TEACHER PROFESSIONAL DEVELOPMENT
AND DIGITAL PORTFOLIOS

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1. Teacher competences within the European context

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

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

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

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

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

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

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

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

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

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

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

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

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

*Digital portfolio as a strategy for teachers' professional development*
- cultural awareness.

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

Finally – for those interested – the Commission published an overview of all important documents in within the Bologna process and the integrated framework “Education and Training 2010”\(^1\).

2. Teacher professional development

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

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

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

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

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

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

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

Strategies for capacity building intend to build new collaborative capabilities and skills for teachers. Basic idea is that the amount of information in the information society cannot be handled by the teacher only by himself. Collaborative working methods bring new aspects to the learning process. Understanding of the meaning of new ways of collaboration will make the boundaries between formal and informal learning harder to draw. Some basic skills will be information skills (because of the character of changing information). This will follow to the new practises for knowledge building among
creative workers. Below there is a picture which illustrates the change process of professional development (Fig. 1).

![Diagram showing the change process of professional development with axes for time and impact, and stages for awareness, attitudes, and behaviour.]

**Figure 1**
The change process of professional development

**Facilitating informal learning in the workplace**

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

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

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

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

1) Lack of time of learning. In many cases greater numbers of learners with special needs were being integrated into the classrooms and teachers have to deal with the integration and the challenges the integration presents in everyday work. In this conclusion is included the concept of lack of non-teaching time.

2) Lack of learning resources. Teachers have been lacking proximity to very important learning resources in education: other teachers' classrooms, computer technology and libraries. The access to the computers is one key question nowadays.

3) Lack of meaningful rewards for learning. Teachers are involved in many non-teaching activities (student clubs, mentoring teachers etc.) which can be a great way to gather new ideas about teaching and learning (like sharing their expertise with others). However, those teachers who have been involved in this kind of activities have received few, if any extrinsic rewards for participating in these activities.

To minimize the influence of these three conclusions, the following strategies are proposed. First, increase the unencumbered time of learners to provide greater freedom to participate in informal learning activities. Secondly, reducing the physical distance between learning resources and learners to increase efficiency with which resources are accessed. Thirdly, related strategy is to expand access to communication technology as a means of improving the efficiency of
information gathering activities, especially when close physical proximity to resources is not feasible.

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

3. Teacher education models and types of teachers

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

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

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

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

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

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

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

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

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

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

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

- Tools that teachers can use, for example, to search, to analyze, to structure and to elaborate information (Papert, 1997);

- Tools that allow the active involvement of the students in the resolution of problems and taking decisions in virtual environments express created for that goal (Risko, 1991; Bransford, Brown & Cocking, 1999) or in the exploration, under multiple perspectives, of different situations of real work of the teachers giving them a rich and deep understanding of the questions of the practice and the knowledge
allows answering them (Cognition and Technology Group, 1990);
- Tools to develop the capacity of analysis and diagnosis, on the basis of "real cases", for example, on the ways as students think and react to the different work strategies.

Perhaps the most important aspect in this perspective is the development of the capacity to create new chances of the curricular point of view, bringing real and authentic problems to the classroom, putting students to explore them (Bransford, Brown & Cocking, 1990). Using "cases", but also using real situations or the connection to other professionals and scientists in different fields, working together and sharing tools, methodologies and experiences (collaborative learning) can be excellent examples.

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

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

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

The knowledge based society is to be built on eight key competences (KCKBS 2005). The key competences should have been developed by the end of compulsory school or training and should act as a foundation for further learning as part of lifelong Learning (RCKBS 2005). It is the reason why their
mastering has to be a part of teachers’ professional training and
development. The development of an ePortfolio involves
considerable competences and abilities in terms of literacy
(Attwel 2005, p.4), communication, using ICT, self-
management, social, intercultural, interpersonal and civic
awareness, entrepreneurship and cultural identity. In this
relation it looks as a very convincing argument that digital
portfolios can be used as the unique supporting tool just for the
development or improvement of these key competences, (i.e. in
Communication in the mother tongue, Communication in a
foreign language, Science, math and technology, ICT skills,
Learning-to-learn, Interpersonal, civic and social skills,
Entrepreneurship and Cultural awareness as a part of
intercultural skills).

**Essential issues in the use of digital portfolios for professional development**

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

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

In addition to access, ICT capabilities and desire for learning,
there are several other significant design and implementation
issues that influence the sustainable use and development of
portfolios by teachers. It was discovered that the most
important issues are the definition of the purposes for digital
portfolios, consideration of the context and meaning of
institutional culture, provision of support for teachers,
development of user-friendly technological tools, collaboration in the portfolio design and implementation, and reflection on ethical issues. It became evident during the action research process that teachers' collaborative reflection was an essential part in all cycles of portfolio development. A portfolio provides a means to make collaborative reflection visible and sharable with others (Kankaanranta, 2002).

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

5. Implications for teachers’ training

*Teachers’ challenges and success factors of digital portfolio usage*

Although a strong consensus exists today on the relative importance and relevance of the computers for educational purposes, there seems to be a concern due to its feeble use and difficult integration in the different areas of school work, with special attention to the curricular activity (OCDE, 2006; Plomp & Perlinger, 1991; Simmons & Wild, 1991).

One of the main reasons pointed out for that is the lack of preparation of the teachers or an inadequate preparation. Nevertheless, when inquired directly, teachers show a favourable attitude and a bigger interest for its pedagogical use (Paiva 2002, 203).

Actually, what teachers seem to say is that they understand the importance of the computers in the society of our days and that they would like also to use them in curricular activities with their pupils, but they do not know how to do it in a concrete way. Considering that, we think that it is exactly in that area that we must point out the strong points of the DigiFOLIO project. Bearing in mind that one of its goals is the development
of a program for teacher education using an innovative strategy of work - the use of portfolios -, we stress out the adoption of digital technologies in its implementation.

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


- "Portfolios are key tools for teacher development and they should be designed to promote reflective practice. [emphasis added]

- Portfolios should be shared with colleagues, because colleagues are an important source of creative input and because such sharing promotes collaboration.

- Portfolios should be encouraged for cooperating teachers as well as for student teachers. Portfolios present a model of teachers as learners and as professionals who "make sense" of their work.

- Portfolio development should be a "bottom-up," voluntary process that is owned by teachers and not used for evaluation purposes. The best way to kill it would be to make it mandatory or to use it for evaluation. Key benefits are lost if the reflective culture of professional development is replaced by a "culture of compliance" - where teachers go through the motions of assembling materials according to a predated checklist. [emphasis added by Barrett & Wilkerson]
- Portfolio development for experienced teachers should be supported by enabling conditions: for example, time, money for materials, some structure or facilitation for the development process. Modest extrinsic motivations, such as credit, may be used to encourage teachers as long as they do not take over and transform the activity into a compliance experience.” (Barrett & Wilkerson, 2004).

**Functions and benefits of digital portfolios in teachers’ professional development**

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

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

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

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

1. What **attitudes** must be developed (and how) to open teachers’ minds for using digital portfolios as a personal strategy of professional development?

2. What **knowledge** must they acquire (and about what?) for being competent in using digital portfolios as a self-reflection and self-regulation strategy?

3. What basic **skills and competences** must they acquire in order to start using the digital portfolio strategy in their practices?

**Awareness**

The culture and context of an educational institution is a critical component in determining the possibilities and constraints for the design and implementation of digital portfolios. The support of the community is crucial for the effective progress of the portfolio development process. Kankaanranta’s (2002) study proved that “important characteristics of internal support include a general approval and valuation of reflective practices as an inherent part of the school culture, a whole-school approach emphasizing collaboration in assessment practices, and more practical issues of ensuring sufficient access to computers and ICT training for teachers” (p.220). Furthermore, she proceeds to elaborate the crucial features of a **portfolio culture** which include at least valuation of reflective practices, active collaboration between diverse actors within and outside the educational community, and interest in the work of others. Developing a portfolio
culture presumes that the portfolio approach is considered and valued as an essential part of pedagogical practices. (p. 221).

**Access**

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

**Implementation**

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

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

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

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

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

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

In Kankaanranta’s study collaborative reflection emerged as an essential part in all cycles of portfolio development, and collaborative reflective practice was perceived inherently present in portfolio development from the outset, since portfolio work introduced to teachers as collaborative activity. Collaborative reflection and individual thinking can be made visible through a portfolio. In addition to providing a means for communication a portfolio can give rise and stimulate reflection. (Kankaanranta 2002, 229-230). When a portfolio is shared with others, professional development through peer support and peer review is enabled. These are particularly important, since previous studies have shown that diverse methods are required to scaffold teachers in reflecting on their
experiences and making connections to pedagogical practices (see Kankaanranta 2002, 221).
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