing information). This will follow to the new practises for knowledge building among

creative workers. Below there is a picture which illustrates the change process of professional development (Fig. 1).

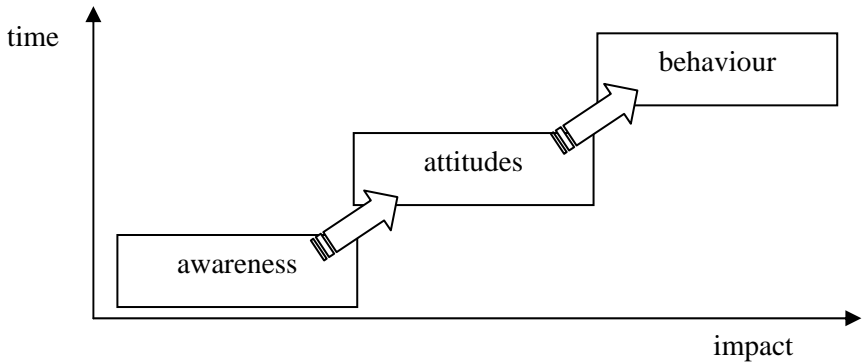


Figure 1
The change process of professional development

Facilitating informal learning in the workplace

Informal learning is an important way that individuals construct meaning from their experiences. This type of learning is triggered by a divergence between persons' history of experiences and new experience that cannot be handled automatically. In a recent study of informal learning among public school teachers, Lohman (2000) found that teachers associated three main types of informal learning activities with reflective learning outcomes:

- knowledge exchanging (sharing and reflecting others practise)
- experimenting (trying out new ideas/methods)
- environmental scanning (gathering data /information from sources outside the school).

Therefore, if teachers rely on informal learning activities for their professional development and if the nature of the organizational environment influences their participation in these types of activities, we have to know more about the

environmental influences that inhibit teachers from participating in informal learning.

As a study framework there are conclusions based on the Lohman's study (2000):

- 1) Lack of time of learning. In many cases greater numbers of learners with special needs were being integrated into the classrooms and teachers have to deal with the integration and the challenges the integration presents in everyday work. In this conclusion is included the concept of lack of non-teaching time.
- 2) Lack of learning resources. Teachers have been lacking proximity to very important learning resources in education: other teachers' classrooms, computer technology and libraries. The access to the computers is one key question nowadays.
- 3) Lack of meaningful rewards for learning. Teachers are involved in many non-teaching activities (student clubs, mentoring teachers etc.) which can be a great way to gather new ideas about teaching and learning (like sharing their expertise with others). However, those teachers who have been involved in this kind of activities have received few, if any extrinsic rewards for participating in these activities.

To minimize the influence of these three conclusions, the following strategies are proposed. First, increase the unencumbered time of learners to provide greater freedom to participate in informal learning activities. Secondly, reducing the physical distance between learning resources and learners to increase efficiency with which resources are accessed. Thirdly, related strategy is to expand access to communication technology as a means of improving the efficiency of

information gathering activities, especially when close physical proximity to resources is not feasible.

Presently, in addition to teaching responsibilities, the decentralization of decision making in schools and districts calls for teachers to play active role in the capacity building and how to manage it. Fullan (2006) says that sustaining reform is the most difficult aspect of all change efforts. As recognized, we are living in the Information Society. From the teachers' professional development point of view the key factor will be the perspective of the use of ICT: Will the pedagogical use of ICT be seen as a part of teachers' professionalism in 21st century or will it be seen as a technology and tricks? At school level there will be a huge gap between schools from a professionalism point of view. Which school is the one you put your children to learn and to get competence needed in the Information Society?

3. Teacher education models and types of teachers

Despite the apparent agreement that teachers need concrete training for the use of technologies in education, no general agreement exists on what they must learn and how they must be prepared (Willis & Mehlinger, 1996).

One of the sources of disagreement comes from the fact of the use ICT in teacher education programmes is a new and emergent study area that it is influenced and reflected also by the different theoretical views of Sciences of Education.

In other words, if the theoretical frameworks and the respective ways suggested to prepare teachers can vary drastically from teacher education program to teacher education program, this will also be reflected in the ways of understanding the use of technologies (Willis & Mehlinger, 1996), with obvious problems if a clear and consistent vision of the computer role in education will not be constructed.

Although running the risk of dichotomy, we can say that two opposite paradigms of teacher education programs exists: a) one that sees the teacher "equipped" with the "good answers" for all the pedagogical situations; b) another one that sees it capable "to read" each one of the situations and to answer adequately to

the uncertainty that characterize most of the teaching and learning situations and contexts.

In the first case, a professional's main strategy would be the reproduction of solutions previously thought and learned during the training courses, while a strategy based on the construction of solutions for the problems would be more appropriate for the second case. A "reproductive" teacher, without great intervention on an creative point of view, where everything would be foreseen, in opposition to a teacher "author" of its practices, with great autonomy and capacity of decision about the best ways of acting in each concrete situation.

According to Willis & Mehlinger (1996), in the competency based courses of initial teacher education where the main goal is to prepare teachers to give the "good answers" to the pedagogical problems, an adequate use of the technologies will be, for example, the use of simulations. According to these authors, in this model of teacher education, the teacher preparation occurs in well structured environments and teaching is seen, over all, as "a process of identification of problems and application of the appropriate solutions." (p. 989).

Accepting that the pedagogical conceptions of the teachers determine how they use the technologies, and thinking that the teacher education model used will be (with great probability) the teaching model adopted by the teachers, in this perspective the computers are seen mainly as machines supplying information and, in some way, understood as substitute of teachers. Like in programmed education, tutorials or intelligent tutors, the main idea is not just to supply information and to control the learning, but making it in a such directed way, very closed and without great power of decision of the users.

By the contrary, in a constructivist view of teacher education, the use of the technologies will be very different. Mainly because the teaching activity is seen as a complex activity where it is difficult to anticipate and preview all the situations that in one concrete context can occur. In other words, teaching is understood as an activity that demands the knowledge not only on what to do, but also, the capacity to know how and when to use this information for the resolution of the emergent problems and situations not foreseen. As Risko write (1991, p.121) cited by Willis & Mehinger (1996), "Teaching is a

complex cognitive skill and ... teaching, occurring in relatively ill-defined environments, requires not only knowledge about what to do but the ability to know when and how to use this information when confronted with problems and unexpected situations.”

Not being possible to preview and anticipate all the situations and problems with which the teacher will be faced, an adequate teacher education model would not be a model organized around a repertoire of specific skills, or either, the memorization of a set of “correct answers” for the different situations of the professional activity.

The goal will not therefore be to make teachers who have the answers for all the contingencies of the lesson, but to prepare professionals to understand the involving reality, to construct themselves the knowledge and to acquire the necessary professional abilities, as a result of the richness of the stimulus of environments where they are integrated: ill-structured environments, full of problems and questions for which it does not have answers previously prepared and where teachers can practise and reflect on their performance (Schön, 1983, 1987, 1991), with the aid and orientation, for example, of supervisors and teachers with more experience.

The way how to approach the "context of the practical professional" will be, in practice, the aspect that differentiates finally the two perspectives. In the case of a constructivist perspective, there are a lot of suggestions in literature that can help us to equate the options to the use of digital portfolios:

- Tools that teachers can use, for example, to search, to analyze, to structure and to elaborate information (Papert, 1997);
- Tools that allow the active involvement of the students in the resolution of problems and taking decisions in virtual environments express created for that goal (Risko, 1991; Bransford, Brown & Cocking, 1999) or in the exploration, under multiple perspectives, of different situations of real work of the teachers giving them a rich and deep understanding of the questions of the practice and the knowledge

allows answering them (Cognition and Technology Group, 1990);

- Tools to develop the capacity of analysis and diagnosis, on the basis of "real cases", for example, on the ways as students think and react to the different work strategies.

Perhaps the most important aspect in this perspective is the development of the capacity to create new chances of the curricular point of view, bringing real and authentic problems to the classroom, putting students to explore them (Bransford, Brown & Cocking, 1999). Using "cases", but also using real situations or the connection to other professionals and scientists in different fields, working together and sharing tools, methodologies and experiences (collaborative learning) can be excellent examples.

In accordance with Newby (1996), in this learning perspective the paper of the teacher is over all to place "good" problems, to create activities of collaborative learning and to guide (shape) the student on the process of knowledge construction. The modelling process has a key importance because, as noticed by Bransford, Brown & Cocking (1999), "When teachers learn to use a new technology in their classrooms, they model the learning process for students; at the same time, they gain new insights on teaching by watching their students learn."

According to these authors, actually, the introduction of the ICT in the classroom offers insights on the role of the teachers giving them space to be able to try, stimulating the reflection on the processes of learning, rethinking on its perspectives of learning or, more specifically, on what it is learning with technology.

4. The meaning of ICT and digital portfolios in teacher professional development

The knowledge based society is to be built on eight key competences (KCKBS 2005). The key competences should have been developed by the end of compulsory school or training and should act as a foundation for further learning as part of lifelong Learning (KCKBS 2005). It is the reason why their

mastering has to be a part of teachers' professional training and development. The development of an ePortfolio involves considerable competences and abilities in terms of literacy (Attwel 2005, p.4), communication, using ICT, self-management, social, intercultural, interpersonal and civic awareness, entrepreneurship and cultural identity. In this relation it looks as a very convincing argument that digital portfolios can be used as the unique supporting *tool* just for the development or improvement of these key competences, (i.e. in Communication in the mother tongue, Communication in a foreign language, Science, math and technology, ICT skills, Learning-to-learn, Interpersonal, civic and social skills, Entrepreneurship and Cultural awareness as a part of intercultural skills).

Essential issues in the use of digital portfolios for professional development

In her doctoral dissertation, Finnish researcher Marja Kankaanranta conducted an action research project on the use of digital portfolios for assessing and developing the pedagogical practices of childhood education. In the study, digital portfolio development combined two related processes, the evolvement of capabilities in ICT and portfolio development. Kankaanranta found out that sufficient *access to computers and peripherals* is a necessary prerequisite for the continuous development of the pedagogical use of ICT. It was confirmed that teachers need to have a sound technological basic competence to be able to utilize ICT in their own work.

However, the most crucial issue was to have enthusiasm and an experienced need for experimenting with new things provided by information and communication technologies as well as a genuine desire for learning (Kankaanranta, 2002).

In addition to access, ICT capabilities and desire for learning, there are several other significant design and implementation issues that influence the sustainable use and development of portfolios by teachers. It was discovered that the most important issues are the definition of the purposes for digital portfolios, consideration of the context and meaning of institutional culture, provision of support for teachers,

development of user-friendly technological tools, collaboration in the portfolio design and implementation, and reflection on ethical issues. It became evident during the action research process that teachers' collaborative reflection was an essential part in all cycles of portfolio development. A portfolio provides a means to make collaborative reflection visible and sharable with others (Kankaanranta, 2002).

A key aspect in the development and effective use of digital portfolios for professional learning is motivation. Some studies (e.g. McCoy & Barrett, 2004) indicate that teacher candidates often regard production of portfolios as a compulsory task and not as a lifelong learning strategy. If the goal of the teacher education programs is to support internal motivation to use portfolios for continuous professional development, the institution should allow candidates to control the content, purpose and process of the portfolio development. (see Barrett & Wilkerson, 2004).

5. Implications for teachers' training

Teachers' challenges and success factors of digital portfolio usage

Although a strong consensus exists today on the relative importance and relevance of the computers for educational purposes, there seems to be a concern due to its feeble use and difficult integration in the different areas of school work, with special attention to the curricular activity (OCDE, 2005; Plomp & Perlgrum, 1991; Simmons & Wild, 1991).

One of the main reasons pointed out for that is the lack of preparation of the teachers or an inadequate preparation. Nevertheless, when inquired directly, teachers show a favourable attitude and a bigger interest for its pedagogical use (Paiva 2002, 202).

Actually, what teachers seem to say is that they understand the importance of the computers in the society of our days and that they would like also to use them in curricular activities with their pupils, but they do not know how to do it in a concrete way. Considering that, we think that it is exactly in that area that we must point out the strong points of the DigiFOLIO project. Bearing in mind that one of its goals is the development

of a program for teacher education using an innovative strategy of work - the use of portfolios -, we stress out the adoption of digital technologies in its implementation.

Before thinking about the aspects related with the use of technologies and types of possible uses (topic that will be treated elsewhere), it will be important to make some reflections on the "type of teacher" that will be more adjusted to deal with the potential of the new technologies, particularly in terms of curricular innovation and change of practices of teaching and learning.

While examining the success factors of digital portfolio usage, Barrett and Wilkerson (2004) refer to recommendations by Teitel, Ricci and Coogan (1998) in the context of experienced teachers constructing teaching portfolios in Professional Development Schools:

- “Portfolios are key tools for teacher development and they should be designed **to promote reflective practice**. [emphasis added]
- Portfolios should be shared with colleagues, because colleagues are an important source of creative input and because such sharing promotes collaboration.
- Portfolios should be encouraged for cooperating teachers as well as for student teachers. Portfolios present a model of teachers as learners and as professionals who “make sense” of their work.
- Portfolio development should be a “bottom-up,” voluntary process that is owned by teachers and not used for evaluation purposes. **The best way to kill it would be to make it mandatory or to use it for evaluation. Key benefits are lost if the reflective culture of professional development is replaced by a “culture of compliance” – where teachers go through the motions of assembling materials according to a predated checklist.** [emphasis added by Barrett & Wilkerson)]

- Portfolio development for experienced teachers should be supported by enabling conditions: for example, time, money for materials, some structure or facilitation for the development process. Modest extrinsic motivations, such as credit, may be used to encourage teachers as long as they do not take over and transform the activity into a compliance experience.” (Barrett & Wilkerson, 2004).

Functions and benefits of digital portfolios in teachers’ professional development

Some authors have shown that the teacher’s use of the portfolio is meant to:

- Support awareness-raising of pedagogical beliefs and assumptions underlying their practice;
- Consolidate knowledge regarding the profession and its political and institutional conditionings;
- Promote articulation between theory and practice;
- Reinforce acknowledgement of the student role in learning;
- Contribute significantly to the development of competences linked to reflectivity, the collection and selection of information as well as its communication;
- Develop self-assessment mechanisms and facilitate collaborative practices and the exchange of experiences.

(Anderson and DeMeulle, 1998; Barrett, 2000; Darling Hammond and Snyder, 2000; Harland, 2005; Kplan, 1998; Zidon, 1996.)

Key elements of teacher training for digital portfolios

One of the primary aims of the DigiFOLIO project is to identify the competences needed by teachers for developing and using digital portfolios. In this chapter, the focus has been on the use of portfolios for teacher professional development. As a conclusion, we should be able to outline the necessary factors required for successful implementation of digital portfolios. If our task is to support teachers in adopting digital portfolios as a strategic tool for their own learning and growth, we must be aware of the conditions of successful implementation and of the needs of training related to teachers' competences, specifically:

1. What *attitudes* must be developed (and how) to open teachers' minds for using digital portfolios as a personal strategy of professional development?
2. What *knowledge* must they acquire (and about what?) for being competent in using digital portfolios as a self-reflection and self-regulation strategy?
3. What basic *skills and competences* must they acquire in order to start using the digital portfolio strategy in their practices?

Awareness

The culture and context of an educational institution is a critical component in determining the possibilities and constraints for the design and implementation of digital portfolios. The support of the community is crucial for the effective progress of the portfolio development process. Kankaanranta's (2002) study proved that "important characteristics of internal support include a general approval and valuation of reflective practices as an inherent part of the school culture, a whole-school approach emphasizing collaboration in assessment practices, and more practical issues of ensuring sufficient access to computers and ICT training for teachers" (p.220). Furthermore, she proceeds to elaborate the crucial features of a *portfolio culture* which include at least valuation of reflective practices, active collaboration between diverse actors within and outside the educational community, and interest in the work of others. Developing a portfolio

culture presumes that the portfolio approach is considered and valued as an essential part of pedagogical practices. (p. 221).

Access

The second key element of teacher training on the use of digital portfolios for professional development is *access*. In this context, we are considering access to different kinds of tools that a teacher needs for developing the use of digital portfolios. There are a large variety of different tools, including not only technological devices and applications but also conceptual tools like models of portfolio-assisted professional development, and experiences and good practices. Basically, there needs to be access to information, knowledge and technology.

Implementation

Sjunnesson (2002, 32) perceives that “high hopes are set for digital portfolios as a solution to provide teacher students with enough competence to meet the expectations in ICT competency that they need.” In practice many teachers are reluctant, because they experience lack of adequate skills for using computers in classrooms or feel ICT as a treat. In addition to knowledge, certain ICT skills are necessary for constructing digital web portfolios (c.f. Kankaanranta 2002, 118).

According to Kilbane (2003), the term “skill” implies that teachers know and can use various technology applications proficiently whereas the term “knowledge” implies that teachers understand the potential that various applications have for helping them in their work. However, like Kilbane argues, knowledge and skills are really only useful if the teacher can integrate them to make learning more efficient, effective and engaging.

Creating a digital portfolio is a valuable educational experience for teachers in many ways. It is not only a process to acquire skills but actually a self-development process that allows them to rediscover the experiences of a learner. Through this process they become more aware of the learning process, understand the challenges and frustrations of being a learner better and become more sympathetic to their students. (Kilbane 2003, 113-114,118).

Reflection and development of practices

Acquiring knowledge, skills and experiences forms the foundation of teacher professional development in the use of digital portfolios. However, the key issue in integrating knowledge and skills and learning from experiences is *reflection*. In teacher education it is essential to empower teachers “to reflect critically on their own strengths and weaknesses for the purpose of charting directions for their professional growth” (Kilbane 2003, 112). Reflection is also a crucial component of a teaching portfolio, because it is the reflections that give meaning to the materials in the portfolio (Kilbane 2003, 113).

Kankaanranta (2002) found in her action research project that it is impossible to distinguish reflection from the other phases of portfolio work, namely documentation and selection. Instead of being separate and sequential, these phases are always intertwined and linked together, as contents is continuously revised and updated. Likewise, design and implementation are closely intertwined in the portfolio development process (p.155).

The prominent paradigm and theories of learning highlight the social dimension of learning. Learning is considered a process taking place in social contexts and to a considerable extent in social interaction. This implies that the social dimension is particularly important also in the development of digital portfolios for professional learning (c.f. EIFEL, 24).

In Kankaanranta’s study *collaborative reflection* emerged as an essential part in all cycles of portfolio development, and collaborative reflective practice was perceived inherently present in portfolio development from the outset, since portfolio work introduced to teachers as collaborative activity. Collaborative reflection and individual thinking can be made visible through a portfolio. In addition to providing a means for communication a portfolio can give rise and stimulate reflection. (Kankaanranta 2002, 229-230). When a portfolio is shared with others, professional development through peer support and peer review is enabled. These are particularly important, since previous studies have shown that diverse methods are required to scaffold teachers in reflecting on their

experiences and making connections to pedagogical practices (see Kankaanranta 2002, 221).

References

- Attwell, G. (2005). *Recognising learning: educational and pedagogic issues in e-Portfolios*. Conference Papers of ePortfolio 2005, Cambridge. Retrieved on March, 10, 2006 from: <http://elgg.net/gattwell/files/486/1465/eportfoliopaper.doc>.
- Barrett, H.C. & Wilkerson, J. (2004). *Conflicting Paradigms in Electronic Portfolio Approaches*. Retrieved on April 13, 2006 from <http://www.electronicportfolios.com/systems/paradigms.html>.
- Bransford, J., Brown, A., & Cocking, R. (Eds.). (1999). *How people learn: Brain, mind, experience, and school*. Washington, DC: The National Academies Press.
- CEP (2004). *Common European Principles for Teacher Competences and Qualifications*. European Commission. Directorate-General for Education and Culture. Available at: http://europa.eu.int/comm/education/policies/2010/doc/principles_en.pdf.
- Cognition and Technology Group at Vanderbilt. (1990). *Anchored instruction and its relationship to situated cognition*. *Educational Researcher*, 19(6), 2-10.
- Education and Training 2010: http://europa.eu.int/comm/education/policies/2010/doc/compendium05_en.pdf
- EIFEL. *ePortfolio Planning for Adult Learning Centres*.
- Fullan, M. (1996-2006) www.michaelfullan.ca.
- Kankaanranta, M. (2002). *Developing digital portfolios for childhood education*. University of Jyväskylä, Institute for Educational Research. Research Reports 11.
- KCKBS (2005). *Key Competences in the Knowledge-Based Society*. European Commission. Directorate-General for Education and Culture.
- Kilbane, C.R. (2003). *Digital Teaching Portfolios: A Tool for Educating and Evaluating Teachers*. Accessed on April, 21, 2006 at: http://www.nesinc.com/PDFs/2003_13Kilbane.pdf.

- Lohman, M. (2000) *Environmental Inhibitors to Informal learning in the workplace: A Case study of Public School Teachers*. *Adult Education Quarterly* 2/2000.
- McCoy, A. & Barrett, H. (2004). *Researching the Process and Outcomes of Electronic Portfolio Development in a Teacher Education Program*. Paper presented at the American Educational Research Association meeting, San Diego.
- Newby, T. (1996). *Instructional technology for teaching and learning: Designing instruction, integrating computers, and using media*. Englewood Cliffs, N.J.: Merrill.
- OCDE. (2005). *Education at a glance*. OECD indicators 2005.
- Paiva, J. (2002). *As tecnologias de informação e comunicação: Utilização pelos professores*: Ministério da Educação - DAPP.
- Papert, S. (1997). *A família em rede* (edição portuguesa ed.). Lisboa: Relógio d'Água.
- Plomp, T., & Pelgrum, W. (1991). *Introduction of computers in education: State of art in eight countries*. *Computers & Education*, 19, 249-258.
- Ravet, S. (2005). *ePortfolios for a learning society*. Paper presented at the eLearning conference in Brussels, 19-20 May 2005. Retrieved on April 21, 2006 from: http://www.elearningconference.org/key_speaker/ravet.htm.
- Risko, V. (1991). *Video.Disc case methodology: A design for enhancing preservice teachers problem-solving abilities*. *American Reading Forum*, 11, 121-137.
- Schön, D. (1983). *The reflective practitioner: How professionals think in action*. New York: Basic Books.
- Schön, D. (1987). *Educating the reflective practitioner*. San Francisco: Jossey-Bass.
- Schön, D. (Ed.). (1991). *The reflective turn: Case studies in and on educational practice*. New York: Teachers College Press.
- Simmons, C., & Wild, P. (1991). *Student teachers learning to learn through information technology*. *Educational Research*, 33, 163-173.
- Sjunnesson, J. (2001). *Digital learning portfolios: inventory and proposal for Swedish teacher education*. Available at:

<http://www.skeptron.ilu.uu.se/broadly/dl/p-sjunnesson-digitallearningportfolios-0201.pdf>.

Willis, J., & Mehlinger, H. (1996). Information technology and teacher education. In J. Sikula (Ed.), *Handbook of research on teacher education* (pp. 978-1029). NY: Mc.Millan.

CHAPTER 5
ICT POTENTIAL
ANALYSIS OF THE NATIONAL
REPORTS

ICT POTENTIAL

ANALYSIS OF THE NATIONAL REPORTS

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Introduction

This reflection was made upon and intended to reflect the content of the National Reports produced by the partner institutions under the scope of ICT use in the observed educational systems. The guidelines for this analysis were built from three main questions: which ICT potentials are there to support teaching and learning strategies? Which ICT potentials are there to support learning assessment? And finally, which ICT potentials are there to support teachers' professional development?

Which ICT potentials are there to support the teaching and learning strategies?

The designation of ICT stands for Information and Communication Technologies which replaced the previous IT. This current change in the designation stresses the importance of the communication dimension and broadens the sense of its usage, namely in the educational field. This is the approach that will be looked at in this report.

Currently, there is a strong focus on the development of ICT policy and of integration of ICT in curriculum and practice across the entire education sector. ICT and "e-learning" have become important concepts in primary, secondary, and tertiary education in most areas of the world, Europe being no exception to this. Across Europe and in particular in the countries that are part of this specific project, political measures taken in the last years reflect this fact.

But the simple growth of technical infrastructures to implement ICT in schools is not by any means a guaranteed improvement of learning and teaching strategies. Many researchers have pointed out the serious lack of pedagogical purpose that still fails to accompany the growing introduction of technology into schools. The result will be that of little improvement in teaching practices and, consequently, hardly any changes in real benefits for students. Higgins (2003), for example, clearly stressed that the real difference lies in the way in which equipment and other resources are used, rather than in the technology by itself.

The development of new multimedia technologies and the growth of the Internet in recent years have given Europeans access to an incredible range of information and resources. Successfully exploiting this potential for improving education and training depends far more on pedagogical and organizational issues than on the technologies themselves.

The introduction of information and communication technology (ICT) has to be accompanied by a far-reaching reorganization of learning structures. In addition, it is vital that technological innovation is developed to serve education in highly diverse learning contexts, while respecting linguistic, cultural and social differences.

(in http://europa.eu.int/information_society/edutra/inno/index_en.htm)

Teacher training programmes in European countries are struggling to adjust quickly and give meaningful input to the pedagogical use of ICT in learning environments. These can vary from initial levels of teacher performance as an ICT user

himself/herself to the most intricate aspects of ICT Coordination within the school organization. A good example of this is seen in the Finish case where “(...) *ten percent of the Finnish primary and secondary school teachers were expected to gain special skills, containing abilities to utilize some advanced computer-based applications in more depth, to create digital learning material, to provide collegial guidance, and act as a trainer and a developer of collaboration between institution*”. (In *Finish National Report, cited by the text of the Comparative Synthesis*).

Regardless of the measures and correspondent deadlines that are being carried out to promote the skillfulness of teachers in ICT there is still much ground to be covered in order to see actual and meaningful changes in practice within European Education. This is mainly due to the fact that the process of change in terms of attitude and sense of ownership towards ICT is slow.

Accordingly, it is our belief that in education the following potentials of ICT should be looked for:

- An effective support system where both learning and teaching communities profit from ease in exchanging meaningful information between its members;
- The strengthening of school-community relationships;
- The facilitation of the flow of communication between school communities and other learning environments, such as experts. Also, a more effective display of learners’ achievements to the other social partners involved (e.g. parents);
- Promoting effective ICT literacy in the process of life long learning.

“...a new form of literacy, but it is one that is increasingly considered to represent an essential curriculum entitlement in

any broad and balanced curriculum for the twenty-first century” (Siraj-Blatchford & Whitebread, 2003, p. 1).

From a more general perspective, we can firmly state that ICT is already helping students to learn outside traditional learning environments (basically in any place and at any time they choose). This therefore contributes towards reaching learners who were previously, for various reasons, excluded.

In many official documents we find that the broadening of the use of new technologies is an EU priority, taking place through specific national and trans-national measures and programmes. This responds to the daily life of citizens, whether on the private or professional level. It also strengthens the important opportunities of life-long learning. The measures and programmes aim to support collaborative learning, facilitate sharing and transfer of knowledge and to extend access to new learning opportunities independent of time and place. However, when we look closely into national realities within the European context and among the partner countries of the DigiFOLIO project we still find many different execution rhythms in which these measures are being put into practice. Even if in some countries national legislation seems to be going in the right direction towards expected results, in reality practice is still far removed from desirable results.

Which ICT potentials are there to support the ‘Learning assessment’?

Within the school-sector ICT literature, there has been a strong focus on measuring the effects of linking the use of ICT in terms of assessments of student learning or achievement (Lewin, Scrimshaw, Harrison, Somekh, & McFarlane, 2000; Schacter, 1999).

Here, as before, we look into technology as a tool, a means to help achieve the aimed for output. And the first real challenge is in setting ICT into its proper place, i.e., it is not to be given the first role in learning assessment but is instead a powerful help to it.

It is in this regard that we believe that Digital Portfolios are an added value to the learners since they provide them with a resource to get highly involved in their own learning process

and assessment, thus giving them full understanding of what they are expected to achieve. In this sense one can say that Digital Portfolios are meant to keep track of students' successes rather than their failures.

Such a process involves sharing learning goals, providing constant feedback that enables students to recognise what next steps they should take, as well as how to take them. It also enables both teachers and students to review and reflect on the assessment data information by observing not only the products but also and mainly the processes of learning.

Portfolios also make sense of the students' work and help give that work a public dimension that would be lost or more difficult to achieve when using other working platforms.

Again we come across different development stages of the implementation of Digital Portfolios in education in Europe. Whereas in Finland, The Netherlands and Belgium the use of portfolios (even in the traditional format) has been a common practice for over a decade, in other countries (namely Portugal, and the CZ Republic) the first steps are still being taken. This means that countries that were already quite accustomed to integrating portfolios in the learning process are more rapidly integrating Digital Portfolios and recognising their potential in the educational field. This is not about a mere storage of data but more about the richness of potential that digital format allows, i.e., the constant communication and feedback between teachers and students.

Much is expected from portfolio assessment, but teachers still need to spend time and effort in developing and implementing portfolios' assessment strategies. It's not enough only to recognise that their use brings advantages for teaching and learning through increasing skills, level of achievement and motivation.

Which ICT potentials are there to support the 'Teachers' professional development'?

Teachers' professional development in relation to ICT will not be effective unless good guidance, examples, and support for their own professional learning is clearly set. Otherwise teachers will go on making their own decisions about the nature

and extent of ICT use in students' learning, regardless of national or trans-national principles. These decisions are influenced by such factors as their own level of confidence with ICT and their convictions about learning and teaching. Again the added value of the use of ICT in education must be clearly demonstrated to the professionals involved. Without this the expected shift in the teacher's role will not take place.

Once more the situation is very varied in many European countries, as teachers themselves are still in different stages of their own development as far as ICT users, let alone as mentors or agents of change. Some countries have specified these stages of ICT literacy in terms of desirable goals to be achieved before a specific deadline. Here teachers training programmes mirror the political effort made. However, training teachers in ICT and with ICT is not enough. Evidence must be shown as to the pedagogical advantages of ICT usage in education with the students. This is a more difficult goal to reach, even for those countries where schools are already properly equipped and infrastructure is not regarded as an obstacle.

Effective ICT professional development incorporates teachers' own aspirations, skills, knowledge, and understanding into the learning context but also requires a more definite and more effective role of the school leadership. There is increasing proof that sometimes school leadership undermines instead of encourages structure. The notorious lack of personal experience and even unskilled ICT school leaders has demonstrated to be a serious obstacle to a desirable natural growth of ICT pedagogical usage in all educational levels.

Teachers' professional development in relation to ICT requires an emphasis on the building of collaborative knowledge. It demands of practitioners that they share their situated ICT learning experiences with one another. When these aspects are taken into account they provide support networks to help teachers to become active researchers in their own education setting and to access current research and expertise in ICT. In this way, true professional development can be constantly reflexive and updated.

Conclusions

The European Commission has set out common European principles for teacher competences and qualifications in 2005. One of the eight key competences set for teachers is **ICT skills**. According to a simple sociological analysis this competence can be seen as inevitable if we take into account the social changes which have taken place in the last years and are continuously increasing. Consequently, it is rather incomprehensible that education could afford not to keep pace with the rhythm of the social changes that are already affecting students all over the world. It would be rather absurd even to consider having educational systems set upon principles and practices that are not real, accepted and effective any longer. This being said, the question that every agent in education should immediately ask is: to what extent is the previous statement being denied or corroborated nowadays? Do we, or do we not, advocate for a modern, updated and truly effective educational model? These questions demand honest, urgent and, most of all, effective answers from all those who carry any degree of responsibility in education: policy makers, decision takers, school leaders, community leaders, parents and surely teachers. A paradigm shift in teaching is needed and expected. It is already risking coming too late. This includes **Information and Communication Technologies**.

References

Camp, R. (1992). Portfolio reflections in middle and secondary school classrooms. In K.B. Yancey (Ed.), *Portfolios in the writing classroom* (pp. 61-79). Urbana, Illinois: National Council of Teachers of English.

Cole, D., Ryan, C. & Kick, F. (1995). *Portfolios across the curriculum and beyond*, Corwin Press, Thousand Oaks, Ca.

Farr, R. & Tone, B.(1994). *Portfolio and performance assessment: Helping students evaluate their progress as readers and writers*, Harcourt Brace College Publishers, Fort Worth, TX.

Foote, C.J. & Vermette, P.J. (2001). *Teaching portfolio 101: Implementing the teaching portfolio in introductory courses*. *Journal of Instructional Psychology*, 28(1), 31–37.

Funderstanding (1998). *About learning / theories. How do people learn?* Constructivism.

Available on-line:

www.funderstanding.com/learnin_theory_how1.html

Hackney, C. (1999). *Three models for portfolio evaluation of principals*. *Schools administrators* 56 (3), 36.

Kearsley, G. (1994, 1999). *Explorations in learning & instruction: The theory into practice database*. Washington, DC: George Washington University.

Retrieved from <http://www.gwu.edu/~tip/>

Lankes, A. (1995). *Electronic portfolios: A new idea in assessment*. ERIC digest EDO-IR-95-9. Available online: <http://ericir.syr.edu/ithome/digest/portfolios>.

Niguida, D. (1993). *The digital portfolio: A richer picture of student performance*, Eric document reproduction service no, ed. 400 261.

Smith, K. & Tillema, H. (1998). *Evaluating portfolio use as a learning tool for professionals*, *Scandinavian journal of educational research*, 42, 2, 193-205.

Wade, R.C., & Yarbrough, D.B. (1996). Portfolios: A tool for reflective thinking in teacher education. *Teaching and Teacher Education: An International Journal of Research and Studies*, 12 (1), 63–79.

CHAPTER 6

**TECHNOLOGIES MAY HELP
THINKING...**

TECHONOLOGIES 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
<i>To promote the reflexive thinking</i> <i>To evidence the self-reflection process</i>	Reflection
<i>To structure the procedures of teaching and learning</i> <i>To collect information in a structured and personalised way</i>	Structure

<p><i>To stimulate communication among al the intervenient in the educational process</i></p> <p><i>To develop interactive and collaborative processes</i></p>	Communication
<p><i>To promote student's autonomy in the learning management</i></p> <p><i>To commit students in the learning process</i></p>	Motivation
<p><i>To facilitate the student's participation in the contents selection and in the evaluation criteria</i></p> <p><i>To negotiate the choice of the content to be included according to the established criteria between teacher and student</i></p>	Decision
<p><i>To register the procedures and document the learning process</i></p> <p><i>To exhibit the works that can evidence the acquisitions</i></p>	Visualisation
<p><i>To involve actively all the participants in the learning process and in their evaluation</i></p> <p><i>To provide new teaching ways and participated and productive learning environments</i></p>	Participation
<p><i>To show evidence of the effort and progress in the knowledge and competences acquisition process</i></p> <p><i>To enhance the process of personal integration of knowledge the acquired during the theoretical and practical training.</i></p>	Evolution

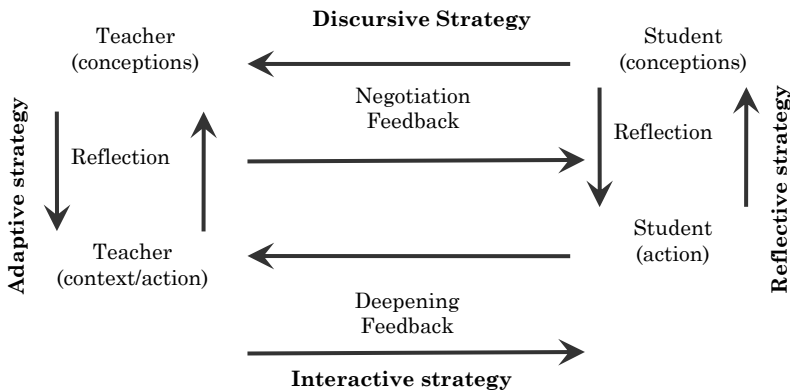
2.2. Analysis Categories

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

<p>DISCURSE STRATEGY (Communication, Participation)</p>	<p><i>To keep a continuous communication relationship among several intervenient;</i></p> <p><i>To negotiate contents and objectives (teacher and students);</i></p> <p><i>To express ideas related to the negotiated objectives;</i></p> <p><i>To participate actively in the knowledge building process.</i></p>
<p>ADAPTATIVE STRATEGY (Evolution, Selection)</p>	<p><i>To build learning activities fitting the conceptions of the different intervenient;</i></p> <p><i>To adapt the learning objectives to the students' interest and bearing in mind the interactions (dialogue);</i></p> <p><i>To recognise the advantages and difficulties in the portfolios building process;</i></p> <p><i>To allow a personal and social commitment in the teaching and learning process.</i></p>
<p>INTERACTIVE STRATEGY (Motivation, Visualisation)</p>	<p><i>To give student feedback, helping him to achieve the learning objectives;</i></p> <p><i>To recognise the meaning of the teacher's feedback in a way that he can gather the content which fit best his profile;</i></p> <p><i>To add other information aiming at complementing a given content/topic;</i></p> <p><i>To represent ideas/contents using different ways of expression (text, images, sound, video...).</i></p>
<p>REFLEXIVE STRATEGY (Reflection, Structure)</p>	<p><i>To reflect upon and write about the teaching and learning process;</i></p> <p><i>To structure and record students' ideas, perceptions and convictions;</i></p> <p><i>To reflect on the student's descriptions;</i></p> <p><i>To give different ways of knowledge organisation allowing the knowledge deepening.</i></p>

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”.

References

Almeida, J.(2003). *Implementação de Portfolios no 10º ano de escolaridade: Contributos para o processo de aprendizagem e avaliação em Matemática*. Dissertação de Mestrado em Matemática/Educação. Porto: Universidade Portucalense.

Bernardes, C. & Miranda, F.(2003). *Portfólio. Uma Escola de Competências*. Porto: Porto Editora.

Birney, R., Barry, M., Héigeartaigh, M. (2006). *Blogs. Enhancing the Learning Experiences for Technology Students*. Paper presented at the International Conference on ED-MEDIA.

Cardoso, A.; Peixoto, A.; Serrano, M.C. e Moreira, P. (1996). O Movimento da autonomia do aluno. Repercussões a nível da supervisão. In Alarcão, I. (organização). *Formação Reflexiva de Professores. Estratégias de Supervisão*. Porto: Porto Editora.

Galvão, V. (2005). A utilização de “portfolio” reflexivo na disciplina de Biofísica de um Curso de Fonoaudiologia. In Sá-Chaves, I. (organizadora). Os “portfolios” reflexivos (também) trazem gente dentro. Reflexões do seu uso na humanização dos processos educativos. Porto: Porto Editora.

Laurillard, D. (1993). *Rethinking university teaching. A framework for the effective use of educational technology*. London: Routledge.

Nunes, J. (2000). *O professor e a acção reflexiva. Portfolios, “Vês” heurísticos e mapas de conceitos como estratégias de desenvolvimento profissional*. Porto: ASA Editores.

Sá-Chaves, I. (2000). *Portfolios Reflexivos. Estratégia de Formação e de Supervisão*. Aveiro: Universidade de Aveiro.

Sá-Chaves, I. (1997). Novas abordagens metodológicas: os “portfolios” no processo de desenvolvimento profissional e pessoal dos professores. In Estrela, A. e Ferreira, J. (org.). *VII Colóquio Nacional da AIPELF/AFIRSE*.

Serafim, M. (2000). *Portfolio vocacional. Estudo exploratório sobre a aplicação do portfolio de competências em aconselhamento de carreiras*. Dissertação de Mestrado em Ciências de Educação, Formação Pessoal e Social. Universidade Católica Portuguesa, Faculdade de Ciências Humanas.

ANNEXE
ANALYSIS AND EVALUATION GRID

Analysis and Evaluation Grid

(TECHNOLOGIES FOR PORTFOLIOS BUILDING)

TECHNOLOGY IDENTIFICATION	
NAME	<i>WEBLOG (in short: Blog)</i>
DESCRIPTION	<p>The <i>weblog</i> is in general terms a Web page with its contents <i>disposed</i> in chronological order (from the most recent to the most recent to the oldest).</p> <p>There is nowadays a huge diversity of blogs, in respect to the format and content as well. <i>Blogs</i> may be created and updated by a single person (personal <i>blogs</i>) or by a group with similar interests (collective <i>blogs</i>).</p> <p>In educational context it is a useful tool intended for the building of activities They enable dialogue and reciprocity (collaborative learning).</p> <p>Most <i>weblogs</i> have two complementary tools (1) the comments tool; (2) <i>trackback tool</i>. The first one allows the reader to add comments to the contents already posted by the author. The second allows the posts to be mentioned in other blogs.</p>
VERSION	<p>Exemples of services that allow “blog building”:</p> <p>Blogger, http://www.blogger.com/start Blogs no Sapo, http://blogs.sapo.pt/ Weblog.com.pt, http://weblog.com.pt/ MSN Spaces, http://spaces.msn.com/ TypePad, http://www.typepad.com/ Wordpress, http://wordpress.com/ Weblogger, http://weblogger.terra.com.br</p> <p>BigBlogTool, http://www.bigblogtool.com/</p>

	Blogalia: http://www.blogalia.com/ TheBlog, http://www.theblog.com.br/
LANGUAGE	Available in several languages.
ACESSIBILITY	Most “blog building” platforms are free of charge.
REQUISITS	Usually only internet access and a web mail address are enough to create a blog.
OBSERVATIONS	
PEDAGOGICAL POTENTIAL	
DISCURSIVE STRATEGY (COMMUNICATION, PARTICIPATION)	<p>A <i>Weblog</i> allows constant communication among several participants. This communication does not necessarily refer to a group/class; on the contrary, it allows other people to take part in the discussion and knowledge building.</p> <p>Depending upon the negotiated objectives the student can express his ideas about the learning process, interact with others e go deeper into the aspects he considers more significant.</p>
ADAPTATIVE STRATEGY (EVOLUTION, SELECTION)	<p>A systematic register of the student’s learning, difficulties and personal reflections allows the teacher to better understand the learning process as well as to operate as a facilitator.</p> <p>The student’s self - reflection will make him understand better the feedback and the teacher’s support.</p>
INTERACTIVE STRATEGY (MOTIVATION, VISUALISATION)	<p>A <i>Weblog</i> allows students to interact around the study subjects by sharing their opinions and getting instant feedback. This also increases motivation and can be achieved by:</p>

	<p>Guidance and information; Accuracy of a content; Information complement; Reinforcement and stimulus; Advisement towards alternative path;</p> <p>By interacting with others the student recognises the usefulness of the feedback and strengthens his learning ability. He also looks for other complementary information on the learning subject.</p> <p>This technology allows the ideas to be represented in several formats (text, pictures, sound and video) and connect to the outside through links.</p>
<p>REFLEXIVE STRATEGY (REFLECTION, STRUCTURE)</p>	<p><i>Weblogs</i> can be used by the student to record his own reflection on the learning process and results in a certain moment: what he is learning, how he is learning, the achieved and expected acquisitions, the difficulties he encountered, the overcome barriers, the needed resources, etc</p> <p>Through this the teacher can also reflect upon the process and upon his particular action and therefore improve different strategies and resources thus becoming a true reflective teacher.</p>
GLOBAL SYNTHESIS	
<p>LEARNING AND USING EASYNES</p>	<p>This technology is very simple and it doesn't take long to acquire. The user doesn't need any specific knowledge of HTML in order to publish his material. In some cases there is technical support. There are also several samples for content presentation.</p> <p>The <i>interface</i> is quite intuitive and easy to follow with the following main functions:</p>

	<p>edit, format and publish text/image identify the author; add and delete comments; create <i>links to other pages</i>; archive <i>posts</i> chronologically.</p> <p>Other facilitating features of this technology are related to lower production costs since the service is free of charge in most of the situations with the advantage of quick editing and information updating and access to wide audiences.</p>
STRONG POINTS	<p><i>Weblogs</i> are appropriate to digital portfolio building.</p> <p>Interaction and outer visualisation provide a greater degree of motivation in comparison to traditional portfolios.</p> <p>Flexibility is also a strong point to be considered when presenting contents. Again, communication among educational actors (and others) is highly facilitated by this tool.</p>
WEAK POINTS	<p><i>Internet Access</i> is indispensable to the process.</p>
GOOD PRACTICE EXAMPLES	
OBSERVATIONS	

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CONCLUSIONS

CONCLUSIONS

Digital portfolios, also referred as e-portfolios and web-folios, are becoming recognised as a valuable tool for learners and teachers. They can also be viewed as a response to fundamental shifts in learning, teaching, technology, and learner needs in a world where learning is no longer confined to formal education.

Digital Portfolio usage must be viewed as a continuum. Portfolios can perform several tasks: assessment, professional / personal development, learning portfolio, or group portfolio.

Regardless of their format, they should encourage learners to develop the skills to continue building their own personal portfolio as a life-long learning tool. Portfolio implementations must be regarded as an on-going process.

Today the portfolio is included in the education process of all the countries participating in the DigiFOLIO project, even though it is given different levels of importance and usage.

There is a significant set of common points among the five countries. Their educational systems follow largely the constructivist approach. This shift from teaching to learning, as the focus of professional development, fosters new ways of acting and reflecting. The portfolio becomes an important and purposeful tool to sustain reflection, and to document the collection of individual work evidencing the whole process. At the same time portfolios are regarded as a meaningful and alternative evaluation form.

Currently, there is high receptivity towards digital Portfolios in education. According to Helen Barret, their main advantages are related to some of the following aspects: high storage capacity, portability, constant updating possibility, learner centred, reveals and improves technology skills and displays easily accessed information.

Despite all the recognised strong points, it has been difficult to implement digital portfolios in the working environment of students and teachers. Some of the setbacks are primarily related to lack of teachers' competence in ICT skills.

Valuing the importance of this special area, the European Commission has set out common European principles for teacher competences and qualifications in 2005, among which ICT appears as a significant one. In this regard education can not be seen as an isolated branch in the society where ICT have become essential in almost daily activities. On the contrary, it should reflect and take in the social advancements.

On the other hand, the importance of digital portfolios in relation to assessment is not yet clearly owned by teachers and students. Although continuous reflection should help the learner on how and where he can improve, this is clearly a highly consuming process as far as time and energy are concerned. It must imply a continuous flow of information between teacher and student and also a systematic redefining of goals and strategies. Here the teacher is more of a provider of guidance and support than a mere conveyor of knowledge and the student has to participate actively also in the assessment part of the learning process. His previous knowledge and background becomes a meaningful part of the learning context and must be taken into account. This is what some authors mean when they refer to portfolios as a way of telling someone's story.

Portfolio means long term evaluation rather than short term testing and at the same time promotes individualization. Portfolio assessment is more than reproduction of materials – it is mainly production. In the case of digital portfolios, the process is empowered by a multimedia environment.

Adequate and appropriate preparation of teachers in fields such as “Curricular Development” and particularly “Assessment” are fundamental so that the strategy of *portfolio* use may be the result of each teacher's conscious decision, based on the benefits that may ensure a final optimal result on a self-assessment basis of his/her pedagogical conceptions and effective practices.

In other words, it should be the result of each teacher's “teaching model”. It requires preparation with emphasis on awareness of the implications of *portfolio* use as a professional development strategy, namely in terms of attitude changes regarding assessment and also in terms of necessary competences for its implementation.

GLOSSARY

GLOSSARY

This glossary of educational terms and ideas has been compiled by the partners of the Project during the first year research work. It consists of a brief compilation of some terms currently used in education and more specifically in relation to the use of portfolios and teachers' professional development. The main goal of this section is to illustrate the diversity of concepts one can find in the work of the subject researchers. Wherever possible, references have been provided and links for further resources have been supplied.

A

Ability: Competence in doing; natural aptitude or acquired proficiency. In *Webster Collegiate Dictionary, 10th ed.*

Active processing: "Active processing" allows students to review how and what they learned so that they begin to take charge of learning and the development of personal meanings. Active processing refers to reflection and metacognitive activities.

<http://www.pgcps.pg.k12.md.us>

Artifact: An artifact is any file, completed form, or link to an external website that a portfolio owner stores for use within the ePortfolio environment. Artifacts may be assignments, documents, videos, or any other materials that help demonstrate your learning achievement. You can store artifacts in your ePortfolio Repository. In *Indiana University Information Technology Services Glossary*.

<http://kb.iu.edu/data/aqhz.html>

Assessment: An exercise, such, as a written test, portfolio, or experiment, that seeks to measure a student's skills or knowledge in a subject area (*Educ. Week on Web*).

Assessment: Evaluating a learner's ability to use knowledge and skills to create a product or complete an assessable task.

<http://eportfolio.cascadia.ctc.edu/students/help/glossary.asp>

C

Competency: Specific skill or knowledge related to the performance of a task, usually related to a job-related task (*CLDT*).

Constructivist Perspective: Educators who seek to guide children and youth toward discovery and knowledge should themselves be learners. Learners actively construct knowledge on the basis of personal experiences. Teaching is learning and learning is teaching. Learning is both acquisition and construction. As a facilitator, a constructivist teacher motivates students to actively seek knowledge, and through affective communication encourages and guides their growth and creativity. Gaining knowledge, skills, and dispositions to help every student learn in diverse classroom settings is central to the constructivist perspective.

<http://www.uwlax.edu/soe/html/conceptual%20framework.htm>

D

DigiFolio: “*Digital Portfolio as a strategy for teachers’ professional development*” a Comenius 2.1 project. The main objective of the digiFolio project is to use the educational possibilities of portfolios supported by ICT in teacher's professional development leading to the building up of new competences and new approaches in

the learning methodologies. Accordingly, a shift in the role of the teacher will arise since the focus will be on student centered rather than teacher centered learning environments with the subsequent increase of students' responsibilities and motivation in their own educational path.

<http://www.digifolio.org>

Digital: The word digital is most commonly used in computing and electronics, especially where real-world information is converted to binary numeric form as in digital audio and digital photography. Such data-carrying signals carry either one of two electronic or optical pulses, logic 1 (pulse present) or 0 (pulse absent). The term is often meant by the prefix "e-", as in e-mail and ebook, even though not all electronics systems are digital. In *Wikipedia*.

Digital content: Digital content enables students to seek and manipulate digital information in collaborative, creative and engaging ways that make digital learning possible. In a digital learning environment, just as in a traditional learning environment, content is anything used to teach or learn. It includes textbooks, films and worksheets but can also be a blueberry pie cut into pieces to illustrate fractions or baking soda and vinegar to explain the properties of a gas. Digital content is not only computer-based. It includes video on demand, software, CD-ROMs, web sites, e-mail, on-line learning management systems, computer simulations, streamed discussions, data files, databases and audio. When applied appropriately by teachers and students in a productive, project-centered learning environment, digital content makes a vast reservoir of information, ideas, resources and experts accessible at any time. The strength of digital content in education stems from its dynamic characteristics that allow students to both locate and construct information.

<http://www.ceoforum.org/downloads/report3.pdf>

Digital learning: Digital learning is the educational approach that integrates technology, connectivity, content and people. When implemented correctly, digital learning builds on the unique, dynamic characteristics of digital content to foster productive and engaging learning. This in turn both supports and promotes the essential skills students will need in education, life and work in tomorrow's world.

<http://www.ceoforum.org/downloads/report3.pdf>

E

Electronic Portfolio: An electronic portfolio uses electronic technologies, allowing the portfolio developer to collect and organize portfolio artifacts in many media types (audio, video, graphics, and text). A standards-based portfolio uses a database or hypertext links to clearly show the relationship between the standards or goals, artifacts and reflections. The learner's reflections are the rationale that specific artifacts are evidence of achieving the stated standards or goals. Often, the terms Electronic Portfolio and Digital Portfolio are used interchangeably; however there is a distinction: an Electronic Portfolio contains artifacts that may be in analog form, such as a video tape, or may be in computer-readable form; in a Digital Portfolio, all artifacts have been transformed into computer-readable form. An electronic portfolio is not a haphazard collection of artifacts (i.e., a digital scrapbook or a multimedia presentation) but rather a reflective tool that demonstrates growth over time (*Barrett, 2000*).

ePortfolio: In the context of education and learning an ePortfolio is a portfolio based on electronic media and services. It consists of a personal digital record containing information such as personal profile and collection of achievements, information on which different services can be provided to the owner of the

ePortfolio and the people and organisations to whom the owner has granted access. What gives ePortfolios the edge over traditional portfolios is the considerable increase in the number and quality of services that can be provided to individuals and the community. In order to make these services widely accessible, ePortfolios must comply with interoperability standards.

<http://www.centipedia.com/articles/EPortfolio>

Expectation: An expectation is an objective to be met that a reviewer of a matrix defines. In *Indiana University Information Technology Services Glossary*.

<http://kb.iu.edu/data/aqhz.html>

H

Holistic learning: The integration of intellectual, social and emotional aspects of undergraduate student learning (*ERIC digest*).

I

Interdisciplinary: Topics or themes that cross traditional discipline or area boundaries, like physical science, humanities, and social science. In *ePortfolio Working Glossary*.

<http://eportfolio.cascadia.ctc.edu/students/help/glossary.asp>

L

Learner-centered: the learner's needs and unique characteristics are at the center of decision-making (CLDT); learners are encouraged to choose their own learning goals and/or projects, based on the belief that people have a natural inclination to learn.

www.teleport.com/~caphill/edterms.html

Learner-centered: In a learner-centered environment, employees and institutional policies, programs, and

practices focus primarily on the special needs of the individuals the college serves. (O'Banion). See <http://www.league.org/lleabs0399.html> for a distinction between learner and learning. In *ePortfolio Working Glossary*.

<http://eportfolio.cascadia.ctc.edu/students/help/glossary.asp>

Learning community: a variety of learning strategies designed around a common theme or question, so students have opportunities for deeper understanding and integration of the material they are learning and more interaction with one another and their teachers (WA Center). Learning communities can range from a cohort of students who take classes together which the faculty don't coordinate (e.g. FIG) to programs of coursework in which faculty team-teach. In *ePortfolio Working Glossary*.

<http://eportfolio.cascadia.ctc.edu/students/help/glossary.asp>

Learning-centered: Learning, not teaching, is at the center of decision-making. Learning-centered organizations make learning their highest priority. They place learning first in every policy, program, and practice (Launching a Learning-Centered College, O'Banion, p. 2).

<http://www.league.org/lleabs0399.html> for a distinction between learner and learning. In *ePortfolio Working Glossary*.

<http://eportfolio.cascadia.ctc.edu/students/help/glossary.asp>

O

Outcome: a skill, ability, attitude or knowledge demonstrated by the student upon exiting a course, program or college; a clear, operationally defined and measurable educational goal understood by learners and significant enough to drive the curriculum (CLDT); an operationally defined educational goal, usually a

culminating activity, product, or performance that can be measured. In *New Horizons on web*.

Outcome-based: Educational practice that ensures students master outcomes; an educational system where learning outcomes (goals) drive the efforts of the entire system. This is accomplished by determining the outcomes to be achieved by students, doing everything possible to help students achieve those outcomes, and assessing results (Portland CC). It is an education theory that guides curriculum by setting goals for students to accomplish and focuses more on these goals, or outcomes, than on "inputs," or subject units. In *Educ Week on Web*.

P

Permissions: A function that allows or prevents participants from seeing or performing certain tasks in a tool depending on their Roles. Site owners can set different permissions for different tools. In *Indiana University Information Technology Services Glossary*.

<http://kb.iu.edu/data/aqhz.html>

Portfolio: A collection of work that testifies to a students' acquired knowledge or skill. Portfolios are generally used to apply for credit by showing meaningful life experience that is equivalent to traditional coursework. In *Jamie Littlefield*:

<http://distancelearn.about.com/od/glossary/g/glossportfolio.htm>

Portfolio: A systematic and organized collection of student work that documents a student's efforts, progress or achievement of an intended outcome. In *ePortfolio Working Glossary*.

<http://eportfolio.cascadia.ctc.edu/students/help/glossary.asp>

Portfolio: A portfolio tells a story. It is the story of knowing. Knowing about things... Knowing oneself... Knowing an audience... Portfolios are students' own stories of what they know, why they believe they know it, and why others should be of the same opinion. In *Paulson & Paulson, 1991, p.2.*

R

Reflection: For each artifact's expectation, you will submit a reflection that provides evidence demonstrating that you have met the requirements of the expectation. In *Indiana University Information Technology Services Glossary.*

<http://kb.iu.edu/data/aqhz.html>

Repository: Your ePortfolio repository is a place to store the artifacts, including assignments, essays, tests, reports, or videos, that you wish to associate with cells in a matrix. In *Indiana University Information Technology Services Glossary.*

<http://kb.iu.edu/data/aqhz.html>

Role: Attributes assigned to site participants. Site owners can assign site participants to one of two participant roles, each of which comes with certain privileges. The roles are Access, which grants the user the right to read content and add content to a site where appropriate, and Maintain (usually reserved for site owners), which grants the user the rights to read, revise, delete, and add both content and participants to a site. In *Indiana University Information Technology Services Glossary.*

<http://kb.iu.edu/data/aqhz.html>

S

Scaffolding: The scaffolding is the framework of your matrix. You can use a PUL Matrix, which has established levels and criterion for the scaffolding. Or, you may define your own matrix settings. In *Indiana University Information Technology Services Glossary*.

<http://kb.iu.edu/data/aqhz.html>

T

Teacher portfolio: “It includes documents and materials which collectively suggest the scope and quality of a professor’s teaching performance. The portfolio is not an exhaustive compilation of all of the documents and materials that bear on teaching performance. Instead, it presents selected information on teaching activities and solid evidence of their effectiveness.” In *Seldin, 1997, p. 2*.

<http://ftad.osu.edu/portfolio/index.html>

Teaching: “Teaching is about making some kind of dent in the world so that the world is different than it was before you practiced your craft. Knowing clearly what kind of dent you want to make in the world means that you must continually ask yourself the most fundamental evaluative questions of all—What effect am I having on students and on their learning?” In *The Skillful Teacher (1990), Stephen Brookfield*.

<http://ftad.osu.edu/portfolio/philosophy/Philosophy.html>

Teaching portfolio: A teaching portfolio is a coherent set of material that represents your teaching practice as related to student learning. "Teaching practice" in its broadest sense extends beyond the obvious activities that go into teaching a course to include all activities that enrich student learning.

<http://www.umass.edu/cft/publications>

Editor's Note

Digital Portfolio as a strategy for teachers' professional development is the product of the collective contribution of the project partnership under the same designation.

The authors made an outstanding contribution effort to (i) gather information in order to state the current educational situation in their countries and produce the National Reports; (ii) analyse and research the main features to produce a comparative synthesis, allowing the establishment of a common work basis and (iii) produce coherent texts under the diverse agreed themes.

They all have contributed with writings that reflect expertise and provided us with useful and helpful assistance and feedback throughout the revising and editing process.

The group of authors devoted extensive time and extra energy to launch this publication within the foreseen deadline. We thank them deeply.

We also wish to thank the institutions involved in the project for all the support given which has very much contributed for the achievement of this study.

The editor

Maria Adelina da C. Laranjeiro

THE INSTITUTIONS

The Institutions

The DigiFOLIO project involves the following institutions:

The Hague University of Professional Education, The Netherlands

<http://www.haagsehogeschool.nl>

The Hague University is one of many Dutch institutions of higher education seeking to answer the needs of students and the future employment environment. A polytechnic with 37 study programmes, has a total of 16 000 students and 1 200 teaching staff. The participant teachers in the project are experienced ICT trainers and Quality Curriculum specialists. They are also experts in evaluation, improvement of programmes and dissemination of pilot studies. Furthermore one of the participants from this institution, being the international coordinator, has also a large experience in participating and coordinating Comenius actions and Erasmus, Minerva and Leonard projects.

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Palmenia Centre for Continuing Education, Helsinki University, Finland

<http://www.helsinki.fi/palmenia/>

It is the largest university-based continuing education institution in Europe. **ICT Learning Centre** is a unit of Palmenia that focuses on developing learning and teaching using new information and communication technologies in primary, secondary, vocational and higher education. ICT Learning Centre has been involved in several national and international research and development projects

related to educational technology. During the last few years the Centre has organised courses on the creation and use of digital portfolios in education. During the last few years the Centre has organised courses on the creation and use of digital portfolios in education. This partner will be involved in all the activities agreed for the project, namely in what concerns the design and implementation of the training course as well as the monitoring of the web based support activities.

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This institution is a Semi-Public Authority, which represents 48 regional CLB centres in the Flemish Community of Belgium. CLB centres are organised/subsidised and inspected by the Ministry of the Flemish Community (Department of Education), having the responsibility of offering support and consultancy to pupils, parents, teachers and schools, primary and secondary in the areas of career consultation, learning and social development, and preventive health supervision, for all pupils. Work activities are concentrated on pupils and their educational environment, primarily: in case of learning problems, social-emotional problems, career choice problems, and health & developmental problems.

CLB centres offer also training and consultation for school staff and the school as a whole.

Contributing Researchers:

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<http://www.tukkk.fi>

This institution has a large experience related to e-learning. The used approach follows the constructive paradigm, being the teacher regarded as a tutor in the learning process. This institution is involved in the development of courses and learning environment allowing a better cooperative learning. Whereas technology is concerned the learning environment is based on WebCT. This Institution is part of the Finnish Virtual University. The Turku School of Economics and Business Administration provides higher education and research in the field of business science.

The school offers graduate, postgraduate and continuing education, and conducts both basic and applied research. The School's key areas of expertise comprise Accounting and Finance, Management and Organization, Marketing, International Business, Logistics, Entrepreneurship, Economics, Information Systems Science, Economic Geography, Economic Sociology, Business Law, Economic Mathematics and Statistics, and Futures Studies.

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<http://www.svatojanskakolej.cz>

St. John College provides qualified training in the field of teaching and education. Great attention is paid to music and art education, then also handicrafts (ceramics and work with textiles) and drama apart from pedagogy, psychology, philosophy, biology and ecology.

Expertise in inter/cross-cultural education and experience in meetings/workshops/projects at local, regional, national (mainly the kindergarten teachers education: regular courses / meetings / trainings) and trans-national levels. Some teachers were trained recently for managing the distance learning (e-learning) courses and/or worked as tutors.

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The Faculty of Psychology and Education, University of Lisbon, Portugal, is organized in two main areas: Psychology and Education comprehending the following departments: Teacher Education, Sociology of Education, School Administration, Curriculum and Evaluation.

The Faculty carries out several research projects in connection with basic and secondary schools and is responsible for many courses and other activities concerning either pre-service or in-service teacher training.

The aims of the Faculdade de Psicologia e de Ciências da Educação of the Lisbon University are teaching and research in the complementary areas of Psychology and Education.

In what concerns its relations with the educational system the focus is on the wide experience in pre-service and in-service teacher training in connection with schools and Teacher training school centres, postgraduation of teachers and trainers in different areas of specialization and research.

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Limburg Catholic Institution for Higher Education is an institution of higher education with a profession-oriented approach, in other words a polytechnic or a university for professional education. KHLim is affiliated with the Associatie KULeuven, a consortium of academic universities and polytechnics around the famous Catholic University of Leuven. The scientific research by means of projects, development and practice of the arts and social service are important components of the Katholieke Hogeschool Limburg. The building up of an environment for profession-oriented and existence-oriented formation, and so concentrate on the competence development of relation skills, critical assertiveness and a wide social interest. The Katholieke Hogeschool takes also responsibility within the own dynamics of the Flemish Community socially, economically, technically, socially as well as culturally. This institution is also involved and publicly recognized both in initial teacher training and in-service teacher training.

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The coordinating institution is located in Sintra. It is a non-profit teachers' regional association, created in 1992 with the main purpose of supporting teachers of all levels and enhancing their professional development. Altogether APS cooperates in a regular basis with 140 schools both public and private. Its work is recognized by the national authorities in the field of education and it is supported by the Municipality of Sintra, considering the significance of its initiatives for the teachers and schools of the region, as well as by the Portuguese Ministry of Education, through the European Programme PRODEP III, which supports its annual plan of in-service teachers training.

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Digital Portfolio as a strategy for teachers' professional development

The project **DigiFolio** intends to bring a contribution to the professional growth of teachers by giving them the know how to use new educational resources, approaches and strategies.

Schools and society have deeply changed in the last few years. The increasing diversity of students, the social changes that have been occurring, the impact of the generalised use of ICT and the latest research results on how students learn and how and what they should be assessed for, set the need for professional development. There is a call for changes in the educational approaches, giving emphasis to the understanding of the context in which the learning process takes place. Education should provide effective tools to adapt to and to function over time in a changing society that demands a lifelong learning process.

Through the use of portfolios teachers and students can develop a shared understanding of what constitutes quality work and acquire a common language for evaluating students' accomplishments. The process of developing digital portfolios can foster and document evidence of competencies and guide long-term professional development and are recognised as a reflexive and proactive means to achieve a global vision of one's learning path with the advantage of increasing students' skills and competences in the use of ICT.

