E-PORTFOLIO IN EDUCATION
PRACTICES AND REFLECTIONS

Edited by

Fernando Albuquerque Costa

Maria Adelina Laranjeiro

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INTRODUCTION
ELECTRONIC PORTFOLIOS
A DOUBLE CHALLENGE FOR TEACHERS

The present publication addresses the use of digital portfolios in educational context and it is one of the latest dissemination activities of the Digifolio project – *Digital Portfolio as a strategy for teachers' professional development,* a COMENIUS 2.1 project which was carried out between 2005 and 2008. It involved several universities and teacher training institutions from five different European countries.

The project, which main focus was the reflection on the potentialities of portfolios and digital technologies in the perspective of teachers' professional development, came to its end with an international seminar which aimed at disseminating the work produced in the frame of a previous teachers training course, as well as allowing and welcoming the contribution of other education professionals with their practices and reflections on the above-mentioned thematic.

Although it was impossible to include in this publication all the papers presented at the international seminar, we consider the present compilation a meaningful set of the ideas exchanged and of the reflections produced, during the seminar, by the more than a hundred participants who came from thirteen countries where the subject of digital portfolios used for educational purposes starts being in the centre of most educational discussions.

In fact, though the experience of using digital technologies for designing and building educational portfolios is still incipient, as it was possible to confirm in the first research survey and systematizing work carried out in the different countries involved in Digifolio project (Costa, Rodrigues & Peralta, 2006), there are clear evidences of the interest on digital portfolios in Education, at least in what concerns the official policies concerning either to teachers or to students.

In spite of their recognized potentialities, namely as an alternative learning and assessment strategy in relation to the traditional school work organization, there are emergent difficulties not only related with the exigency

imposed by the use of portfolios but also those arising from the use of digital technologies for their accomplishment.

These difficulties are specially felt by the teachers who didn't have a specific training in the use of new technologies for pedagogical purposes and need an added investment in order to develop the required competencies allowing them to use and understand how technologies can help to achieve the designed learning objectives with the use of portfolios.

Thus, this publication must be read keeping in mind this perspective, allowing both the reflection upon the potentialities of the portfolios in the learning process and the way digital technologies can help to attain that aim.

With diversified approaches and different foci, having as reference very different contexts, we hope the texts now presented can somehow contribute to the reflection on this subject, being at the same time a good indicator of the concretization level of these new ways of teaching and learning.

In the first Chapter (*Educational potential of e-portfolios: from student learning to teacher professional development*), Maria João Gomes introduces the subject stressing the fact that portfolios are a work strategy both for teachers and students and even though used with different aims they are a common learning opportunity.

In Chapter 2 (*A theoretical approach to the digital portfolio: a strategic method of knowledge management in the university*), Maria Isabel Valdizán Garcia and Julio Mata Melo deal with the subject of portfolios at university level as a response to the traditional learning and teaching processes and to the challenge imposed by the digital technologies in what concerns the access to knowledge, highlighting their enormous potential in this same specific aspect.

In Chapter 3 (*The experience of a digital teaching portfolio as an orientation factor at the University of Burgos*), Maria Sonia Frías González and Beatriz Izquierdo Ramírez also refer to the university context, reporting an experience of portfolios usage at teachers' level in which the main challenge seems to be the necessary changes, mainly at a methodological level.

Maria José Loureiro, António Moreira and Maria João Gomes explore in Chapter 4 (*ePortfolios and eArgumentation*) the potentialities which the on-

line learning environments and the WEB 2.0 tools can open to the development of the students' argumentation skill, using it for the production of richer and more meaningful learning portfolios.

In Chapter 5 (*Digital portfolio as a strategy towards teachers' professional development*), Maria Adelina Laranjeiro, Cristovalina Afonso and João Carlos Sousa introduce, in short, the project Digifolio and suggest some tips that may be helpful for teachers and students in the process of a portfolio building.

Chapter 6 (*Digital portfolio as a strategy for teachers' professional development: lessons learned from an international course*), presented by Ruben Jans and Valère Awouters report the objectives and the organization of a teachers' training course carried out in the frame of the Digifolio project in which twenty two teachers from different countries all over Europe have taken part.

A strategy allowing teachers to make their own analysis of the different digital technologies, recognizing their usefulness for the portfolios building, is the theme of Chapter 7 (*Analysing ICT tools for portfolio educational goals*), under the responsibility of Fernando Albuquerque Costa and Elisabete Cruz.

Anne Wade, Philip C. Abrami, Elizabeth Meyer and Beverley White, explain and document, in detail, in Chapter 8 (*ePEARL: Supporting learning using electronic portfolios*), the advantage of a digital suitable tool for the building of students' and teachers' portfolios and the pedagogic guidelines underlying its use.

In Chapter 9 (*Using the digital portfolio as support in eyewitness subjects*), Juan Casanova Correa, Francisco Pavón Rabasco and Montserrat Vargas Vergara summarise a research study carried out in Spain on the teaching staff of 11 universities with the support of the digital platforms, including educational methodology, and the type of activities and evaluation tools which have been used.

Finally, in Chapter 10 (*The use of digital portfolios in Portugal)*, Fernando Albuquerque Costa, Maria Ângela Rodrigues, Maria Helena Peralta and Mónica Raleiras, present the results of a preliminary study done in Portugal about the use of digital portfolios for educational purposes.

We hope that this set of texts can help the reader to better understand the educational use of electronic portfolios and the double challenge that teachers are faced with.

Fernando Albuquerque Costa
Maria Adelina Laranjeiro

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EDUCATIONAL POTENTIAL OF E-PORTFOLIOS

FROM STUDENT LEARNING TO TEACHER PROFESSIONAL DEVELOPMENT

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INTRODUCTION

The construction of a portfolio may be based on a variety of aims. It can, for example, act as a strategy for encouraging learning, serve as a professional or academic evaluation instrument, be an "argument" in the search for employment, a means for promoting or marketing a product or company or a record of personal or professional development. In an educational context, most portfolios fit into the following three categories: "student e-portfolios, teaching e-portfolios and institutional e-portfolios" (see Lorenzo & Ittelson, 2005, p. 1), however other categories that are not solely related to the creation of portfolios may also be considered.

A diversity of contexts and aims underlying the implementation of portfolios, namely in educational and school contexts, have led Helen Barret (2005) to state that the term portfolio should always be accompanied by an adjective or modifying term to describe the purpose for which it is being or has been created. Nevertheless, one should always be aware of the fact that the construction of a portfolio can frequently come under more than one aim at the same time:

> [a] student e-portfolio, for example, can be used to showcase accomplishments. It may be shared with a prospective employer or used to document specific learning outcomes in a course and can include description, rationale and discussion of digitized artefacts, resulting in a powerful tool for representation, reflection, and revision.

A teaching can be used in a similar fashion, to showcase a faculty member's accomplishments for career-related purposes. It can also be a collection of course — or discipline — related plans, strategies, and artefacts to be shared with colleagues, which often encourage improved teaching and learning (Lorenzo & Ittelson, 2005, pp. 2-3).

In educational and school contexts, portfolios can be used to focus on distinct contexts:

– the school, by adopting itself as the school's means of presentation and publicity
– the pupils, by acting as a strategy to encourage learning and/or evaluation
– the teachers, by acting as an instrument/process of personal development and/or performance assessment.

In this text we will focus on some aspects regarding the portfolios of teachers and students with particular emphasis on *webfolios,* taken here to mean online versions of *e-portfolios*, which, by the same token are taken to mean

... a digitized collection of artefacts including demonstrations, resources, and accomplishments that represent an individual, group, or institution. This collection can be comprised of text-based, graphic, or multimedia elements archived on a Web site or on other electronic media such as a CD-ROM or DVD. An e-portfolio is more than a simple collection — it can also serve as an administrative tool to manage and organize work created with different applications and to control who can see the work. E-portfolios encourage personal reflection and often involve the exchange of ideas and feedback (Lorenzo & Ittelson, 2005, p.1).

PORTFOLIOS: FROM STUDENTS TO TEACHERS

We may identify two main areas of portfolio use/adoption in an educational context. On the one hand, we have a large number of references to portfolios in contexts of basic and continued training, frequently regarded as an instrument to assess performance, but also as a process of professional development. On the other hand, in the case of students from various educational

levels, portfolios often take on the role of presentation portfolios, but also, and more importantly from a pedagogical perspective, they are often learning portfolios and/or assessment portfolios, since it is not always possible to establish clear boundaries between these categories, as far as the aims and roles at the root of the creation of a portfolio are concerned. A portfolio constructed on the basis of being an assessment instrument should display both "products" and "processes". Thus, it also becomes a learning portfolio by including aspects of the students' learning processes, by highlighting its evolution in a variety of domains and its reflections on the actual process itself and is able to be used as a strategy for promoting metacognition. This same idea is defended by Scallon (2003, referred to in Alves, 2007) for whom portfolios are learning and assessment instruments grounded on this capacity to get the student involved in his/her assessment (self-assessment), reflecting on his/her learning (metacognition) with a view to carrying out actions so as to improve (self-regulation). These principles are equally pertinent to pupils/students in the various levels of schooling, teachers in the process of basic training and active professionals with an outlook based on life-long training and professional development. "E-portfolios have the potential to enhance teaching, learning, and assessment practices" (Lorenzo & Ittelson, 2005, p. 1).

REGULATING TEACHING AND LEARNING ACTIVITIES

By constantly examining portfolio content, both teachers and pupils can regulate their teaching and learning activities, introducing adjustments when necessary (Asturias, 1994, p. 698). Indeed, it is possible for teachers to detect what pupils think and feel, how their reasoning is processed, what kind of attitudes they display towards a theme and many other aspects in their writing (reflections, reports, diaries, etc.) Teachers can detect erroneous ideas, requests for help or indicators of success regarding certain areas taught. Garrison (1999, p. 94) refers to the fact that even when applied over a relatively short space of time, portfolios have an important role, for example, in the identification of pupils with needs in terms of learning opportunities and even in the identification of pupils requiring extra help.

Monitoring, on the part of the teacher, of the developmental processes of students' portfolios, may serve as a source of reflection on his/her

actual practices, leading him/her to question principles, strategies and teaching methodologies and to be encouraged to look for new approaches, thus, promoting his/her professional awareness.

ENCOURAGING COMMUNICATION
AMONG TEACHERS, PUPILS AND PARENTS

Developing portfolios may be a way of bringing families and schools together, promoting better family access to and knowledge of pupil performance and productions. In their search for greater parent involvement and awareness regarding student activities and learning, teachers may initially explain to parents what the aims of the portfolio are, how it will be developed and what kind of impact it will have on the assessment of students. Crowley (1993, p. 102) points out that each example set out in the portfolio reflects actual student effort and can display students' performance to both teachers and parents in more detail, "much more than an abstract classification figure". Koelper and Messerges (2003) describe a study in which the portfolio enabled parents to acquire greater knowledge about their children's progress and learning:

> The portfolios were also a success with the parents. (…) A set of parents were impressed how their child had grown from the first artefact to the last artefact in their portfolio. (…) The final product helped aid the parents in understanding the academic growth of their child in mathematics (Koelper & Messerges, 2003, p.37).

Several authors mention that during the development of a portfolio program, there is a higher possibility of communication among teachers, students, parents and other educational agents regarding student learning and expectations (Asturias, 1994; Crowley, 1993; Lambdin & Walker, 1994; Stenmark, 1991).

The moments for selecting material for the portfolio are privileged opportunities for developing the interaction process between the teacher and student (Leal, 1997, p. 11). Jean Stenmark (1991) also refers to the dialogue among students, teachers and parents. Dialogues between parents and children are made easier with the portfolios, especially when the students take the portfolio home, when parents can take a look and talk about their children's

learning and progress. On the other hand, and in the sense that the portfolios of pupils also highlight the practices of teachers, parents can also have a better idea about the kind of work carried out by their children's teachers.

PROMOTING A CHANGE IN EDUCATIONAL PRAXIS

Not only are portfolios proof of curriculum and student involvement in activities, they also indirectly record the educational activities promoted and presented by teachers. Furthermore, they highlight, albeit partially, the aspects to which the teacher attributes most value and, thus, provide stimulation. Such content may be analysed by the parents of pupils, school teachers and all those who look at the portfolios. In this context, pupil portfolios are potentially excellent starting documents for a critical reflection on teacher practices, leading teachers, themselves, to reflect on what is most important in terms of student learning or to discuss their teaching approaches and strategies.

Many of the authors who have experimented with portfolios in the classroom with their pupils refer to the change in educational praxis as something inherent to the actual use of portfolios. In his text Stenmark (1999, p. 35), for example, recalls a classroom situation in which portfolios were used and where the teacher's "style of teaching" actually changed. Diana Lambdin and Vicki Walker (1994) also mention how the decision to adopt the use of portfolios led to a change in their way of teaching and assessing.

The potential portfolios have in bringing about a change in pedagogical practices and school assessment has led us to the conclusion that its adoption may not only benefit students but also construct an excellent opportunity for the professional development of teachers, since they are subsequently guided by their reflection on their own educational *praxis*. Kuhs has even said "perhaps the most important argument favouring the use of portfolios is its power to bring about change" (1994, p. 335).

Portfolios have been used in basic teacher training as an evaluation instrument but also as an instrument for the development of reflection practices. In the case of professionally active teachers, portfolios have served as instruments for evaluating professional performance. Indeed, this practice has been reinforced over recent years (see Milman, 2007) and has proved to be indicative of professional development.

FROM PAPER TO THE WEB

As well as a broadening of contexts and aims associated with the development of portfolios, from their initial adoption in professional fields more related to image, art and graphic design up to their adoption in other areas such as education, the portfolios themselves, as well as the entire spectrum of contexts in which they have developed, have become diversified.

Technological evolution has come to create alternative forms of constructing portfolios, such as digital development. However, this does not simply amount to an updated or enriched technological version of the paper portfolios. Nor does it merely refer to overcoming limitations associated with the "paper" version which, since they are not of a pedagogical nature, restrict the full use of some of the most important characteristics of portfolios, in educational terms. Digital versions provide an entire range of new possibilities which, up to not so long ago, were unavailable in more conventional formats and versions for implementation contexts.

Digital portfolios facilitate the incorporation of multimedia characteristics which are common to digital portfolios constructed and made available offline (in cd-rom, for example) or online (available on the Web). Still, digital portfolios constructed and made available online are frequently found to have features that maximize some of the potentialities that are normally attributed to portfolios. Online digital portfolios have improved and optimised visibility, enabling teachers, pupils and families to have simultaneous access, facilitating and providing conditions for more frequent and rapid feedback on the development and content included, thus being more efficient. The creation of digital portfolios, particularly the online version, implies the development of a wide range of digital competencies on the part of both pupils and teachers, thus, representing an additional advantage to its adoption:

> [i]n general, e-portfolios are helping students become critical thinkers and aiding in the development of their writing and multimedia communications skills. E-portfolios can help students learn information and technology literacy skills and how to use digital media (Lorenzo & Ittelson, 2005, p. 3).

Furthermore, the fact that there are several online communication services available on the web enables the online portfolio to be developed in a more

collaborative manner, bringing benefit to its authors by means of feedback from all those who were given access to it. Such benefits are directly related to the digital and online dimensions of web-folios: "[t]he benefits of an e-portfolio typically derive from the exchange of ideas and feedback between the author and those who interact with the e-portfolio" (Lorenzo & Ittelson, 2005, p. 2).

TO SUM UP...

The adoption of the portfolio in educational/school contexts has become increasingly more frequent and diversified. Its construction by pupils is mainly conveyed as a strategy based on learning promotion and as an assessment instrument/technique of such learning, while, in some cases, it consists of real metacognitive exercises. As far as teachers are concerned, the construction of portfolios may correspond to a need for reflection on their professional convictions and practices. In these cases, portfolio construction is associated with effort put into professional development. In other contexts, teacher portfolios follow a logic based on the evaluation of performance or professional presentation. Whether developed by students or teachers, portfolios have come to adopt digital and frequently online versions, thus, broadening conditions so as to take on a multi(hiper)media dimension, to acquire greater visibility and improved technological competencies so that they may be developed in a more interactive manner and become a real collective and collaborative dimension.

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A THEORETICAL APPROACH TO THE DIGITAL PORTFOLIO

A STRATEGIC METHOD OF KNOWLEDGE MANAGEMENT IN THE UNIVERSITY

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Information is not a synonym for knowledge, nor does exposure to information guarantee learning

INTRODUCTION

The university institution, entrusted with the mission of research, teaching and development, and having social inclusion, service quality, internationalization and institutional cooperation as its essential functions, should, both by nature and by definition, be considered as an organization in which knowledge is generated, administered and managed. Accordingly, this communication sets out from a conceptual perspective to study and describe the implications arising from the administration and management of knowledge in universities, as a prior step to drawing up new projects and alternative models in teaching/learning processes, particularly the student's digital portfolio, so as to be able to map out the future of the university, given that its activities are intimately linked to knowledge.

Knowledge management, as quality criteria in the institution of the university, represents a priority area of study in both an organizational and a technological setting. Given the far reaching importance attributed to the recognition of knowledge as an active principle in those two latter fields, it follows that the satisfactory management of such a valuable and significant resource requires significant effort. Thus, universities whose activity is intimately related to the creation and dissemination of knowledge can not remain by the wayside and should pay special attention to the development of knowledge management programmes, as priority mechanisms for progress and innovation; and in new

educational paradigms centred on real and autonomous learning, through the use of new educational techniques.

NEW TECHNOLOGIES, NEW ALTERNATIVE METHODS: THE STUDENT PORTFOLIO

Our interest, as a consequence, lies in the implementation of the "portfolio" in a web-based setting that is centred more on learning than on teaching processes, more on the protagonism of the learner as the person that generates knowledge than on the teaching activity. In general the "digital portfolio" may be understood as an online application that allows the management, organisation and distribution of personal information relating to academic or professional life. It is selected by the student-users themselves so as to offer information that represents an alternative to conventional information relating to educational achievements, training and/or reflections on their own learning process at university (Barrett, 2003).

In the words of Coll (2004-2005, p. 5): "The keys to understanding and to assessing the scope of its educational impact, including its eventual impact on improved learning outcomes, are not to be found in ICT itself, but in the activities carried out by teachers and students thanks to the possibilities afforded to them by ICT for the communication, exchange, access and processing of information".

In this sense, the "Digital Portfolio" that is made possible thanks to ICT is a technological and evaluatory instrument that belongs to the student and is assessed by the teacher. With the help of a software application (CD, Web) that the portfolio administers and uses, it enables and guides the students' learning processes, manages resources and establishes mechanisms for the personalized assessment of learning outcomes. It therefore provides, broader and deeper knowledge on any one student's real learning outcomes and at the same time provides fundamental information on the intervention and the degree of effectiveness of the teaching staff. We may therefore understand the portfolio as a tool that allows an ongoing, integral, integrative and integrated follow up of the learning/teaching process and of knowledge management on the part of the teacher and the learner. Some variations of the student-user's portfolio are: the electronic/digital portfolio and the teacher portfolio.

Together, they represent an educational perspective known as *Alternative Learning Methods*.

According to Barberà (2005), the electronic portfolio brings with it the possibility for diversification in the frameworks for expression. Multimedia language that is learnt as the course unfolds is an option to express the process, and in that sense the wealth of production with respect to the diversification of meaning is even greater. It is transformed in this way into another example of the practice and application of the contents developed on the course. In this context, it is defined as the instrument that uses technological tools with the aim of demonstrating multiple evidence of the learning process in different mediums (audio, video, graphics, texts). Hypertext is used to show with greater clarity the relations between objectives, contents, processes and reflections".

It should be made clear that the terms electronic portfolio or digital portfolio are, generally speaking, used interchangeably, although we may distinguish here between the electronic portfolio that, for example, contains analogical mediums, such as a videos or slides, and the digital portfolio, where all the resources in use are converted into a programming language. The benefits that the latter version brings with it are portability, and furthermore the integration of technology into its construction. The use of hypertexts allows relations to be established between the different elements, facilitating thought processes, reading and total access, above all when in the form of a web portfolio (Barret, 2000).

The growth of the portfolio as a teaching/learning method has been associated with the rise of Internet. In some universities and teaching centres, it is used in association with complex online assessment systems. Its graphic nature and ability to incorporate links between different digitalized evidence provides the student-user with the possibility of assimilating and integrating the learning tasks in a more stimulating, progressive and committed manner. It is a knowledge management system that swiftly enables information to be transformed into action and thereupon into knowledge in a manner that adapts itself to the peculiarities of the student-user; it also allows students, teachers, administrators and managers to create and distribute their educational work in a mutually supportive way.

KNOWLEDGE MANAGEMENT AND NEW TECHNOLOGIES IN THE UNIVERSITY

If we believe that learning is an active, meaningful and constructive process, oriented towards the achievement of goals, their achievement depends on the development of superior mental processes in the students. This conception implies a modification of the roles played by the subjects — learners and teachers — in the process (Mauri, 1993; Porlán, 2000; Solé & Coll, 1993). Thus the teacher must be a guide, a mediator between knowledge and the students and not a mere transmitter of information. For their part, students must assume an active role in the construction of their own learning.

Students have to use their personal knowledge to assume this active role, which is composed of a system of experiential meanings resulting from constructive interaction between personal meanings and the medium. This knowledge, according to Norman (1982), is socially conditioned and partially shared. In this respect, Porlán (2000) explains that "interaction between meanings and experiences takes place in a context of communication that conveys messages and meanings and is organized in the form of semantic designs and networks of an idiosyncratic nature. They are not cumulative sets of information but rather present an organizational structure based on knowledge schemes. This set of schemes makes up a complex, tri-dimensional structure that serves as a personal theory".

The Cambridge Dictionary defines the concept of knowledge as, "understanding of or information about a subject which has been obtained by experience or study, and which is either in a person's mind or possessed by people generally". From this standpoint, it is easy to see that knowledge as such is a socially meaningful construct that exists in a natural way for human beings and that is present and apparent in all of their activities throughout life. The critical point, according to Ríos Manríquez and Ferrer Guerra (2006) lies in how knowledge may be exploited (constructed, integrated, used) not only by the person that holds it at a certain moment in time, but also by the rest of the members of an organisation, such as a university, or society in general; whence the idea of Knowledge Management.

In this context, it is important to establish certain differences between two terms that are all too often confused: knowledge and information. Joia (2000) sets out the concept of knowledge, beginning by distinguishing it from

data and information, and states that data represent a set of discrete and objective facts referring to some event, while information corresponds to data with relevant purposeful attributes, which is to say that is based on a context, and finally the concept of knowledge is linked to the capacity for action and is therefore intuitive and difficult to define. On most occasions, knowledge held within an organisation such as the university is found within the minds of the teachers and learners (tacit knowledge: which arises from individual experience and involves intangible factors such as personal beliefs, perspectives and values.) as well as in documents (explicit knowledge: which can be articulated in formal terms and transmitted between individuals). We will, therefore, point out some differences that are significant when planning our work with the "portfolio" (Polanyi, 1966):

— Information has a passive connotation unlike knowledge that implies something active associated with a certain entity, generally a person.
— Information makes sense from a decision-making perspective; it has meaning but no context.
— Knowledge contains an informational element but is enriched by additional aspects that on many occasions are difficult to identify but that represent an added value.
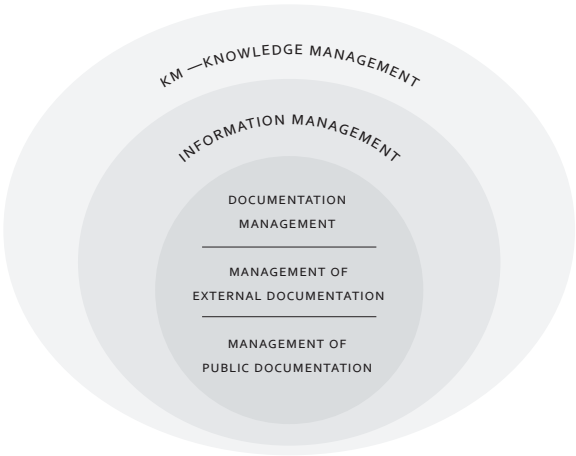
Another author, Mahclup (1980) sets out another significant classification, with five categories of knowledge:

1. Practical knowledge: useful for work and actions and important for individual decision-making.
2. Intellectual knowledge, which satisfies intellectual curiosity and allows adaptability, creativity and innovation.
3. Past knowledge, discussions and personal relations, which satisfy curiosity that is not strictly intellectual or desire such as a wish to be entertained.
4. Spiritual knowledge, associated with mystic or religious experiences, with values, ethics and morality.
5. Undesired knowledge, which is separate from one's own interests and is acquired accidentally.

Smith (2000) for his part considers that there are three types of knowledge:

1. Public knowledge, which is explicit, taught and shared on a routine basis.
2. Shared experience, which is shared by knowledge "workers" in their activity.
3. Personal knowledge, which exists tacitly in people's minds.

The most significant part of these classifications lies in the differentiation between tacit and explicit knowledge. Because of its characteristics, the latter becomes clearly identifiable, manageable and is present throughout the organisation whether through traditional mechanisms or paper-based mediums or through electronic publication on internal networks, intranet or even Extranets. Tacit knowledge, for its part, is much more difficult to capture and, as a consequence, to share, because it is associated in many cases with personal situations that are difficult to abstract, the challenge for many organizations is to achieve real management of this knowledge.

Nonaka (1991), considers that "tacit knowledge is highly personal, difficult to formalize and as a consequence difficult to communicate to others. It consists partly of technical skills (know-how), but it also has a very important cognitive dimension, consisting in mental models, beliefs and perspectives". This understanding leads Nonaka to suggest that new knowledge, in organisations generally arises from individuals, but in the process of being shared is

transformed into knowledge that is valuable for the firm as a whole, and that it is therefore possible to establish four knowledge creation patterns in any organisation, including universities:

1. *Tacit to Tacit*. This takes place when individuals (teacher/learner) share knowledge with other individuals and the latter are able to learn it through observation, imitation and practice, thereby converting it once again it into their own tacit knowledge, however neither two arrive at a systematic vision of their knowledge, and given that it never becomes explicit it can never be used by the organization as a whole.
2. *Explicit to Explicit*. Individuals can also combine discrete pieces of knowledge to make a new whole, however, in reality doing so does not imply any expansion of the knowledge base of the organisation.
3. *Tacit to Explicit*. When individuals are able to describe the basis of their tacit knowledge, they convert it into explicit knowledge and as a consequence the knowledge base is made to grow.
4. *Explicit to Tacit*. When the explicit knowledge is shared throughout the organisation, other individuals start to use it and they therefore broaden, expand and re-work it as their own tacit knowledge.
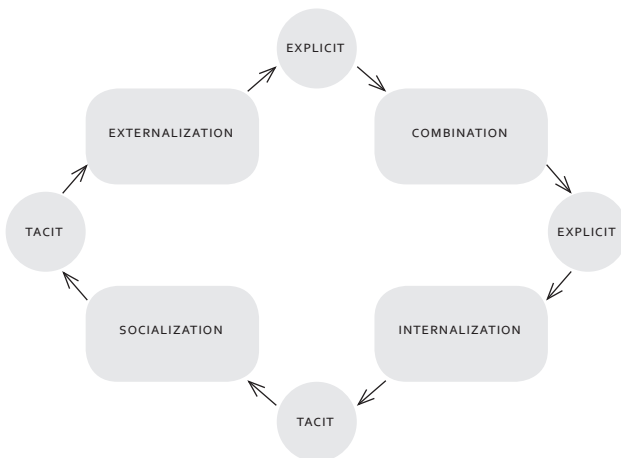
According to Nonaka, these four factors are in a permanent process of dynamic interaction, the result of which is the knowledge spiral, which expands to

higher levels, assisting and enriching organizational growth. This knowledge dynamic is promoted and reinforced by the "digital portfolio" through the preparation of its various working folders, allowing student-users:

— To transform information into knowledge and the latter into real and autonomous learning as an online evaluation, communicative and didactic tool, in three fundamental phases: 1. Planning, 2. Execution or setting in motion and 3. Revision, evaluation or reaction.
— To demonstrate evidence of constructive mental activity, in short, of their own learning processes, and to request the help required to continue learning at all times and to do so in a collaborative manner.
— To acquire experiences in order to develop the skills needed so that they adapt to change, have more versatile thought processes and are able to manage knowledge; understanding why, for what purpose and how they learn.
— To place themselves at the centre of the curriculum, so that they are able to express themselves, to participate and to undertake problem-based learning tasks in which their efforts and interests serve as important organisational elements.
— To put autonomous management, and the construction and publication of knowledge into practice, and to demonstrate evidence of having developed personal, professional, academic and educational skills and abilities.

The important challenges of educational investigation in ICT-supported environments and the new paradigms of educational design, such as "the portfolio", which are commensurate with the knowledge and the information society, facilitate progress coupled with a purposeful initiative (autonomous--supervised learning, development of autonomous management, personalised work rhythm, flexible and alternative learning itineraries) incorporating empowering educational models and strategies for life in all areas. Thus, the curriculum and the teaching/learning process is organised into open learning processes, where divergent reasoning and multiple perspectives (not only one correct viewpoint) are encouraged; students can choose and propose a variety of methods and activities, using the potential of cognitive tools (or semiotic instruments) associated with the most advanced technologies. Nevertheless, to do so requires instructive systems, which guide, assist and engage student--users in constant dialogue so that they can continually update information

on their progress, endeavours, attitudes and expectations, thereby allowing them to take on ever-more complex and socially relevant cognitive tasks, which are necessary for problem solving in complex, changing, and uncertain areas of academic, professional and/or personal life.

According to Díaz Barriga (2003), and other authors such as Hannafin, Land, and Oliver, (2000), as a basic strategy of the "portfolio", assessment within the teaching/learning process encompasses knowing, know-how and being; they centre on efforts and acquired abilities, on the assessment of generative tasks and on the follow up of self-regulating processes and mechanisms. It is important to explore not only what stated information has been acquired, but what specific abilities and orientations or attitudes are demonstrated in the form of complex socio-functional abilities. A vigorous expansion of instructional systems will take place not only in cognitive and disciplinary areas, but in areas relating to emotional, individual (personal-ethical), and social development. From this perspective, assessment meets two fundamental functions:

— To adapt the pedagogical-didactic measurement of the characteristics and motivation of student-users, and
— To determine the degree to which they have achieved their educational proposals.

In other words, assessment and/or self-assessment will allow student-users to regulate their own learning processes and reduce the gap between achieved and expected performance, thereby striking the right balance between strategic efforts and results when completing the proposed tasks, as well as discovering the relations that exist between what they learn and real-life aspects and situations. One point worth emphasizing is the idea that those involved in drawing up the instruction will not only be teachers or experts in educational and technical design, but the student-users themselves. In this respect, Reigeluth (2000) notes that a good part of what is designed will have to be done by the students themselves (designers-users) while they are learning, with the help of a software programme incorporating options based on the information gathered by the students, and with the assistance, support and orientation of the teacher-tutor. This is to say that the student-user will be able to request particular educational methods from the system, which will in turn advise and/or take decisions on their appropriateness.

CONCLUSIONS

In consequence, the student-user Portfolio is a teaching, learning and assessment method that comprises different sorts of contributions and productions made by student-users. These offer more authenticate information on their learning/teaching processes and allow students to weigh up their capabilities in the context of a given discipline or field of study. Thus, these contributions and productions inform on the personal process they are following, allowing both students and the learning community of which they form part to analyse their efforts and achievements in relation to pre-set learning goals and assessment criteria.

The portfolio as a teaching/learning model is based on the theory that assessment affects the way in which a student-user will go about learning. It must be borne in mind that knowledge is constructed and is a social construction, due to which learning experiences are necessary that allow the application of acquired knowledge to new problems and situations, thereby strengthening the development of complex abilities (practical, cognitive, personal and social...). The accumulation of experiences, knowledge or information that manages to shape an individual throughout life will allow that person to envisage and to formulate hypotheses, to verify them, and to construct new knowledge, in short, it allows the individual to learn and to engage in self-development.

The student portfolio responds to two essential aspects in the teaching/learning process, entails a complete working method and didactic strategies for teacher/learner interaction; and, is moreover an assessment method that allows a set of evidences to be brought together and coordinated in order to arrive at an evaluation that is as closely as possible aligned to reality, which is difficult with other more traditional assessment instruments that provide a more fragmented vision. Its potential lies in identifying complex skills.

OBJECTIVES

— To guide student-users in their educational activity and in their perceptions of their own progress, emphasizing what the student-users know about themselves and in relation to the course.
— Motivate student-users and provide them with incentives so that they show concern for their learning process, making the necessary effort to design and plan in order not to make do with and/or resign themselves to first results.
— Highlight the importance of autonomy, of individual development and of collaborative and cooperative work in solving specific problems.

— Develop the capacity to find, select and interpret information, in order to formulate, analyse and solve problems.
— Acquire good cognitive and social habits allowing the involvement of teaching staff and students in the organisation and development of the tasks.

POSSIBLE ADVANTAGES
— Student-users know the criteria by which they will be assessed from the outset, as it is a question of on-going work during which they quickly become aware of the effort that is required and achievable results.
— It allows the use of continuous evaluation in the learning process.
— Student-users, alongside the assistance of the teacher, are the managers of their own learning processes. They therefore develop knowledge management ability.
— Student-users may share the outcomes with the learning community (with fellow students).
— The portfolio is a personalized product, for which reason no two are alike.

POSSIBLE DISADVANTAGES
— A degree of insecurity over both decision making and the feeling that it is being done well.
— A high degree of involvement, effort and commitment on the part of the teaching staff towards the students, in cases where work routines, assessment criteria and mechanisms for monitoring and self-regulation are not well established.
— It requires a high degree of commitment, intellectual discipline and/or working methods and responsibility on the part of students.

PREPARATORY PROCESS
Sections that may be identified (Barberà, 2005):

1. A guide or list of contents that the teacher and the student-user jointly prepare, and which will define the type of work and the teaching strategy.
2. A justification and introduction to the portfolio that sets out intentions, beliefs and the initial starting point for a specific topic or area.
3. A set of folders that make up the central core of topics in the body of the portfolio. They contain documentation that has been downloaded and

selected by the student-user showing the learning outcomes achieved in each of the selected topics.

4. A conclusion and end as a summary of the learning process in relation to the contents on display.

In addition to the choice of a portfolio, the following points have also to be defined:

— Authorship and audience of the portfolio
— Contents to be developed
— Objectives and abilities
— Specific structure and organisation
— Assessment criteria

POSSIBLE STAGES IN ITS DEVELOPMENT

The stages in the development of the portfolio by the students might be (Barberà, 2005):

Stage 1. Collection of evidence, which will be decided by the objectives and abilities expressed in the portfolio
   a) Information with different types of content: (conceptual, procedural and attitudinal or normative);
   b) Tasks undertaken inside or outside of the classroom (mind maps, press cuttings, exams, reports, interviews, etc.)
   c) Documents on different physical mediums (digital, paper, audio, etc.).
Stage 2. Selection of evidence, where the student-users chose the best works or those questions which best represent them and which demonstrate the positive developments and learning that is to be presented to the learning community
Stage 3. Reflection on the evidence. Where both the weak and the strong points of the process are highlighted and proposals are drawn up for improvement.
Stage 4. Publication of the portfolio based on a design and an orderly, clear and well-arranged structure that assists understanding and innovative thinking

RESOURCES

— Personal resources
— Polyvalent classroom/spaces
— Technological tools: computing language…
— Analogical medium…
— Portfolio with the evidence
— Bibliography

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THE EXPERIENCE OF A DIGITAL TEACHING PORTFOLIO AS AN ORIENTATION FACTOR AT THE UNIVERSITY OF BURGOS

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INTRODUCTION

This text describes a pilot experiment conducted at the University of Burgos that centred on the preparation of a teaching portfolio, drawing on personal experiences gained in the course of daily work as a university teacher. This Digital Teaching Portfolio implies a complete methodological turnaround in relation to earlier models of analysis or assessment that we have been using in the teaching/learning process; it being the teachers themselves that assume the role of collecting data on their teaching activities and that have the right and the duty to demonstrate their professional achievements. In much the same way as statements made in a research curriculum must be documented with evidence, so too must the preparation of a teaching portfolio be grounded in firm empirical evidence. To do so, we will set out the portfolio that was developed over the previous academic year, its theoretical assumptions, and its main outcomes.

The growth of the digital portfolio in this area as a teaching and learning method is linked to the rise of the Internet. Its graphic nature and its ability to create links between various forms of digitalized evidence provides the student with the opportunity of integrating learning in a positive, gradual and conscious way with a very appealing potential. In addition, it is a management system that allows students, teachers and administrators to create and distribute educational documentation.

In short, the electronic portfolio makes it possible to diversify the frameworks for expression. One option is to express the process in the multimedia language that is learnt over the course of the academic year, and in that sense

the wealth of production with regard to diversification of meaning is even greater. The advantages offered by this system refer back to its mobility, the integration of technologies in its construction, the use of hypertexts allowing links to be established between various components, which facilitates reflection and reading, and total accessibility, above all when in the form of a web portfolio (Barret, 2000).

Having established the need to use this type of tool in our daily teaching activities, we should not forget the relevance that is acquired by the new socio-educational context in which, in this case, the teaching portfolio will be developed. A new university area will create the need to use tools that are useful in order to comply with new educational requirements, their innovative objectives and goals to be reached, as well as the new profile for university teaching staff.

THE TEACHING PORTFOLIO IN THE NEW UNIVERSITY CONTEXT: THE EUROPEAN HIGHER EDUCATION AREA

The Bologna Process that began with the Declaration of Bologna signed in 1999 by the Ministers of Education of the European Union, marked an inflection point for the university system in Spain, opening up new changes leading to the creation of a European-wide environment for higher education. It is a process that authors such as Fernández (2006, p. 2) have declared to be unstoppable and with a limited deadline. There have been numerous initiatives set in motion by different European universities, including the University of Burgos, with the aim of harmonizing educational systems relating to higher education in Europe.

The principles of this Declaration, which centres on the development and strengthening of the sociocultural, intellectual and scientific dimensions in Europe, set out three fundamental goals (Fernández, 2006, p. 2):

— Competitiveness to attract students from EC countries and beyond;
— External and internal mobility of university personnel (teaching staff, students, administrative staff and services etc.);
— Employability, by focusing learning at these levels on what is relevant for the job market.

From this perspective, the role of university learning in a knowledge society, i.e. an increasingly complex and diverse society, calls for important changes in existing educational models. As pointed out by Monereo and Pozo (2003), the features of this new knowledge society must be learnt and taught in the university, which drives us toward a "perspective-based" conception of knowledge, leading us to accept its relative nature and to be able to develop it, despite the uncertainty and complexity that is demanded in the new scenario for higher education.

In this changing environment, since the commencement of the Bologna Process, the University of Burgos has been promoting different actions aimed at compliance with the current milestones and regulations, and with the temporal horizon of 2010. Thus, a renovated profile and role of the university teacher has emerged to confront the important changes that are required in the new educational context. In relation to this latter point, in 2005, the Teacher Training Institute of the University approved a *Plan de Formación en el Marco del Espacio Europeo de Educación Superior* [Training Plan in the Framework of the European Higher Education Area] with the aim of providing teaching staff with educational tools that drive quality teaching activities adapted to the new educational framework. To do so, three fundamental educational themes were drawn up:

— The new scenario for European Higher Education;
— Education centred on student learning and oriented toward their developing general and specific competencies;
— The use of communication technologies for professional teaching activities.

THE NEW ROLE OF TEACHING STAFF IN THE UNIVERSITY

In parallel to the Bologna Process, present-day society not only demands professionals with a great deal of knowledge, but also with the competencies and attitudes needed to confront the challenges that are part and parcel of this day and age, in other words it seeks the complete education of the student. In this sense, it is necessary to reformulate many methodological aspects of education and review the roles that teachers and students have to play in universities, in order to achieve these results.

The TUNING project points out that the new teaching/learning paradigm is student centred. This new situation, leads us towards profound changes in the roles that must be performed by the teacher, whose function is now that of a guide, a mediator and a tutor. University teachers must transform their profile of a presenter of material into that of a facilitator of student learning, as the teacher is no longer the protagonist of the educational process but a tutor or an expert guide in education, at the same time as a specialist in a scientific subject on the curriculum. Classes in the university classroom will be more dynamic, stimulating teamwork, with greater interaction between teacher and student. A significant reduction in lecturing gives way to situations of creative and cooperative learning where students think for themselves, such that the students become the protagonists of their own learning processes.

All of this will imply new roles for university students, who will work in more active ways and will design their own learning processes. The new learning model will entail more for students such that they will have to interact and voice opinions in the classroom, and to do so an increase in study hours will be necessary, beyond the taught classes, in order to prepare and analyze information. Thus, students will have to dedicate themselves to the university course as if it were their profession career; not only will they pass exams and subject modules, but they will also attain the standards that will subsequently be expected of them in professional life.

This new approach to the process of teaching/learning is, without a doubt, laying down the groundwork for the university system of the future.

The relation between teaching and learning is established through a series of processes such as understanding, reasoning, doing, applying, discovering, experimenting, feeling, seeing listening, explaining, deducing, etc.

The functions of the university teacher according to the new context are as follows:

— **To profile the professional skills and competencies that will be exercised by our students**
  The teaching staff will define possible relevant learning objectives. Some of the competencies that students must acquire: the capacity to communicate, to manage their feelings, to work in groups, to do so with ethical criteria in mind in a multicultural environment, to detect training needs and upgrade their knowledge etc.

— **Learning versus Teaching**
At present, the focus of attention is shifting to teaching/learning, the protagonists are now the students, the future professionals, and what is of importance right now is learning. Teaching activities will centre on professional skills that are required by society. We must define the learning activities in accordance with the actions of the students, and not those of the teaching staff. Questions occur to us with regard to these changes. What do our students have to be able to do? What should they learn? How much of this should they learn? How may I facilitate their learning and its application? How can I evaluate the acquisition of relevant skills and abilities? What are these? How can I help them to develop skills in order to identify their future educational needs? What types of attitudes are desirable in professionals? How may I encourage these? How can I measure their learning? What skills or abilities have working professionals regretted not having? How can I foresee the necessary professional skills in the near future? Is the educational level of the new intake of students sufficient? What is the assumed level when I start my teaching? How can I detect improvable points in teaching activity? Only after having made these considerations should I plan the programmes, the learning activities and the situations and tools for evaluation.

— **The teacher as the manager of the learning activities and certifier** before society of the acquisition of professional skills and abilities by the students.

— The teacher has to be a professional educator who requires **training** and **refresher courses for teaching**. These should be specific, regulated and systematic.

— Teachers have to be aware of their role as **social agents, attitude formers and professional and human role models**.

— The teacher must conceive of **learning as a conjunction between emotional and cognitive states of mind**. We are aware that it is not enough that they learn, students must not be passive receptors of knowledge but must be the constructors of their own learning. We have to be able to manage our students' rhythm of learning, cognitive styles, motivation, types of intelligence, etc.

— We have to be able to **use different techniques and teaching strategies in flexible ways**, mastering varied learning situations that are appropriate for the type of learning that is intended. We should improve traditional communication and incorporate varied didactic and technological resources in

a systematic way: work in small groups, audiovisual design and creation of interactive Cd-Roms, use of new technologies (interactive whiteboards, PC Tablet...) etc.

— It will be necessary to design evaluation tools that are developmental and summative or that certify educational outcomes in society, in a reliable and appropriate way with regard to whatever they are meant to evaluate.

— We shall have to be able to **investigate our own teaching practice**, in order to learn from such research and to continue improving it in such a way as to generate new knowledge in this area of teaching.

These changes imply both a personal and professional challenge, and should therefore be supported by the university. We should set out a gradual change for them, conducting an exercise of critical reflection to modify our own conceptions of both teaching and learning. We are also aware of those on the receiving end, the students, who form part of the traditional system and who, in the same way as teachers, may resist change.

THE TEACHING PORTFOLIO

The teaching portfolio, as we pointed out at the beginning, has implied a methodological turnaround in relation to earlier models of educational analysis or assessment. As teachers, we have taken on board the process of collecting information on teaching activities, having the right and the duty to demonstrate our professional vocation in this way. In much the same way as statements made in a research curriculum must be documented with evidence, so too must the preparation of a teaching portfolio be grounded in firm empirical evidence.

Our teaching portfolio is structured in the following way:

I. **Name of teaching staff:** Mª Sonia Frías González and Beatriz Izquierdo Ramírez

II. **Department/centre:** *Ciencias de la Educación* [Educational Sciences] *Facultad de Humanidades y Educación* [Faculty of Humanities and Education]

III. **Institution:** *Universidad de Burgos* [University of Burgos]

IV. Academic Year: 2007/2008

V. Contents:

V.1 CHECK LIST OF EDUCATIONAL RESPONSIBILITIES

Our responsibilities in our role as teacher and researcher are:

— To design a digital portfolio that will serve as a means for reflection and analysis in order to explain the learning needs, the context and the profile of the student's future professional activity, all of which is done in coordination with other colleagues.
— To create opportunities for individual and group learning
— To create actions leading to more autonomous student learning processes through tutorials.
— To evaluate the teaching/learning process
— To participate actively in improving the quality of teaching.
— To participate actively in the academic-organizational dynamics of the institution (University, Faculty, Department, Area, Committee work,...)
— To design, to develop and/or to evaluate research projects and teaching innovations for the institution and/or for scientific progress in our knowledge area.
— To organize and manage meetings, seminars, scientific symposiums and congresses, which stimulate communication, discussion, reflection, the exchange of ideas and the diffusion of scientific knowledge and its progress, as well as training in teaching methods and research.

— We undertake to prepare up-to-date and relevant scientific teaching materials, for the institution and for scientific progress in our area of knowledge.
— To communicate and disseminate knowledge, scientific progress, and the results of research and innovation projects at a local, national and international level.

At present the taught subjects are as follows:

1. 'Education for Leisure and Free Time' in the *Licenciatura de Pedagogía* [Pedagogy Degree]; 6 ordinary credits in the first term
2. 'Practicum' in the *Licenciatura de Pedagogía* [Pedagogy Degree]; 4.5 ordinary credits in the first term
3. 'New Technologies applied to Nursery Education'; 4.5 ordinary credits in the second term, to two groups.
4. 'Organisation of the Teaching Centre' in the *Diplomatura de Maestro especialista en Educación Especial* [Specialist Teaching Diploma in Special Education]; 4.5 ordinary credits.
5. 'Introduction to Sociology' in the various Teacher Diplomas; 4.5 ordinary credits.
6. 'Educational sociology' in the Nursery Education Diploma; 4.5 conventional credits in the first term, to two groups.

The portfolio was used experimentally on the subject modules 'New Technologies applied to Education' and 'Sociology of Education' as part of the 'Specialist Teaching Diploma in Nursery Education', the number of students being 120. We worked on the basis of formative evaluation with the university students. The process is contrastive in a single specialist area, looking at subject modules and different university teaching areas but with shared objectives, opening the way to studying their possible transference to other university subject areas and qualifications.

V.2 STATEMENT OF EDUCATIONAL PHILOSOPHY
When setting up a model that encompasses the profile of the desired teacher, and which reflects the very best of human beings in keeping with the needs of society, teaching actions need to be linked to the educative purpose, in accordance with the desired outcome.

The desired outcome is to have students that are able to learn autonomously and cooperatively, that wish to learn and to know more, who have the ability to recognise and to express their learning needs and the capacity to select and to use the best available resources to satisfy such needs.

We believe that it is necessary to teach our students their profession, because they will only ever learn their profession, if we focus their training on the essential aspects of their professional work within their studies, as well as teaching them the good practice discovered by their predecessors, and, especially, if we focus on those skills and tasks that they will have to use in their future professional life: on the one hand, the search, retrieval and assimilation of bibliographic information and, on the other, oral and written communication of results in the learning process.

As a consequence, the new educational model is centred on the student, on self-study skills and autonomous learning, on learning to learn, and on life-long learning. The learning outcomes are the acquired competencies, for which purpose change has to be brought about in the organisation of learning (modular systems and multidisciplinary curricular areas) and the systematic implementation of the use of information technologies and communication.

V.3 EDUCATIONAL METHODOLOGY STRATEGIES OBJECTIVES

The operational structure is based on the collaborative work of the university teaching staff of both an interdisciplinary nature and within a single discipline, creating spaces for analysis and reflection in ongoing seminars. The correction and adjustment and the adaptation of the relevant course programmes are carried out within them, such that they are adapted to the needs of the university and the social changes that they are expected to undertake with respect to the new qualifications in European convergence.

They centre on improving learning processes and use various strategies that encourage student involvement in the learning process and in the development of autonomous and collaborative work. Thus, the acquisition of greater levels of learning, and skills are supported as well as basic skills for professional life. The methods are participative lectures, self-study periods, and cooperative group work.

The objectives that we have set ourselves are:

— To improve academic results

— To improve institutional evaluations of teaching
— To plan student workloads both within and outside of the classroom
— To increase the summative and formative value of continuous evaluation
— To diversify the teaching methodology used

Teaching action in university classrooms (methodological process):

1. We will present the programme of the subject modules taught on the qualification on the first day of term.
2. We will promote discussion on the programme at the start of the term.
3. We will provide tutorial timetables setting out consultation times.
4. We will comply with the set timetables for the course
5. We will be available during the timetabled tutorials
6. We will prepare classes in good time
7. We will comply with the development of the terms in accordance with the programme for the subject module
8. We will promote awareness of the reality of the university course they are following.
9. We will attempt to show mastery of the subjects that are dealt with.
10 We will provide up-to-date information and ideas
11. We will link up the subjects covered at a theoretical level to professional realities, when the subject matter allows it.
12. We will use examples related to their professional future, when the subject matter allows it
13. We will clarify doubts that are expressed by our students.
14. We will try to use appropriate methodology for the development of the subject matter
15. We will use appropriate didactic resources for the subject matter that is covered.
16. We will attend to students when reviewing their exams
17. As the term progresses along with the subject matter, we will stop to think whether student attitudes towards the materials may be defined by one of the following suppositions:
    — At the start the student expressed an interest and then lost it.
    — At the start the student expressed no interest and still fails to express any interest

- At the start the student expressed no interest and now the student does express interest.
- At the start the student expressed interest and the student remains interested.
- At the start the student expressed interest and that interest has increased

18. In the development of the subject matter, we will evaluate whether we achieved an appropriate balance between theory and practice.
19. We will maintain an interest as to why students acquire a good understanding of the subject matter.
20. We will try to express the contents with clarity.
21. We will work transversally on questions of principles, ethics, values and responsibility in the different contents of the subject.
22. We will try to maintain the attention of the group.
23. We will stimulate participation among the students.
24. We will stimulate students so that they develop their own criteria in response to didactic problem-situation exercises in their profession.
25. We will take pleasure in imparting lessons.
26. We will be accessible so that students may consult us.
27. We will respond when asked questions in the classroom.
28. We will maintain good relations with the group of students.
29. We will respect students as people.
30. We will accept criticism from students.
31. We will draw up assessment criteria and tests in accordance with the subject matter presented in the classroom.
32. We will formulate clear questions in the tests that are set.
33. We will explain the valuations and qualifications obtained by our students in good time and due form.

V.4 HOW WE EVALUATE

We understand evaluation within the educational process as a good opportunity to boost student learning processes and to improve on teaching actions. This type of evaluation facilitates metaevaluation, which is to say, feedback on the process for a better quality of learning.

We shall strive to ensure our students acquire autonomous learning skills because of their close relation to the process of permanent ongoing training and life-long learning.

The assessment criteria that we will take into account are:

— Scientific approach to oral and written presentations
— Relevance to the topic under evaluation
— Student participation in the classroom
— Group work undertaken within and outside the classroom
— Knowledge of the subject matter
— Obligatory practical assignments and its presentation and defence.

To that end we prepare activities that serve as indicators of student learning outcomes:

— Questionnaires at the start and at the end of a module that can be self-corrected.
— Classroom exercises in pairs
— Analytical tasks, individual and group selection and assessment of texts.
— Exchange of ideas and opinions through debate
— Oral presentations of research work in small groups.
— Final exam
— Continuous and summative assessment that forms part of the global mark.

V.5 SUBJECT PROGRAMME: NEW TECHNOLOGIES APPLIED TO EDUCATION

The structural content of the subject is divided into three blocks and each block is made up of a series of topics:

I. **Conceptual Framework**
    1. New technologies, education and society
    2. New technologies applied to Education and Educational Technologies.
    3. ICTs in the framework of the Educational System
II. **An approach to ICT and methods: technological resources from the standpoint of the curriculum, teaching and learning**
    1. Telematic and information technology applications. Educational uses.
    2. Audiovisual mediums: characteristics and educative uses.
III. **Analysis, selection, design and evaluation of resources and technologies for Nursery Education.**

V.6 COLLEGIAL EVALUATION

On the basis of the valuable contributions made by colleagues working in similar fields, as well as those from other teachers that had participated in the seminars at which we had presented our experiences, we concluded that it would be very beneficial for our future portfolio to continue to rely on the views and contributions of our colleagues, in this case, from our own areas of specialism, so as to evaluate the teaching portfolio that we were assembling. The colleagues that we have chosen as evaluators of our work conduct their teaching activities in similar areas to ours, teaching the same type of qualification, and in many cases, sharing the same students. Their evaluatory activity centres on reviewing the declaration of our teaching philosophy (the same one that we had distributed to our students at the start of the course), materials brought to the classroom in which goals and objectives were included, as well as ongoing viewing of the digital platform that we had used for this material. The result of this experience is highly motivating for us, learning and improving the contributions that are systematically provided by our colleagues.

V.7 CONTRIBUTIONS MADE AT CONGRESSES AND SYMPOSIUMS
DEDICATED TO UNIVERSITY TEACHING

Over recent years, prior to the preparation of our teaching portfolio, there have been various opportunities that we have had to present our vision on the teaching model to the university community, which, although in very gradual way, we have been developing in the classroom. To that end, and with the objective of contrasting our initial teaching philosophy, as well as the material that we were developing, we have attended different seminars and symposiums related to teaching abilities, the goals to be developed by students etc. at which we have made clear presentations of the goals to be reached in the classroom, the educational methodology, evaluation methods etc. The majority of the opportunities were offered by our own university through the organization of different seminars carried out at the Faculty of Education over recent years. These meetings have been used as a platform to make our experience known, to share ideas with teaching personnel from other universities, and with our own colleagues, and also to recast some of the initial proposals, which once compared no longer appeared to be most appropriate.

V.8 PARTICIPATION IN TRAINING ACTIONS

During the preparation of our teaching portfolio, there have been numerous training activities in which both teachers have participated, which together amount to over 300 study hours. These activities may be grouped into three types of training actions according to their nature and their objectives:

A first group of training activities was to be directed at expanding teachers' knowledge of the context of European higher education. A type of training in which theoretical assumptions have been combined with the practical experiences of teachers from other Spanish universities that had already put this model into practice, who contributed their difficulties, suggestions etc. Adapted to our type of studies, we have furthermore followed courses linked to changes in teaching practice within the EHEA, in the course of studies leading to the Teaching Diploma in Nursery Education, centred on the design of new online subject modules and trying to manage virtual collaborative environments from this perspective.

A second group of activities has centred on improving classroom teaching, beginning with the assumptions relating to the development of social skills, modifying and improving on the types of student evaluation, as well as improving the teaching skills of university teachers.

The third and final block is linked to the application of new technologies in teaching. Training activities within this group have been directed at the preparation and management of digital material, the integration of electronic information resources for students, etc.

V.9 PRINCIPAL OUTCOMES

As the academic year is now drawing to an close, we are able to notice that the outcomes show how since the digital teaching portfolio has been set up, students have become more motivated in the learning processes of the subject module and, as a consequence, involve themselves actively in the different proposed activities. Moreover, on the basis of this methodology, a greater number of students were involved in the day-to-day follow up of the subject module. If we subject these perceptions to a "traditional" evaluation system, this translates into a greater number of people that have continued learning the subject up until the end, as well as a greater percentage of passes with respect to the previous year.

Thus, as reflected in the different studies, in comparison with competitive and individualistic efforts, it appears to have been demonstrated that

cooperation between students (when preparing work together, making their presentations etc.) tends to result in higher levels of involvement, greater long-term retention of what has been learnt (an aspect that continually crops up in the student surveys), as well as a stronger will to carry out more complex tasks, a greater facility to transfer learning from one situation to another and greater time commitments to any one task.

V.10 FUTURE PLANS

With regard to the results obtained from having put our teaching portfolio into practice, various future challenges arise over how to improve the educational methods and student learning outcomes within the taught subjects. This process, nevertheless, will continue to move us along the same lines of work that we have been doing up until now, that is, directing our effects toward the preparation of teaching portfolio whose quality increases over the following courses. Thus, one of our first objectives in the very near future will be to improve the academic results of students, who within the evaluation systems that have been set up, are able to improve and demonstrate that learning has taken place over the academic year in the proposed subjects.

To do so, as we explained in the section on evaluations, we have assumed a commitment to continue improving our evaluatory capacity, increasingly moving away from final results obtained by the students to centre on process-based evaluation that values the work that the student undertakes on a progressive basis and not simply the end result.

On the other hand, in relation to the teaching methodology that is employed, although our working methods are very satisfactorily rated (and also positively appraised by the students), it appears appropriate to continue innovating in the area of teaching methodologies, committing ourselves to continue our training whenever possible within the same subject matter by attending symposiums, congresses etc. that focus on this topic.

Ending with this section, we will set out and develop a set of concrete actions that are already planned for the next academic year:

a) Preparation of a "Learning Guide" for, at least, one of the subject modules that we teach in order to set out in a clear way the final, and the

intermediary objectives of the module, the expected outcomes, as well as the teaching methodology that will be used.

b) Design of a self-evaluation teaching plan that will serve to collect specific and appropriate information on the experience of the teaching innovations. This evaluation system will serve as a guide not only for the teacher, but for the students, who before embarking on the module will clearly understand the parameters through which they will be evaluated.

c) Prepare an electronic version of the teaching folder that can be incorporated onto the web site of the subject module within the digital platform of the University.

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ePORTFOLIOS
AND eARGUMENTATION

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INTRODUCTION

It is commonly perceived that students who work in environments involving Information and Communication Technologies (ICT) invest differently in solving learning tasks, since these environments promote relevant progress in the conceptual changes of learning and of educational innovation.

In distance learning and in web-based environments, online identities are created through text and its authorship, and most interactions happen in written form.

Creating learning objects like ePortfolios is a task that demands involvement and reflexion. So it consists on more factors to expose one's skills and capacities and to give greater visibility to the author's work.

The success of ePortfolios also depends on the interaction between the author and the tutor and/or his/her peers. This interaction is considered as one of the more interesting and important factors of improving skills and knowledge because the outcomes are related, on one hand, with the best performances of the "ePortfolio author" and, on the other, the difficulties s/he shows are detected and viewed by the tutor that can guide her/him in this learning process.

ARGUMENTATIVE SKILLS

Nowadays, considering the global society and multiculturalism, the ability to argue should be developed to achieve better dialogue between people of all countries.

Arguing is very important, since students and all people need to be able to make themselves clear, justify, discuss, and defend their own ideas. Besides, it is very important for the learning process because according to the literature argumentative skills help students develop and structure their knowledge in a more sustainable way.

Activities aimed at working on argumentative texts, suggested in several textbooks, often show a simplistic, linear and reductive conception of such texts, with consequences for teaching and learning. What's more, they are introduced and trained too late in the schooling process.

Discourse activity is limited mostly to understanding and producing narrative or descriptive texts, since argumentative texts are considered too complex for students.

Argumentation has, in fact, specific structures and characteristics that differ from other types of discourse. It is based on a mechanism of persuasion that aims at convincing someone or changing one's opinion to reach consensus. One of the fundamental questions of this type of discourse is giving the speakers the useful tools (abilities) for solving conflicts between contradictory statements.

The dialogic dimension of argumentative discourse is more easily understood if one sees argumentation as defending personal points of view, as mutually understanding, refuting, changing, extending and improving a group of arguments and counter-arguments, between two or more issues, aiming at resolving tension or a conflict resulting from a problem-situation, considering a particular context and target reader.

Choosing a pedagogy based on negotiation and collaboration, it is undoubtedly important for teaching in general and especially — due to the argumentation dialectic character — for optimizing students' argumentative skills.

Writing (negotiating and arguing in the academic context), or academic writing, refers to facts or speculations that logically support one new idea or evidence. However, it is also persuasive, because convincing arguments must support it.

Academic writing is very demanding. Studies show that teachers, in general, are not providing their students with academic writing skills, and that they are not very specific about their demands.

This is the same as saying that arguing requires very demanding and complex cognitive skills like questioning, interpreting, judging, self evaluation (reflecting), and also to find one's own strategies for solving problems, memorizing, and learning how to learn.

It requires critical thinking, due to the fact that it is a set of ideas which teaches to think and to learn. Critical thinking consists of examining ideas, detecting arguments, and analyzing arguments such as sub-skills of analysis—, among other abilities like interpreting, analysing, evaluating and inferring, as well as taking into consideration evidence concepts, methods or contexts on which judgement/thought is based.

ONLINE LEARNING

As this text concerns ePortfolios and eArgumentation, a brief approach to eLearning is necessary, in this context. It is knew that, for some students, ICT may be and may become better cognitive partners for advanced problem solving functions if compared to the notebook and the pencil.

Literature about online learning communities and online interactions is abundant. It is true that eLearning and blended learning have proved their potential and for a lot of students it is a good alternative to traditional learning activities, depending on the students' learning styles. This function is as important as encouraging students to discover knowledge virtualisation and its actualisation dynamics.

As a mater of fact lots of studies show that online activities have positively influenced students' attitudes towards their own writing and argumentative capacities. Such activities have also contributed towards their awareness of ICT complexity.

However, efficient online performance does not necessarily correspond to efficient offline performance. Recent studies also show that students with well organized argumentative reasoning, and with a strong capacity of initiative and complex contributions, exhibit a poor offline performance. A positive attitude towards online tools and a solid familiarity with them are decisive factors for success online (Pinho, 2008; Loureiro, 2007).

Studies of this nature constitute a contribution towards validating online collaboration and learning strategies and an increased knowledge about the development of reflexive and written skills in web based environments and their contribution to the construction of knowledge. Finally they constitute a starting point for future research in these areas: (i) analysing the importance of learning strategies and tools created online for the development of

reflective skills; (ii) examining the contribution of guided online interaction with advanced tools; (iii) determining the influence of the online development of critical thinking skills on academic writing and ePortfolio construction.

ePORTFOLIOS

ePortfolios are a learning tool and strategy that are strongly based on three competences: writing skills, reflexive skills and self evaluation skills. Thus, the connection of ePortfolios with the previously mentioned statements about arguing and critical thinking is, nowadays, in the educational and life long learning context, evident.

In the construction of ePortfolios learning becomes more comparable, visible, portable and transparent (if we consider the 4 principles of the implementation of the Bologna process). The ePortfolio accompanies the student and future professional wherever s/he goes and it facilitates the emergence and visibility of an European citizen.

The ePortfolio evolves around 4 different axes: (i) personification/uniqueness; (ii) reflection; (iii) progression; and (iv) sharing. As a mater of fact, ePortfolios can positively influence teaching, learning and evaluation and can create a new concept of the classroom: a place where learning is constructed according to the individual rhythm of each student witch includes valuing reflective thought, experience, intuition, and the knowledge of each individual and the belief that difficulties can be overcome.

Therefore learning must be seen differently. It is a process where teaching and learning actors must possess other skills. The teacher is not there only to judge, but principally to help, to guide the learning process.

The best capacities of the student are elevated and s/he receives good feedback on them, so s/he becomes more able to overcome his/her difficulties and fragilities and is therefore motivated to move forward.

Considering those principles the ePortfolio becomes a reflexive narrative that gives each learner a voice in a way that implicates the learner in the process and in the multiple interactions between teaching and learning. This process is always unfinished and intentional. The learners interact with contents and identify their own learning strategies, giving them meaning.

It is a continuous process and the relationship between teaching and learning (teacher/learner) becomes more equal and democratic. Feedback is timely and the "areas of non-knowledge", in Sá-Chaves' words, become salient but without the stigma of the negative notion of the repressed "unlearned", negatively judged by the traditional school (2004).

It is not hyperbolic to say that both teacher and learner, at some point, change roles. The teacher is now the tutor, the moderator and the facilitator and the student is the meta-cognitive reflexive learner, able to make decisions about his/her own learning and way of learning, a pro-active intervener.

The new attitude of the teacher has an impact on learning. In this relationship that includes multiple facets due to the interaction with teacher, peers and learning itself, the student becomes an active participant in his/her own learning, making meta-cognitive decisions about the whole process.

The teacher as counsellor, as an advisor and mediator has never had more meaning than now. The end of training can evidence the process of learning evidenced by a new deep and amplified knowledge and a gradual, progressive, intentional and supported process from the scientific point of view.

CONCLUSIONS

In a process of this nature, that has a strong connection between both the meaning and the characteristics of learning change, the tasks developed by learners have other implications.

As far as research is concerned, it is important to construct new narratives using the narratives of students, Novel readings render new insights into these narratives, taking into consideration that uniqueness and sharing, interaction and reflection, are both important in the construction of a more pro-active student working *online* and *offline*, interactively and reflexively, individually and collaboratively.

Web 2.0 tools can be useful to reinforce learning through mechanisms based on the concept of collective intelligence. This web of social interaction and content production promotes the new concept of collective intelligence that is of the utmost importance for the development of one's learning.

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DIGITAL PORTFOLIO AS A STRATEGY TOWARDS TEACHERS' PROFESSIONAL DEVELOPMENT

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The Project "Digital Portfolio as a strategy towards teachers' Professional development" started in 2005 within the framework of Comenius 2.1 Action, under the European Union Socrates Programme. It included eight partner institutions from five different European countries — Belgian, Czech Republic, Finland, The Netherlands and Portugal.

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

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 evidences and guide long term professional development and are recognised as a reflexive and proactive means to achieve a global of one's learning path with the advantage of increasing students' skills and competences in the use of ICT.

DIGIFOLIO

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 being included in educational policy of many countries, even though it is given different levels of importance and usage.

The recognition of the importance of the e-portfolio, in the above mentioned areas, was the starting point for the work undertaken by a European partnership supported by the European Commission, under the frame of a Comenius action — *"Digital Portfolio as a strategy for teachers' professional development"*. This project included eight teachers training institutions from five countries.

Nowadays most 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, a well known expert in the subject of e-portfolios and e-learning, their main advantages are related to some of the following aspects: high storage capacity, portability, constant updating possibility, learner centred teaching which 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.

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.

Valuing the importance of ICT in education, the European Commission has set out common European principles for teacher competences and qualifications in 2005, among which this area 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 all daily activities. On the contrary, it should reflect and take in the social advancements.

The following tips may be of help to teachers and students in the process of portfolio building.

A DIGITAL PORTFOLIO

WHAT CAN IT BE?
It is an organised set of evidences that portray the personal or professional path of the individual or of an organisation. In this sense evidences can be regarded as all the records that document actions which can be displayed in many different formats (scripto, video, imago, audio, etc).

Besides the process of selecting and organizing materials, the portfolio must include a continuous reflection on the process, f.i. by means of identifying the successes and difficulties.

WHAT IS THE USE OF A DIGITAL PORTFOLIO?
It may have several different usages depending upon the final goal one wants to achieve. However, it is always associated with the need to show what one can do, either from the personal perspective, where the portfolio mirrors its author, or from the personal skills and competences validation demanded by external factors, such as professional assessment.

WHAT SHOULD BE COMPRISED IN A DIGITAL PORTFOLIO?
A portfolio is made of a set of organised materials and reflections around a process or a personal or professional development project. Different objectives lead to different kind of portfolios. For example, when we think about a personal or professional development portfolio we expect to find the underlying learning goals.

A portfolio is not a file where we keep all the documents associated to a specific process but rather a selection of the significant ones that help to achieve the prior defined objectives. The reasons for this selection must be part of the individual reflection which sustains the choice of each and every evidence.

WHY TO CHOOSE THE DIGITAL PORTFOLIO STRATEGY?
A portfolio can be an essential tool for the personal and professional development once it provides self-knowledge in the following dimensions:

— Who am I?
— How am I?
— What can I do?
— What are my limits/difficulties?
— Which are my ambitions/goals?
— What path to walk?

HOW TO BUILD A DIGITAL PORTFOLIO?
Portfolios have been used for centuries in traditional layout. However, the recent adoption of digital format, made possible by the technological

development, provides a large number of advantages mainly related to the easiness in updating and dissemination of the information. The storage capacity and multimedia integration meet the end of today's professional demands.

A digital portfolio (or e-portfolio) includes digital documents and stored files in one or more folders. The organizing body of the portfolio is rooted in a branch of hyperlinks which relate the competences to the evidences and reflections. These, in turn, depicture the whole process.

Some of the essential features of a digital portfolio may be the ones listed below:

— Restricted access
— Safe storage for files and evidences
— Helping tools in the building end editing of organising documents and reflections related to the evidences
— Interaction possibility

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DIGITAL PORTFOLIO

A STRATEGY FOR TEACHERS' PROFESSIONAL DEVELOPMENT

LESSONS LEARNED FROM AN INTERNATIONAL COURSE

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INTRODUCTION

During a contact seminar in Dublin (2004), several representatives of European institutions for higher education and training — APS (Associação de Professores de Sintra) (PT), The Hague University of Professional Education (NL), Turku School of Economics and Business Administration (FI), University of Helsinki (FI), VCLB-Organisation (BE), Katholieke Hogeschool Limburg (BE), St. John's College (Teacher Training College and Centre for Ecological Research & Education) (CZ) and the Psychology-faculty of the Lisbonne University (PT) — realised that teachers, lecturers and trainers have an urgent need for practical training in the use of e-portfolios. This resulted in an approved Comenius 2.1-project Digifolio, Digital Portfolio, as a strategy for teacher's professional development (2005).

THE DIGIFOLIO PROJECT

The consortium aims to develop materials that will help teachers all over Europe to integrate the new approaches in their own education and training practice, by learning by doing or by means of active learning. In the project the various elements are studied of how to realise the portfolio as a meaningful learning strategy. Then there are the necessary elements to set up a meaningful overall learning strategy by using digital portfolio, such as the development of specific teaching and learning strategies, digital didactics, learning assessment and learner's assessment, the teacher's own professional development and ICT-potential. This may be illustrated in the following figure:
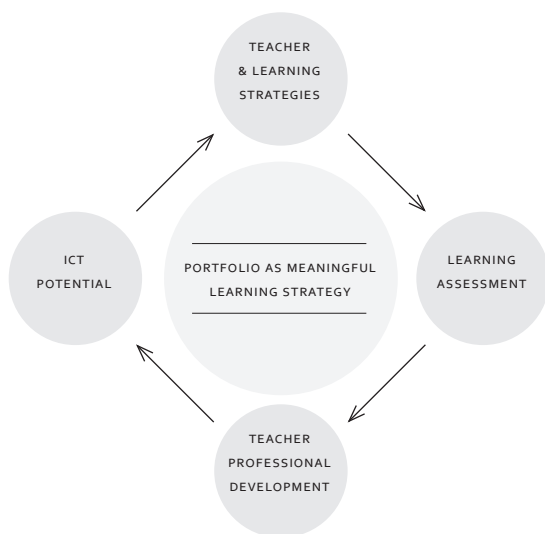
Figure 1. *Elements of a portfolio as meaningful learning strategy* (Costa, 2006).

So the main objective of the digifolio project is to use the educational possibilities of portfolios supported by ICT and give them a place in the teacher's professional development. This, as a consequence, will lead to the writing of new competence profiles, and the development of new approaches in the teaching and learning methodologies in order to achieve these competences.

Accordingly, there will be a shift in the teacher's role since the focus will be on student centred rather than teacher centred learning environments, with the subsequent increase of student responsibilities and motivation, giving empowerment to the student to manage the own learning experience.

The project also brings to light that European higher education faces the same educational changes, both in the 'old' and 'new' Europe, in the north as well as the south. The concept of the e-portfolio is known everywhere, and the need how to learn from it and how to integrate the eportfolio in education systems is a major challenge for European education institutions everywhere. As is the matter how to motivate the teachers. This is confirmed in what was earlier researched and reported: the new ways of teaching and learning are very demanding, because the teachers have no or very little experience in this field

and more often than not are they unable to reflect on their own often outdated training (Peters, 2000). Therefore this Comenius project does not only focus on theoretical elements alone, such as developing a common knowledge database on the theory of portfolio usage based on research. The main objective will rather address the practical training issues that matter right now, in 2007. The objective is to guide and counsel European teachers to develop an own e-portfolio, an activity which may serve as the basis and the inspiration for an applied learning strategy to further their own professional growth. A specific objective is that the teachers will experience both the benefits and the difficulties their own students experience when using an e-portfolio and PPDP.

Meanwhile one of the most important outcomes of the project, namely the organisation of an international course to learn teachers to develop and maintain a digital portfolio to underbuilt their professional development took place in Albufeira (P) in April 2007, with 19 participants from Belgium, Finland, Germany, Italy, Latvia, Portugal, Sweden and Turkey.

One of the objectives of the course was also to help participants to build out an e-portfolio that will be maintained until may 2008. In May 2008, participants will have the possibility to meet eachother again in Helsinki and present the results of working and learning one year with an eportfolio.

So not only the product — the e-portfolio — on its own, but more important the process of working and learning with an e-portfolio is an objective.

THE MAIN PARTS OF THE COURSE WERE

INTRODUCTION INTO NEW ICT-TECHNOLOGIES
The participants have had an introduction into the new ICT-technologies. WEB 2.0 was one of the new technologies. WEB 2.0 refers to a perceived second generation of web-based communities and hosted services, such as social--networking sites and wikis, which aim to facilitate collaboration and sharing between users. Although the term suggest a new version of the World Wide Web, it does not refer to an update to Web technical specifications, but to changes in the ways software developers and end-users use the web as a platform. "Web 2.0 is the business revolution in the computer industry caused by the move to the internet as platform and an attempt to understand the rules for success on that new platform" (Tim O'Reilly).

The participants have made their own personal environment on the internet. An other name is a web desktop or webtop. This is a network application system for integrating web applications into a web based work space. It's a virtual desktop on the web, running in a web browser as software.

They used Netvibes to make their own environment. Netvibes is a multi-lingual Ajax-based personalized startpage. It is organized into tabs, with each tab containing user-defined modules.

Built-in Netvibes modules include as RSS/Atom feed reader, a calendar, bookmarks, notes, to-do lists, multiple searches, support for POP3, IMAP4 email as well as several webmail provides (Gmail, Yahoo Mail and Hotmail), Web storage, del.icio.us, Meebo, Flickr photos, podcast support with a built in audio player and several others. A page can be personalized further through the use of one of many existing themes or users can create their own theme with a wallpaper of their choosing. Customized tabs, feeds and modules can be shared with others individually or via Netvibes Ecosystem.

Another ICT-technologies that have been studied was Wiki. Wiki is a collaborative website which can be directly edited by anyone with access to it. Ward Cunningham, developer of the first wiki 'WikiWikiWeb', originally described it as "the simplest online database that could possibly work". One of the best-known wikis is Wikipedia.

DEVELOPMENT OF AN E-PORTFOLIO, INCLUDING A PPDP

After the introduction of the new ICT-technologies the participants have made their Personal and Professional Development Plan. A Personal Development Plan refers to the creation of an action based on a reflection of your personal, career and academic objectives. By means of the PDP the employee can formulate his objectives step by step and afterwards he can define the following elements:

the competence to develop,
the type of development activities,
the specific situations in which will be practised,
the required appliances,
the deadlines/ the planning.

The PDP simplifies the formulation of SMART (Specific, measurable, ambitious, realistic, in time defined) objectives and thus contributes to a more objective annual evaluation.

Once the objectives have been defined, the PDP can also be used as a succession tool: each employee can see, as it happens, where he stands in the development of its competences (selfevaluate).

WORKSHOP ON COLLECTING AND EDITING VIDEO EVIDENCES

Central in this workshop 3 questions appeared. The first question was 'Why use video for professional development?'. The second question 'How to use videos for professional development?'. The last question 'How to edit videos?'. The answer on question one, with the help of video we don't need to recreate the situation mentally but watch it. Video allows us to view our own professional practice from a new angle, which naturally creates reactions, opinions and reflection.

The answer on question two, there are at least three types of usage for video in teacher professional development:

— 'Descriptive' use: video as a documentary and representational tool of the progress of professional development.
— 'Reflective' use: video as a 'mirror' in self-reflection or as an object in reflection on others
— 'Constructive' use: video as a tool for creative active learning by doing and reflecting.

The answer on the last question, the participants have studied some examples of video editing.

WORKSHOP ON NETWORK BUILDING AND E-COLLABORATION

In this workshop the participants have tried out several Network Building and eCollaborating tools. Elgg, moodle, eduspaces, slideshare are examples of the tools. A social network service focuses on the building and verifying of online social networks for communities of people who share interests and activities, or who are interested in exploring the interests and activities of others, and which necessitates the use of software. Most social network services are primarily web based and provide a collection of various ways for users to interact,

such as chat, messaging, email, video, voice chat, file sharing, blogging, discussions groups, and so on.

ASSESSMENT

Self-assessment is a way to involve students more with their own learning process. The students evaluate their own learning process and their end products such as theses. An example of selfassessment is the strength-weakness--analysis or a personal development plan (PDP).

Peer-assessment is a process where the students assess other students (peers). There are several forms of peer-assessment, peer-ranking, peer--nomination and peer-rating. Peer-ranking is arranging students of the best to poor performing on certain competences. Peer-nomination appoints a student as the group member whom it the bests have done within a group on certain points. Peer-rating is about assessing each group member by means of a number of competences.

Co-assessment (peer-assessment in combination with an appraisal by the lecturer) is a way of assessment which more and more is used at for example the appraisal of group work and skills.

At co-assessment students have the occasion of assessing each other but the end judgement is pronounced by the lecturer.

RESISTANCE AND COMMUNICATION

Resistance has always been coupled to renewal. People must try to handle with it. An other way of resistance is that people don't have the technical know how to make an e-portfolio. There are so many tools to make an e-portfolio but you must have some basic ICT-skills and also the knowledge of new ICT--technology to work with these tools.

CONCLUSION

Main conclusions of the one week formation were that teachers have sufficient basic ICT-skills to work with ICT (computer, wordprocessing, using internet & e-mail). However it was noticed that the knowledge of new ICT--technologies as e.g. WEB 2.0 applications were not sufficiently known for the purpose of using these technologies to develop and maintain the e-portfolio

and its content. The concept of a personal and professional development plan was rather new for the participants. This learned us that the concept of an e-portfolio as a map for gathering information and results was well known, but not the strategy to learn out of the gathered elements of the e-portfolio. Also the workshop about video-editing learned us that teachers have good basic ICT-skills, but mainly oriented to wordprocessing. One of the conclusions after this training week was that e-portfolio's will be filled mainly by texts. This won't have to be a problem, but makes the e-portfolio-content rather poor. ICT as multimedia-tool gives just an extra possibility to collect other than written materials. Also the workshop on collaboration and networking showed us that participants know the internet, and how to use it, but e.g. are not aware of applications as slide-share, netvibes, eduspaces, elgg, zoho, del.icio.us, blogs... what has a rather negative effect on the cooperation between teachers on how to develop and how to learn from eachother, what is just motivated by the socio-constructivistic learning theory and asked from students.

Although the digifolio-project has still one year to go, some advices to increase an efficient use of e-portfolios for teachers, and as a consequence also for teachers in relation to their students, can already be formulated:

— don't focus too much on the e-portfolio itself, but focus mainly and the PPDP.
— assessment can be one goal of using an e-portfolio, but using the e-portfolio as a learning strategy is also very important.
— Teachers-ICT-skills are good till very good, but an efficient e-portfolio can contain more than text. Think about ICT-formations for teachers as video--editing, presentations...
— introduce WEB 2.0-applications, because they can offer teachers the necessary tools for collaboration and learning from each other.

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ANALYSING ICT TOOLS
FOR PORTFOLIO EDUCATIONAL GOALS

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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 such as social software and Web 2.0 technologies allow experiencing new organizational 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 development. In what teachers are concerned the use of portfolios can become a powerful means helping the change of the educational practices (Cardoso, Peixoto, Serrano & Moreira, 1996) if it is adopted as a meta cognitive and reflective strategy about teaching about them (Galvão, 2005). However there is a lack of information about what digital 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 paper especially aims at helping teachers in that process, providing an analysis and evaluation technologies grid based on their pedagogical potentialities for the development 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 "*The* d*evelopment strategy*" a special attention is given to the most significant moments of the process, i.e., the identification of the portfolios objectives as well as the identification of the possible analysis categories. In the last part — *"The analysis and evaluation grid"*—,

the concrete proposal we came up to is presented, resulting from the reflection made during the previous stages.

This chapter is a reduced version of the text first published by the Digifolio project in the book *Digital portfolio as a strategy for teachers' professional development* (Associação de Professores de Sintra, 2006).

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.

THE 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 two different phases or moments: i) identification of portfolios objectives; and ii) identification of possible categories of analysis.

I) 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 & Miranda (2003); Coelho (2000 *cit. In* Bernardes & Miranda, 2003); Paulson & 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 port-folios 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.

EDUCATIONAL PORTFOLIOS OBJECTIVES	FOCUS
To promote the reflexive thinking To evidence the self-reflection process	Reflection
To structure the procedures of teaching and learning To collect information in a structured and personalised way	Structure
To stimulate communication among al the intervenient in the educational process To develop interactive and collaborative processes	Communication
To promote student's autonomy in the learning management To commit students in the learning process	Motivation

To facilitate the student's participation in the contents selection
  and in the evaluation criteria
To negotiate the choice of the content to be included according
  to the established criteria between teacher and student
	Decision

To register the procedures and document the learning process To exhibit the works that can evidence the acquisitions	Visualization

To involve actively all the participants in the learning process
  and in their evaluation
To provide new teaching ways and participated
  and productive learning environments
	Participation

To show evidence of the effort and progress in the knowledge
  and competences acquisition process
To enhance the process of personal integration of knowledge
  the acquired during the theoretical and practical training.
	Evolution

Table 1. *Objectives related to the development of portfolios and their focus*

II) CATEGORIES OF ANALYSIS

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 systematization 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 Figure 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.
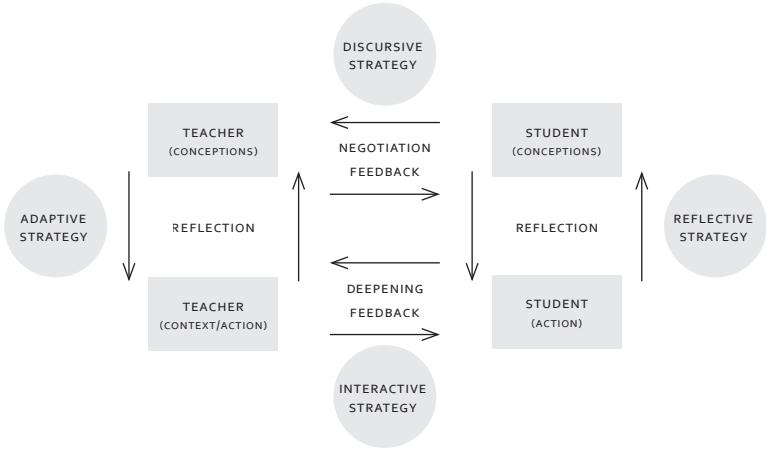
Figure 1. *Learning and teaching strategies*
(Adapted from Laurillard, 1993).

Those are, in fact the strategies we took as reference to analyze 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. 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.

Reflective 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.

THE ANALYSIS GRID

According with the initial purpose the present proposal of an "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, on the next page, it is an analysis grid structured around four considered axes (strategies), the intended reflection on each of them (objectives) and the possibilities of the piece of the analysed technology.

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

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

Table 2. *Analysis and evaluation proposal of ICT educational and pedagogical potentialities related to the type of strategies and specific objectives of portfolios development*

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. We expect it may contribute to a deeper knowledge on how technology may help thinking in the school.

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ePEARL

CHAPTER 8

SUPPORTING LEARNING USING ELECTRONIC PORTFOLIOS

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What are electronic portfolios? And why should you consider using one in your classroom? How do they help students learn? What is ePEARL and how can it be used for teaching and learning? These are a few of the questions we wish to address in this article so that teachers and administrators can make informed decisions about using this form of technology to help create and maintain successful student-centred classrooms.

ABOUT PORTFOLIOS

A portfolio is a purposeful collection of student work that tells the story of a student's effort, progress and/or achievement in one or more areas (Arter and Spandel, 1992; MacIsaac and Jackson, 1994). Danielson and Abrutyn (1997) identified three main types of portfolios: working, showcase, and assessment. Working (also known as "process" or "learning") portfolios contain works in progress, track student learning over time, and may be temporary because students move on to either an assessment or showcase portfolio. Showcase portfolios traditionally exhibit the student's best work. They are generally used to demonstrate the level of accomplishment that the student has attained. Assessment portfolios are structured and standardized with "the content of the

curriculum determining what students select for their portfolios" (Danielson and Abrutyn, 1997, p.5).

At the Centre for the Study of Learning and Performance (CSLP), we focus especially on the use of portfolios for working, process or learning purposes. We will explain how process portfolios can be used to help scaffold and support key learning processes, focusing attention on <u>how</u> students learn as well as on <u>what</u> students learn. At the same time, portfolios archive student work in ways that encourage authentic forms of assessment that may have advantages over traditional testing.

ELECTRONIC (OR DIGITAL) PORTFOLIOS

In the past, portfolios were collections of work stored in binders, file folders, or boxes. Today, computers are used as an effective tool for developing and storing portfolios given their ability to store and process large quantities of content, and because they can effectively support and guide the portfolio process. There are many advantages to using electronic portfolios. Students can easily integrate multimedia materials, allowing them to use a variety of tools to demonstrate and develop understanding. Student work becomes easy to share with peers, teachers, parents and others, and lets students and others provide feedback through a single electronic container. At the same time portfolios provide remote access for students' completion of homework or when learning at a distance, for teachers for review and assessment purposes, and for parents to improve communication.

SUPPORTING SELF REGULATION

Educators believe that portfolios allow students to think critically, and become active, independent and self-regulated learners (Perry, 1998; Mills-Courts & Amiran, 1991). Self-regulated learners are individuals who are metacognitively, motivationally, and behaviourally active participants in their own learning. Metacognition refers to the awareness, knowledge and control of cognition. The three processes that make up metacognitive self-regulation are: forethought, performance, and self-reflection. See the academic diagram below and the more simplified classroom version that illustrates this cyclical process as planning-doing-reflecting.

In the **forethought** or planning phase, students are expected to set learning goals and decide on the means to achieve these goals. In the **performance**

PERFORMANCE OR
VOLITIONAL CONTROL
*Processes wich occur during
motoric efforts and affect
attention and action*

FORETHOUGHT
*Influential processes wich
precede efforts to act and set
the stage for action*

SELF-REFLECTION
*Processes wich occur after per-
formance efforts and influence
a person's response to that
experience*
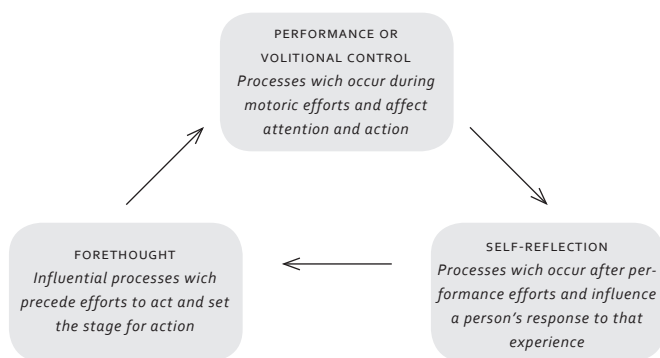
Zimmerman's (2000, 1989) Model of self regulated learning

or doing phase, students carry out planned activities carefully, actively, and intentionally to achieve these learning goals. In the **reflection** phase, students use their own and others' feedback to refine and improve goals, strategies, and activities.

By regularly engaging in these processes, responsibility for learning becomes more student-centered and students become better self-regulators of their learning. Finally, the process of planning, doing, and reflecting on their learning, enhances the quality of their learning. These are lofty goals. Does the evidence warrant such claims about electronic portfolios?

PLANNING   DOING   REFLECTING
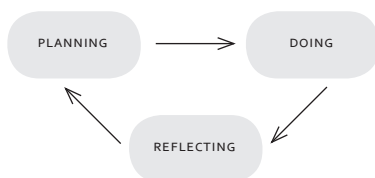
ePEARL's model

IMPACTS ON STUDENTS

At the CSLP, we believe in the importance of designing tools using the best available research and theory, refining our tools based on input from educators, consultants, administrators and students, and finally validating our tools using carefully controlled longitudinal field experiments.

Until recently, evidence on the impacts of electronic portfolios on outcomes was sparse (Barrett, 2007:Carney, 2005; Zeichner & Wray, 2001). But a yearlong non-equivalent pretest-posttest quasi-experiment conducted by Abrami et al. (in preparation) provides exciting new evidence that electronic portfolios, specifically ePEARL, can be used in ways to promote significant gains in children's literacy and SRL skills. Students who used ePEARL reported higher levels of SRL processes including: setting process goals, listing strategies, using comments from their teacher to improve, and understanding how they are being evaluated. Students also made significant gains in writing skills such as word choice and sentence structure. We expect that ePEARL will support, and our research will further illuminate, the long-term development of self-regulation. Models of self-regulation suggest important links between self-regulation and school and workplace success (Zimmerman, 2000) but less is known about its development. For example, we have already learned of the challenges encountered by teachers and their students in developing these skills so they become internalized (Meyer et al., in preparation).

THE ePEARL SOFTWARE

The CSLP is a research centre of excellence based at Concordia University in Montreal. The CSLP works actively with school boards and educational organizations to research and develop technology-based tools designed to improve student learning. Since 2000, the CSLP has worked in collaboration with our partners to develop a bilingual, web-based e-portfolio tool that may be considered as both a Process (or Learning) and Presentation portfolio allowing for authentic assessment of student learning. The most recent version entitled Electronic Portfolio Encouraging Active Reflective Learning (or ePEARL) is designed to encourage self-regulated learners (Abrami & Barrett, 2005; Wade, Abrami & Sclater, 2005).

Three levels have been designed for use in elementary and secondary schools: Level 1 is for Grades 1-2; Level 2 — Grades 3-6; and Level 3 — Secondary students. Each level builds in terms of complexity and sophistication with artifacts being carried forward from the previous level.

In all ePEARL environments, students may:

— Learn to plan and reflect on their learning meaningfully, and to comment constructively on the work of their peers.
— Track their reading and music development, or presentation skills by recording directly into the computer;
— Learn basic word processing commands through the use of a text editor;
— Obtain constructive feedback from teachers, parents and classmates for selected artifacts or on the entire portfolio;
— Archive selected artifacts within a presentation portfolio over the course of their education; and
— Save their portfolio in html format and store it on a CD or other memory device so that they may take it with them when they graduate.

Level 2: Home page

Level 1 is designed for beginning readers and writers in early elementary classes. It provides a friendly interface that offers two main features: Reading and Creations. Reading segments (90 seconds) may be recorded directly into the software. Creations may include writings, numeracy, and artistic projects. Students can type into the text editor, and add up to three attached files, such as scanned drawings or images. These features are presented within the structure of a portfolio environment as students are introduced to basic portfolio processes such as goal setting and reflection. They can also enter a Reading Response.
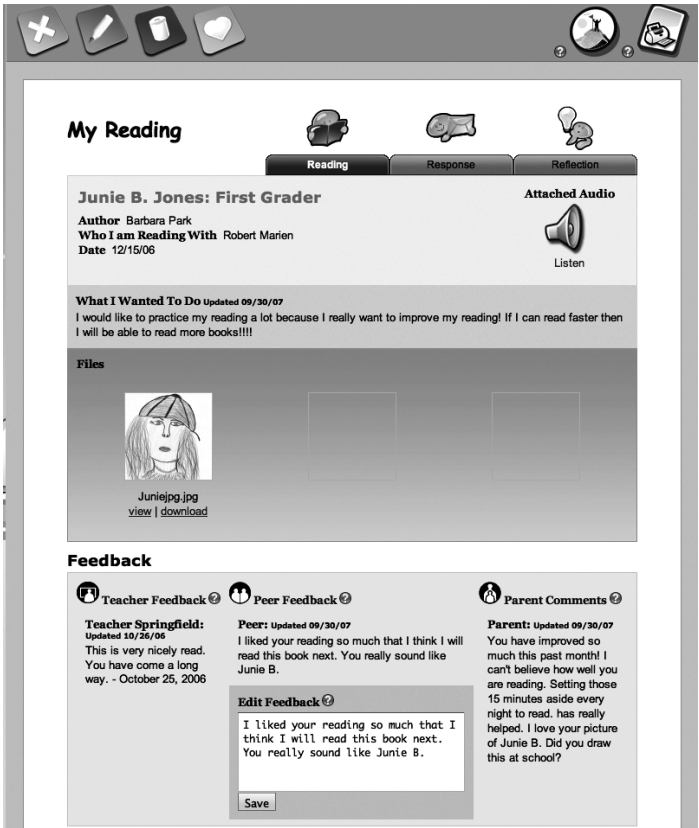
Level 1: View reading

Level 2: Designed to be used with late elementary students, Level 2 allows for additional learning opportunities. The environment supports students in the portfolio process and promotes emergent self-regulation skills. Students are guided through the work process, and may set general goals for the term, specific goals for each task along with the strategies for achieving their goals. They are encouraged to reflect on their own work, provide meaningful feedback on their peers' work, and select important artifacts for storage in their presentation portfolio.

Level 3: The design of Level 3 is very similar to that of Level 2. Currently, the only difference is that the language and the graphic interface used throughout the software, including the Help, is more mature.

Level 2: Index page for all artifacts

TEACHERS

ePEARL also offers a teacher environment in which teachers can:

— Create their own portfolios;
— Provide feedback on students' goals, work, reflections and entire portfolios;
— Track the development of their students' learning over a term or a year;
— Model effective practices related to goal setting, reflection and conferencing;
— Manage their students' accounts, such as changing the level of their portfolio; and
— Access a range of pedagogical and technical support materials on ePEARL specifically, or the portfolio process more generally.

PROFESSIONAL DEVELOPMENT

From a technical perspective, using ePEARL is rather straightforward. It was designed so that students and teachers can begin using it quickly. From a

In-context help with multimedia support and teacher tips

pedagogical perspective, however, ePEARL presents new challenges and opportunities both to teachers and students. It takes time and the development of expertise to use ePEARL effectively.

The CSLP recognizes the importance of supporting teachers as they use ePEARL with their students, hence has designed a variety of online and print-based material, training sessions, and multiple day institutes, which have been offered across Canada. For example, the centre has worked closely with pedagogical consultants from LEARN--a non-profit education organization—to offer intensive full day training sessions that provide a mixture of discussion, demonstration and opportunities for guided experimentation with the tool.

In addition to training, the CSLP has embedded help within the tool. The just-un-time multimedia support can be used for class demon-strations and discussions. Other resources include; an online teacher manual, a variety of lesson plans and job aids, and a virtual tutorial with over 40 video clips. In addition, an ePEARL wiki is hosted to promote online communities of practice.

ePEARL won't work if students do not have sufficient access to technology and so we recommend at least two hours per week of class time dedicated to it. ePEARL is not intended to be used in isolation of other student-centred activities. ePEARL is intended to be used in conjunction with other student--centred activities. Our research indicates that it is used most effectively by teachers who work in a school community that widely implements it.

CONCLUSION

The CSLP believes that our approach to research, development and dissemination--which focuses on evidence-based practice--provides opportunities for our partners, in particular, and the educational community, in general, to have active input into all phases of the ePEARL project. It will also provide them with ownership over the outcomes and genuine opportunities to reap the benefits of effective pedagogical practices.

The software may be viewed at: http://grover.concordia.ca/epearl/en/. We welcome others to use our tools, including ABRACABARA (an early literacy tool for English reading and writing) and ISIS-21 (an inquiry skills tool for teaching information literacy), which are integrated with ePEARL in the

Learning Toolkit and are available at no cost. Please contact us if you wish to become a research partner working with us on further design, development, and validation.

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USING THE DIGITAL PORTFOLIO AS SUPPORT IN EYEWITNESS SUBJECTS

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INTRODUCTION

We would like to share with you a research study carried out in Spain about how the teaching staff of 11 universities make use of the digital platforms, including educational methodology, and the type of activities and evaluation tools used.

We have divided the content of the document into three sections. In the first part we would like to emphasize the general characteristics of the research carried out, its justification and ideas that inspired it. The second part refers to the results obtained in Cadiz University. We intend to give an overview of the general use that the teaching staff make of this tool in their daily tasks. Thirdly, we would like to present in greater depth the characteristics of the teaching staff who use the digital portfolios.

CHARACTERISTICS OF THE NATIONAL RESEARCH

We go on to see the characteristics of the national research carried out. In the first place, the opportunity of Higher Education European Space is an excellent opportunity to reestablish university teaching within the framework of an education paradigm for learning. A change of approach which implies considerable methodological challenges for university teaching staff. One approach is to orientate and to organize teaching towards electronic learning (e-learning), due to its potential for independent and collaborative formation of knowledge.

Secondly, the change in current teaching and learning. Nowadays, it is not a matter of "giving a class", or "teaching" by merely "explaining" a series of subjects, but rather to orientate the learning of the students towards acquiring a diversity of skills.

Thirdly, we raised the risk of using e-learning so as not to change anything. In other words, we run the risk of sliding down the slippery slope of considering somebody to be innovative purely for the mere fact of using some form of sophisticated technology, without any consideration for the material content they are preparing, the form in which it is prepared or the appropriate use of the tools available.

Taking this into consideration, we have considered several issues in this research study. Are e-learning platforms really useful for making changes in the education model, in accordance with the EEES objectives? How are they used and what effects does this usage have on both students and teachers? What models of education and learning are implicit in the different use of the platforms? Does the platform design respond adequately to the needs raised in the present context?

Would studying this type of proposals at greater length, help the university teaching staff, not only to become aware of the type of education offered, but also to have opportunities of support in continuing to confront the challenges posed in the formation and imparting of knowledge. Teaching staff require sustainable training at the time, in order to ensure that the e-learning proposals currently available on the platforms are then transformed into real changes in the paradigm of education and learning.

ASPECTS OF THIS RESEARCH IN CÁDIZ UNIVERSITY (UCA): DATA COLLECTION

Now let us see the following aspects of this research: Data collection, the characteristics of the teachers who filled in this questionnaire, the use of the tools currently on the platform, the content of the courses, and the evaluation tools used.

For the collection of data we have used two tools: an online questionnaire and a focus discussion group. The questionnaire was prepared from the contributions provided by the various researchers taking part in the study and opinions were asked from 6 researchers of 6 Spanish universities not participating in the study. The focus group was formed by 8 teachers from Cadiz University from different faculties and areas of knowledge.

The questionnaire was completed by a total of 59 teachers. In general, their characteristics were: Sex: 47,45% men and 49,15% women; Age: 76% between 31 and 50 years old; and Degree: 66% doctors.

With regard to the knowledge areas to which they belong, the majority are from the area of Social and Legal Sciences.

Of the 25 drilled tools, four surpass 50% of use, that is to say, those researched show that they use it fairly often, considerably or extensively. The tools most frequently used are electronic mail (69.4%), content administration (67.7%), calendar (62.7%), and student management (57.6)%. With regard to the digital portfolios we can see that its use is very limited.

The second group of tools that we would like to draw your attention to are those which exceed a 30% use. Three of these have exceeded this percentage, namely, forum (47,4%), evaluation tools and student self-assessment (42,3%), and educational guides (32,2%).

TOOLS	USE (%)					
	NO REPLY	NEVER	A LITTLE	FAIR	CONSIDERABLE	EXTENSIVE
Forum	10,2	5,1	37,3	20,3	20,3	6,8
Chats	18,6	67,8	11,9	1,7	0	0
Blogs	30,5	57,6	8,5	0	3,4	0
Distribution Lists	39,0	30,5	22,0	6,8	1,7	0
E-mails	11,9	0	18,6	20,3	23,7	25,4
News	32,2	25,4	20,3	11,9	6,8	3,4
Calendar	18,6	5,1	13,6	22,0	30,5	10,2
Videoconference	47,5	44,1	5,1	1,7	1,7	0
Personal Webpages	39,0	42,4	10,2	3,4	3,4	1,7
Portfolios	33,9	45,8	10,2	8,5	1,7	0
Student Management	22,0	6,8	13,6	23,7	23,7	10,2
Content Management	22,0	3,4	6,8	16,9	30,5	20,3
Space for collaborative group work	33,9	13,6	30,5	11,9	6,8	3,4
Deposit	57,6	20,3	6,8	3,4	10,2	1,7
Material Editor	40,7	10,2	18,6	15,3	13,6	1,7
Tutorials	28,8	25,4	20,3	13,6	8,5	3,4
Learning Activities Management system (LAMS)	54,2	25,4	11,9	5,1	1,7	1,7
Tools for student evaluation and self-evaluation	22,0	15,3	20,3	18,6	20,3	3,4
Teaching Guides	20,3	15,3	32,2	11,9	20,3	0

Table 1. *Percentage use of the different e-learning tools*

Finally, comment on the tools that have been used by a quarter or fifth of those surveyed and those that are barely used. With respect to the first group, one must contemplate important news (22,1%), collaborative group work space

(22,1%), and tutorials (25,5%). However perhaps more significant are those tools that are practically not used (14, more than half).

Why are only a few tools used on the platform? We give 4 reasons to justify this fact. Firstly, there has been a gradual increase in the use of the platform. In other words, in spite of being in operation since the 2003/2004 course, it was not until the 2005/2006 course, with the introduction of the Moodle platform, that a majority incorporation took place.

Secondly, the use of the platform does not mean that there is a motivation to incorporate didactic innovations or to adapt to the methodologies proposed by the EEES. Of the tools most often used, compared with others, tools that stand out are those which allow communication with pupils, mainly electronic mail and the calendar and secondly management tools, both content or student. Really, these are tools which increase the teachers´ control over the subject being taught, reinforcing the traditional role of the teacher being the central point of education and the students being the passive receivers.

A third reason is that some teachers use the platform as a support to class attendance and this is where they develop innovations of didactic character and a more centered methodology in the learning of the students.

The fourth and last reason, is the lack of competence of the students perceived by teachers and the demoralizing effect that this has on the teaching staff as a whole. On some occasions, resistance has been expressed by students towards initiatives adopted by the teaching staff, designed to enhance new competence for learning. The efforts made by the teaching staff in this new design and assumption of a new role for learning, are not always supported by the students.
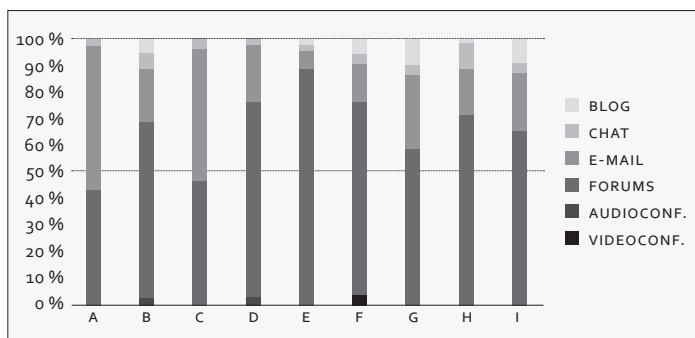

Indicate why the following tools are used

A first impression upon seeing the graph referring to the item of the question-naire "Indicate why the following tools are used", is that e-mail and the forum are tools that are used for everything. Hence, we can group the answers to the items intended to promote the information, especially from the teacher to the students (**A**: to increase the frequency of communication with the students; **C**: to clarify doubts regarding the content; **F**: to present cases; and **G**: to present content), we observe that except in F, where the use of the blog appears as a slightly higher percentage, in the others, e-mail and forums dominate the panorama.

On the other hand, items which try to retrieve interactivity between teach-ers and students and amongst students themselves (**B**: promote the collabo-ration in the formation of knowledge; **D**: present problems; and **E**: generate debates), continue to show a predominance of e-mail and forums, although it would be the forum which, if we were to take as a reference the remainder of possible answers, would have the highest level of use.

We think along the same line already indicated, that the platform is used above all to reproduce models centred on teaching and not so much on learning. The data collected from the item "Use the e-learning platforms for..." reinforces this idea. If we observe the graph we can verify that the three most frequent uses (fair, considerable, extensive) corresponding with **6** (provide students with access to information, **8** (present notes on the subject material), and **11** (improve organ-ization of information and resources), refer to tasks corresponding to teaching.

To conclude, we can deduce that there is a certain predominance of tasks centred on teachers, although there is an important need for all uses present-ed, in such a way that even the least usage is within the 50% of replies of fair, considerable or extensive use (in other words, item **1**).
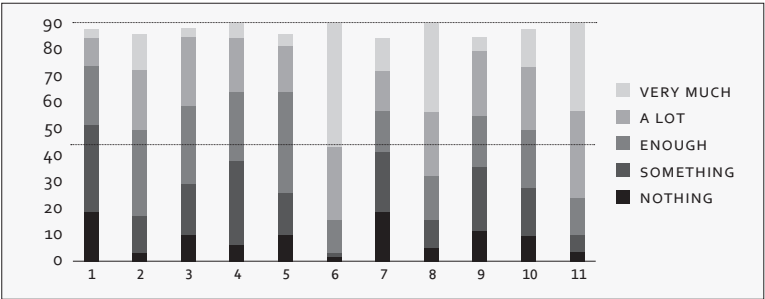


Used the e-learning platform for:

With respect to the content of the virtual courses, of the five aspects surveyed, question 4 stands out (digital materials set by the majority of teachers relate to relevant course themes, including preparation for topics to be worked on in class or when a greater depth of study is required).

In Cádiz university the platform is mainly used, as a support to the actual classes. Largely, this is due to the policy followed by the university itself. On the one hand, it has favoured the creation of virtual courses for optional subjects (which in many cases are not offered every year and the effort is not recompensed in the same way as if they were offered during a longer period). On the other hand, the core subjects, if virtualized, must maintain two groups, one virtual and another actual classes (with the duplication of efforts that this implies); and finally, in some careers such as Psychology/Pedagogy, the subjects are virtualized but remain as a 25% minimum class attendance. It is therefore, the support to actual teaching which will characterize Cádiz University´s platform. In this way, the idea is also reinforced that the virtual classroom, as a supplementary support, will maintain the form that is already being used daily in the traditional classrooms.

USE OF THE DIGITAL PORTFOLIOS

Let us now see what characterizes the teaching staff who use the digital portfolios. In the first place, it is necessary to emphasize that only 12 of those surveyed stated that they use, at least sometimes, the digital portfolios. This implies that the collected data is not significant enough to be able to draw extensive conclusions about their use by the teaching staff in general. Nevertheless, it does indicate to us, on the one hand, the little endorsement that this tool has amongst teachers, and the necessity to promote its use, with a view to going into greater depth into a methodology based on learning. Of the teaching staff who use the portfolios it is necessary to point out that 75% are men, over 40 years old, half of them teaching in the faculty of Education Sciences, and are assigned to the area of Social and Legal Sciences.

On the other hand, there are differences and similarities with the rest of the teaching staff regarding the use that is made of e-learning tools. They coincide with the general average in an increased use of the forum, electronic mail, calendar, management of the students and content. Nevertheless, where they
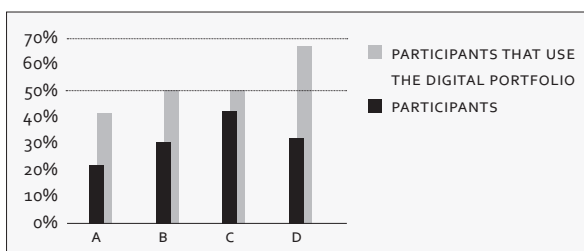
*Comparative of use between the participating faculty
and participants that use the digital portfolio*

do not coincide is in the high use (fair, considerable or extensive) which they make of other tools, such as the space for collaborative group work (A), material editing (B) tools for educational evaluation and student self-evaluation (C) and teaching guides (D).

In relation to the evaluation, we would like to emphasize that of all the tools being used, the digital portfolios, occupy a very small part.

One of the aspects in the survey was to assess the learning process of the students. By comparing the percentage of use of the different strategies made by teachers participating in the survey with the percentage of use of the teaching staff using the digital portfolios, we can emphasize two significant aspects. The first aspect refers to items 1 and 2 which `make an initial skills evaluation' and `value the level of handling of the platform on the part of the students before using it´, respectively. In these items appears around 20% difference in use in both. What can this mean? Using the digital portfolios can be identified with the concern of the teaching staff to locate and ´connect' with the competence level of the students. Also significant is item 8 which gathers data about ´the use of a specific tool at the end of the process. In this item, those participating in the survey use it 67.8 % as opposed to 50% of those using the digital portfolios. Although these are high percentages, we must note the inferior use, made by the group using the digital portfolios, most possibly due to the individual and group follow-up carried out throughout the process.

1   Carries out an initial evaluation of its prior know-how
2   Values the level of management of the platform of students before using it
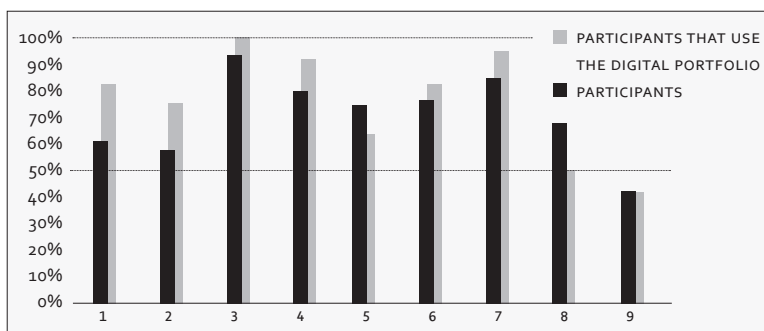
Comparative graphic relating to the monitoring of the students' process of learning

3 Bears in mind the activities carried out on the platform for susequent marking of the students
4 Uses evaluation tests to apply during the process
5 Uses tests at the end of the process
6 Uses self-assessment tools applied by the students themselves.
7 Evaluation tests returned indicating the reasons for the marks given
8 Uses specific tools at the end of the process
9 Uses tools for the evaluation among students

FINAL CONCLUSIONS

Throughout this research project we have emphasized some data which helps us see the state of use of the digital platform in Cadiz University and its impact on education and learning processes. We considered that the use of these technologies is an important point on which university policies, which have as an axis, methodological innovation based on the shift of paradigm, can lean. It is important to point out that the change must first be adopted by the teaching staff, supported by the institutions and then promoted to the students. Within the collected data, we also pointed out that the use of the digital portfolios implies for its users a closer approach and greater depth in the model of formation of knowledge on behalf of the students. In addition, it implies the assumption of a role of the most orientative and dynamic teachers, abandoning the idea that the teacher is the centre of the learning processes. In the

study carried out, the teaching staff used the digital platform and digital portfolios as a support resource for those attending university education. This has entailed a dynamic activation of communication processes and interchange between teachers and students, an update of content, a more flexible use of evaluation processes... In effect, a closer approach to that proposed in the EEES with regard to the roles which should be played by participants in the new era of university education at European level. Nevertheless, we still have a long way to go.

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THE USE OF DIGITAL PORTFOLIO IN PORTUGAL

STATE OF ART AND RECOMMENDATIONS FOR TEACHER EDUCATION

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INTRODUCTION

In this we present what has been done in Portugal on the use and theorization of portfolios and electronic portfolios and their articulation with the professional development of teachers. It was written within the framework of the *DIGIFOLIO* Project — *digital portfolio as the professional development strategy of the teacher* — a European Comenius project involving researcher and educator teams from different schools and institutions of Portugal, Belgium, The Netherlands, Check Republic and Finland.

PROFESSIONAL DEVELOPMENT OF TEACHERS AND PORTFOLIOS

The portfolio has been defended as a strategy, which favours the professional development of the teacher (Barrett, 2000; Zeichner & Wray, 2001). It contributes to displaying growth over a period of time and particularly to stimulating critical thought on educational practice. This refers both to the strict competences of teaching in a given context and to reflection on the political and

ethical dimensions of the teaching activity. Some authors have also shown that the teacher's use of the portfolio is 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 & DeMeulle, 1998; Barrett, 2000; Darling Hammond & Snyder, 2000; Harland, 2005; Kaplan, 1998; Zidon, 1996).

The electronic portfolio has brought other benefits among which Barrett (2000) highlights the acquisition and development of competences in the field of multimedia technology and the isomorphic and multiplying effect they may have on students: the teacher uses the electronic portfolio and students are also tending to use it.

CONCEPTION OF THE ROLE OF THE TEACHER

Teacher training, assessment and career promotion in Portugal are based, in legal terms, on the Educational Framework, the Legal Training Regime, the Legal Framework for Continuous Assessment and the Teaching Career Statute. The legalities defined in these fundamental documents specify that the teacher has the role of *educational professional*, thus, breaking with conceptions still held today that the teacher is a technician or even employed in Central Administration to put educational policies into action. This perspective also goes against a fairly widely spread idea that the teacher is also responsible for social work. This idea is rooted in well-known transformations within the framework of the family and society in general, which appeal to a

far broader involvement of the school and its main agents (without, however, altering training practices for the teaching role).

A model of professional development, which emphasises the responsibility and autonomy of the teacher in his/her professional performance as well as his/her skills in critical analysis and innovation, corresponds to the afore--mentioned teacher model. This professional development model focuses on a teaching activity which requires the teacher to be able to analyse certain situations in each work context, to define aims and appropriate, specific strategies for each situation, to collaborate with colleagues in local curriculum management and to continuously monitor its practice.

The demands of this model are confronted with a reality in which practices and conceptions conveyed by tradition still remain and where several types of constraints may be detected, namely the persistence of other conceptions over the social role of the teacher and ways of training and assessment of professional performance which are incongruent. Therefore, according to the model underlying the above-mentioned framework, the teacher is considered to be an active, autonomous and responsible agent, aware of his/her training needs. In other legal documents and practices the teacher is conceived as an employee or passive technician, incapable of making autonomous decisions regarding his/her contextualised practice, dependent on inflexible regulations on "what can and should be done", and forced to participate in training courses, not because they correspond to his/her needs or professional challenges, but because Central Administration believes them to be important for spreading information or because they are requested in order to obtain salary progression.

As far as continuous training is concerned, the most frequent practices are those that lead to the course attendance, in spite of there being a reiterated discourse on the teacher as a reflective and innovating professional, capable of developing research processes. The forms that appeal to the active and responsible participation of the teacher in training are less frequent and the levels of participation in the conception and management of training course plans leave much to be desired.

In short, we may say that the legal framework defends the teacher as an autonomous and responsible teaching professional but, in practice, there is still ground to be covered and obstacles to overcome.

If, as regards discourse on the subject, importance is given to innovation and research, the reality in the majority of schools falls far short of this mark.

As far as the *portfolio* is concerned, we may say that there is a fairly positive reception to innovative methodologies regarding training, among which we may include the use of the *portfolio*, whether for the teacher him/herself or to be applied in pedagogical practice with students.

It is important to point out that in terms of work context, the characteristics of curricular organization that will have to be considered by the teacher in his/her pedagogical practice have a strong impact on the teacher's action. Recent alterations in the national curriculum of Primary Education, translated into the definition of a curriculum of competences, have introduced extra-curricular areas oriented to the acquisition of transversal competences, namely on a learning how to learn level, and have suggested the use of a student file which should accompany the student throughout his /her compulsory schooling. Such innovations, which are being integrated in a process of implementation of flexible curricular management practices, offer an area of work which is propitious to the use of differentiated forms of learning assessment and curricular organization, among which the *portfolio* has come to acquire popularity.

On this basis, well-established publishers in the school textbook market have produced some publications on the use of the *portfolio*. They have emerged in the form of its user guides and propaganda tools for its broadcast (Bernardes & Miranda, 2003; Coelho & Campos, 2003; Nunes, 2000).

The *Iniciativa Ligar Portugal* (*Connect Portugal Initiative*) was simultaneously created as an integrated strategy in the *Plano Tecnológico do Governo* (*Governmental Technological Plan*) with a view to the "establishment of the individual electronic file (*portfolio*) of the student who is completing compulsory schooling, in which all relevant work is registered, relevant practices acquired in the different fields (artistic, scientific, technological, sport and other) are verified and effective use of the information and communication technologies in the diverse school subjects is displayed" and which fits into the E.C. programme, *Eurofolio* 2010.

The introduction of the *portfolio* in governmental/legal discourse regarding teacher training and practice is equally accompanied by its appropriation in discourses on the practices of recognition and certification of competences in adults with shorter periods of schooling. Both discursive strands are based on the idea of an individual being capable of constant self-training and, thus, easily able to adapt to the constant social and market changes.

RESEARCH

Recent curricular alterations have been accompanied by a proliferation of publications tending to support the teacher in the change of practices. Some are based on research, others are of a marked didactic nature, some are more directed practices of conception and planning and others are more geared towards the implementation of the teaching/learning process and its assessment. It is in this context that the *portfolio* theme emerges most significantly.

However, even before this period (2001/2006) there were two authors in this area whose references are included in subsequent publications and which serve as the basis for research on the *portfolio*. One of these authors, in this case a collective one, is a work group from the IIE (Education Ministry) which was formed to carry out research and to examine assessment conceptions. They presented very "encouraging" results on the use of *portfolios* in a training course for trainers, suggesting the use of this instrument as a means to creating a new pedagogical culture (Cardoso, Barbosa & Alaiz, 1998; Fernandes, 1997; Fernandes *et al.*, s/d).

A researcher from the University of Aveiro, with knowledge about these works, began to present studies which sustained the use of the *portfolio* in the undergraduate training of teachers, more specifically, in supervision practices (Sá-Chaves, 1998, 2000).

These initial research projects and reflections on the successful use of *portfolios*, with a view to changing conceptions, assessment practices and the professional development of teachers would be used from then on as a basis for the ongoing development of such studies and as "praise" of the *portfolio*.

In the meantime, research projects on post-graduate training were underway and articles and chapters of books began to emerge presenting successful situations. Despite being relatively limited, this corpus of publications, focusing on teaching and training levels and diverse subjects was important, though a lot of the literature was not so much a discussion of research products, but rather grounded in descriptions of interventions and experiments or isolated cases. However, all of them, from a perspective of promotion, change and innovation, advocated and served as examples of the advantages of the use of the *portfolio*.

Research projects for academic qualifications (Batista, 2004; Coelho, 2000; Menino, 2004; Parente, 2004) highlight the teacher's use of the *portfolio* as an assessment strategy on different educational levels (for instance, pre-school

and Mathematics in the 2nd cycle of primary education) and in its use in the undergraduate training of Biology teachers (Grilo, 2004).

In these theses the researchers introduce a new practice with the purpose of studying the conceptions of the agents involved. On this level, the authors can confirm the advantages of its use in the promotion of reflective practices, in student participation in the assessment process and in the awareness raising of learning processes.

The difficulties encountered were related to time management, new teacher duties and the need for training in assessment. These kinds of drawbacks are proof that, in spite of the fact that on a legal framework level there are interesting conditions for the implementation of *portfolios*, teacher practice is still very much a part of a different culture. This, in fact, restrains a truly flexible management of the curriculum and, particularly, the large-scale use of reflective and monitoring instruments in practices, such as the *portfolio*.

On a theoretical level, the theses are grounded in the theory of assessment and in development and learning theories. When they try to provide a more in-depth analysis of the specific issues regarding the implementation of the *portfolio* in the classroom, the authors support themselves with foreign references, given the scarcity of a more detailed national literature.

Furthermore, these theses all present a wide range of meanings for the *portfolio*. They generally begin by presenting a definition of *portfolio* and of several types of classification of *portfolio*. It is frequently mentioned and described as a product, resulting from a process but not as a curricular model or methodology of pedagogical work. In general, the studies still continue to be tied to the reflection on whether there are advantages in the use of the *portfolio* or not, thus, showing that this technique is still being experimented by both teachers and researchers. The lack of critical material may also be viewed as a sign of its incipient presence in this field of education.

As far as theoretical production is concerned, the association of the *portfolio* with reflective practice, the promotion of transversal competences and awareness raising about learning processes may be verified. However, there are few references to the development of specific competences. The *portfolio* is also presented, primarily, as an instrument of assessment/demonstration and less as a learning instrument.

In any case, Idália Sá-Chaves is the most quoted and well-known national theoretical reference and continues to publish presentations of cases in which

the *portfolio* is used (Sá-Chaves, 2005), thus, contributing to the divulgence of these experiments to different audiences, namely future teacher students and teacher trainers and to the formation of a work network among higher education institutions. The cases mentioned belong to different areas of knowledge and training levels. Its use in higher education undergraduate and post-graduate MA and PhD courses is of particular relevance. In this sense, the *portfolio* is also frequently used as a support of research-action methodologies, in experiments of a wide variety of educational levels and in a number of different subject/curricular areas. The author is also responsible for coining the idea of a reflective *portfolio* in the field of teacher training and practice.

PRACTICES

The afore-mentioned use of the *portfolio* is documented mainly in higher education, in undergraduate teacher training but specifically during teacher internship and despite some resistance, it seems to have spread.

As far as the practice of *digital portfolios* is concerned, it is still fairly scarce and concentrated in very specific groups.

So, in university undergraduate training subjects, the students of Didactics and Educational Technologies (University of Aveiro) construct "digital portfolios" which are presented as a *homepage*, accompanied by theoretical training and reflection. In this case "digital" may be translated as the use of a specific format for information: it is an *online portfolio*.

An online application called DPF (*Digital Portfolios*) was developed in the Science Faculty of the University of Porto. This application is the result of an educational experiment in the Chemistry Department and is used by students in their final year of a Project subject. With alterations, the application may come to be used in continuous assessment (Norberto *et al.*, 2005a, 2005b).

As a tool still undergoing development and associated with Computer Studies, it is possible to find some sites that organise specific information on this theme, such as "O Mocho" (www.mocho.pt — Site for the Teaching of Science and Scientific Culture), *e-Portfolio* (http://nonio.eses.pt/eportfolio — Site of the Vernier Center of the Santarém Institute of Further Education, with resources on *e-portfolios* and which is presented as a meeting place for discussion, resource availability, divulgence of experiments and products,

project development and research on *e-portfolios* in Portugal) and, finally, GT-PA (http://portefolios.no.sapo.pt/ — The Work Group — Pedagogy for Autonomy (GT-PA) created in 1997, in the sequence of studies and projects at the Department of Educational Methodologies in the Education and Psychology Institute of the University of Minho, which were carried out in the fields of teacher training and pedagogy of language, with particular focus given to the concepts of "reflection" and "autonomy").

The use of *weblogs* may also be considered a similar practice to the use of *portfolios* since it permits the presentation of/reference to products accomplished by the student. This gives a progressive dimension to the student's work with the production of a personal reflection throughout the training process. This is the case of the activities proposed to the students of Educational Technologies subjects, in the Educational Sciences degree course at the Faculty of Psychology and Educational Sciences of Lisbon University where the authors of this report work (some of these individual works remain available even after the semester has ended and may be consulted online, such as, for example: http://hemajoro.blogspot.com/, or http://mariatec.blogspot.com/).

Weblogs have come to be used in the undergraduate training of teachers and by teachers, themselves, in their pedagogical practice. Nevertheless, as far as teacher practices are concerned, *weblogs* are used essentially as interactive communication platforms and to reinforce group identity (for example, Geographism: www.geografismos.blogger.com.br, which is maintained by a teacher from Luísa de Gusmão School and has given rise to *blogs* by students). We cannot forget that the easy access to free *weblog* engines facilitates its use for a variety of purposes, but is not generally accompanied by a training process of pedagogical work with a tool.

A multidisciplinary project called *Uma Viagem às Origens: Experimentar a Astrobiologia* (*A Journey to the Origins. Astrobiology in the Lab*), co-ordinated by the projecto Ciência Viva (Live Science project), involves the Science Faculty of Lisbon University (Education and Environmental Biology Department) and primary and secondary schools. (Francisco Carrapiço, Ana Lourenço, Luísa Fernandes, Telma Rodrigues). The aim of the project was to create a curricular reorganization project in which students would be given the possibility to have access to new information and communication technologies and to accomplish laboratory activities. The project mentions the construction of a digital *portfolio*

with material developed by the teachers and students involved in the conference of 2001. In this case, the *portfolio* seems to be a support for developed work since it was constructed at the end and not throughout the process.

Already in the University of Aveiro, which has *e-learning* courses and complementary lessons available, the platform used offers an *e-Portfolio* functionality. The training workshop *Formar Professores em Rede* (*Network Teacher Training*) led to participants constructing "electronic *portfolios*" which are samples of *online* work.

SYNTHESIS AND RECOMMENDATIONS FOR TEACHER EDUCATION

Our analysis on the research and reflections in this field show 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:

— 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.
— 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".
— 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.
— 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.
— 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.
— 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.

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ASSOCIAÇÃO DE PROFESSORES DE SINTRA PT

Associação de Professores de Sintra, Portugal, is a non-profit teachers' regional association, created in 1992 with the main purpose of supporting teachers of all levels and to enhance their professional development. APS cooperates in a regular basis with 140 schools both public and private in the field of education and it is supp orted by the Municipality of Sintra, considering the interest of its initiatives for the teachers and schools of the region, as well as by the Portuguese Ministry of Education.

The past years allowed the international participation of APS in European Cooperation Projects and assumed the coordination of the Comenius 2.1 project Digital Portfolio as a strategy for teachers' professional development.

E-Portfolio in Education—practices and reflections addresses the use of digital portfolios in educational context and it is one of the latest dissemination activities of the Digifolio project – *Digital Portfolio as a strategy for teachers' professional development,* a COMENIUS 2.1 project which was carried out between 2005 and 2008. It involved several universities and teacher training institutions from five different European countries.

The project, which main focus was the reflection on the potentialities of portfolios and digital technologies in the perspective of teachers' professional development, came to its end with an international seminar which aimed at disseminating the work produced in the frame of a previous teachers training course, as well as allowing and welcoming the contribution of other education professionals with their practices and reflections on the above-mentioned thematic.