Digital learning portfolios:

inventory and proposal for Swedish teacher education

BA – thesis / C- uppsats
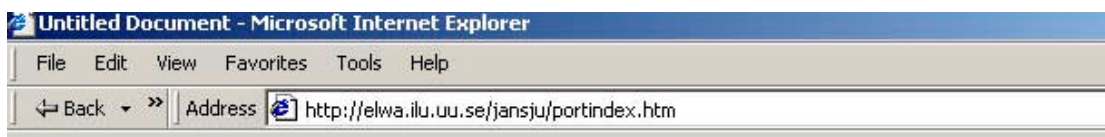
Portfolio, portfölj, en läderväska med mina mest värdefulla dokument.

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INTRODUCTION

Part 1 Introduction

1.1 Abstract

This study gathers information on several different kinds of digital portfolios in and outside education, but focuses of digital learning portfolios for teacher education purposes. It deals with ideas of learning and assessment in portfolio methodology as well as technical and design aspects. A digital learning portfolio project in Swedish teacher education is brought up as an example. The study ends with a proposal for Swedish teacher education for implementing digital learning portfolios and considers the need for metadata as well as development of digital portfolios as toolbox and respository.

1.2 Acknowledgments

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Jan Sjunneson

1.3 Introduction to digital portfolio development

Portfolios have been around for a few decades in Western education, but recently transformed with the use of ICT (Information and Communication technology) to be published as web pages on Internet, on intranets or CD ROMs. The expression *digital* is used instead of *electronic* portfolio since this study relies on material made digital. Videos for example could be analogue for instance, but the focus here is digitalized video clips that one may find on the Internet. But it is common to use both expressions interchangeably.

Children started first with paper portfolios in elementary schools in 1970s in Great Britain. Soon higher education institutions such as teacher colleges followed the trends by starting with paper folios, binders, files and videos .But as for the children, ICT supported solutions for portfolio work and documentation were more flexible and more fun to use, so the teacher students, and sometimes their teachers and experienced colleagues, went digital in early 1990s.

The study is divided into three headings. INVENTORY, PERSPECTIVES , PROPOSAL.

- ? INVENTORY is a rather descriptive inventory of several kinds of digital learning portfolios.
- ? PESPECTIVES brings up some aspects of technology and design, assessment and learning.
- ? PROPOSAL for using digital learning portfolios in Swedish teacher education.

Many guidelines, standards and checklists are included in the appendices and left uncommented. For readers interested in pursuing practical questions these might come in handy. Many teachers have practical questions on digital learning portfolios and it is hoped that prospective portfolio supervisors and students reading this study will benefit from what is collected. On-going portfolio projects using ICT are mentioned too even where they are just about to begin. They show the great interest that educational institutions have worldwide. The same guidance is offered to readers looking for partners and ideas in international development.

1.4 Methodology and theory

Some material for this investigation is brought from websites, mostly American, containing portfolios of various kinds. A small survey was made in two Swedish courses in teacher education that makes up the bulk of the empirical material in this study.

Theoretical comments are multifaceted in this expanding field and I rely on several kinds of traditions in educational theory. Most is rather descriptive and left uncommented. The inventory is drawn from my own practice, exploration of others' practices and innovations.

1. 5 Purpose of this study

The purpose of this study is to explore the uses and methodologies concerning digital **learning** portfolios in education with focus on teacher education within a perspective of what other kinds of digital portfolios that could support learning and managing digital contents better.

Another source of experiences worthwhile considering are portfolios made by professionals inside and outside higher education, student portfolios across the disciplines, K- 12 pupils' portfolios and other kinds of portfolios. The study cannot go through all these kinds in detail but will try to make overlapping discussions where suitable. Many problems and characteristics are similar due to technology, forms of presentation and assessment. They all lack methods and ideas for long term availability and qualified organisation of contents. This study scans the portfolios that exist with the overall ideas that many need go on to the next Internet generation, the Semantic Web built on metadata[1].

This work is not as much a scholarly piece as it is a map and inventory over current development in a fast changing field. The field of study, web pages and software applications, are not well suited for academia but must be considered as an investigation of current projects, feasibility studies and as an exploration of what digital portfolios in Swedish teacher education could look like.

Questions I want to pursue:

- ? What kinds of new forms of assessments and learning, working methods, design and technology might the digital learning portfolios promote?
- ? What can be learned from the digital learning portfolio experiences at the LICT – course at Uppsala university ?
- ? How can Swedish teacher education use digital learning portfolios ?

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[1] www.semanticweb.org

INVENTORY

Part 2 Portfolio perspectives

2.1 Background to portfolio thinking and assessment

Portfolios aim to stop storing important things one has learned from in the back of the car, the attic, and cellar or under the bed. Portfolios are more than containers. But there are differences with a portfolio that aims for learning and ones that aim for showing others one's professional strengths. Also, a portfolio used as a work tool with a repository of relevant working materials which differs from the other too.

The learning portfolio idea came into schools and educational systems in the1970s. At first in Great Britain and New Zeeland, but now portfolio thinking is spreading to schools and higher education all over the Western world. Portfolios had up until then been used by artists, architects and others who needed to collect and show their work in an effective way. They were without comments on learning and reflection though. It was a collection of artistic or written samples in a portable case.

Etymologically, the word portfolio is made up from Latin, *portare,* to carry or hold, and *folium*, paper, sheet. Its outer material form may be folder, file, binder or a floppy computer disc, CD or a web site. A portfolio is not a scrapbook that one puts everything is, as in pile of papers in storage, adding one thing to another without thinking and commenting its value. A portfolio in education is something that organized and reflected upon within a learning perspective. The students or pupils must make choices out of a collection of many items and present the contents to a teacher or a public, as on the Internet.

My definition of a learning portfolio is that it is a personalized collection of one's work as a learner that focus one's self-assessment by reflections along with different artefacts that provide, in files digital or in cabinets, others to explore one's development and competence within a certain field of learning. This is the kind of portfolio that will be considered here. The learning portfolio whose medium is digital, that is the Digital Learning Portfolio.

To make a learning portfolio is a personal creative act. The process of portfolio construction is said to pass these four stages:

- ? **Collection.** The portfolio's purpose, audience and use of artefacts will determine what to collect
- ? **Selection or Organization***.* Criteria for selecting materials must be related to the learning goals set by student and teacher
- ? **Reflection***.* Comments on what certain artefacts mean and what one has learned, including an overall reflection
- ? **Presentation***.* Make portfolio easily readable, reachable, designed and creative.[2]

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[2] These four stages are stated in Wyatt III/ Sandra Looper (1999) and Danielsson /Abrutyn (1997) but similar rigid beliefs in linear prescriptive study methodologies abound. The latter authors notes nine (!) various kinds of portfolios.

But seldom is this linear structure followed in reality. People may start at the end, or not use this sequential idea at all since the purpose of the portfolio is to use it as a toolbox, a storage, a repository that no one will look into. I will however present the digital learning portfolios in this study without much elaboration on the process of constructing them. The drawbacks of linearity will be brought up in the end where the learning portfolio is questioned somewhat in contrast with the portfolio as a toolbox and repository.

The main idea in learning portfolios is to support students' self- reflection so they take responsibility for their own learning and are able to show others what he or she has learned or is able to do Evaluation is usually more open and flexible, but may be crueler than ordinary tests and evaluations. Of course there are disadvantages with portfolios too, but they will to some extent be brought up later in this study.

2.2 Portfolio assessment and evaluation
It was the poor outcomes in the 1970s of primary school pupils, high school graduates and university students that spurred educational institutions in the Western world to enforce other ways of evaluation than regular tests. With portfolios where students themselves set goals and ways to prove that they reached them, evaluation got more learning and learner centred. Many teachers witness that their teaching improved, classroom climate more focused on responsibility and that an evaluation process based on portfolios was more authentic and holistic.

Another advantage is that the students know better what grades to expect related to amount of study if they are involved in setting goals and ways to show evidence of reaching them. Tests are not that easy to anticipate. Portfolios support a learner's maximum potential rather than a minimum level of competency, which is in focus in regular American testing procedures[3].

In Sweden similar dissatisfaction with standard testing in higher education has led to pursuits of alternative assessments. The Swedish government and Ministry of education have several times declared that new initiatives in assessment and evaluation in higher education are most welcome[4].

Primarily, when portfolios are being used for evaluation and assessment, a new relationship in teaching is for most part needed between the teacher and the pupils/students. The teacher can adapt the teaching better if he/she sees learning results presented in portfolios. Teachers need also, of course, to set reasonable and clear goals, and support the pupils' portfolio development. The first hard obstacle though is to persuade the pupils that it really is their own portfolio, not primarily a

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[3] "There were also other concerns with minimum competency testing: students' minimum competencies were frequently measured on the basis of just one test; many of these were structured similarly to standardized test, questions arose about validity and the alignment of curriculum, instruction and assessment/…/While widely acceptable for a long time, these evaluations have provoked questions concerning what the tests tell us about student learning. None appears to offer information about an individual student's reasoning processes". P. 8, in McLaughlin/Vogt (1996). They also note that slightly more students with portfolios get A grades, p. 68- 69. For dissatisfaction with assessment and performance in teacher education see the introduction in Lyons ed. (1998).

[4] *Regeringens budgetproposition 1996/97:1. Utgiftsområde 16: Utbildning och universitetsforskning* as quoted in Lindström (1997) and Utbildningsdepartementet (2001).

collection for teachers to grade, discuss and evaluate. This tension between common standards and individual creativity is crucial to overcome for development of quality learning portfolios.

Secondly, colleagues, parents, school administrators and other stakeholders have to know that the portfolio assessment deliver the same, or better, results as regular testing. Making portfolios is not easier than taking test. Structuring portfolio development needs as much criteria and procedures as without. Standards are common in portfolio assessment as will be seen in this study. Evaluation is an important aspect of portfolio development and several ideas in this study concern evaluation vs. other aspects that the digital form accelerate (design, technology, creativity, learning, repository, toolbox).

Thirdly, a portfolio may have several aims but they cannot contradict each other. Assessment should be directed towards clear stakeholders and audiences. The original idea about portfolios for educational assessment purposes has been to show artefacts within a personal learning context that either supports a *formative* process in a "developmental portfolio" or a *summative* process in a "show case portfolio".

For instance, one's *formation* to become an educated senior high student could be a collection of what one has done in schools from early written sketches of lab reports to full-blown science projects with examples of every stage in between, no matter what the learning outcome was. One's *summation* as senior high school student would be the best pieces that show one's ability in science where only progress is registered for assessment, not the process. Of course mixed versions exist, but in general the two kinds of portfolios apply also on the web.

A fourth kind is developing out of the summative, the *marketing or employment portfolio* where no sign is shown of one's shortcomings. The purpose here is not learning but to show employers who they can hire, or to show how good the web designer is. This does not make any personal homepage with a CV a portfolio, though some really strive to use portfolio items in a similar way as learning portfolios

Another kind of portfolio that has been used in teacher education is the *performance portfolio*[5]. It shows samples of process as well as best products, but focuses more on the whole picture of a performing teacher student as a becoming professional with engagement in learning matters.

Artist and architect portfolios are always of the employment portfolio kind. Nobody would hire them showing their first drawings. But the purpose in learning portfolios is different. Central is the learning process and how it can be supported by the learner's own self-reflection. The buzzword is *meta-cognition*, a perspective in learning, which emphasizes reflection on one's learning. The idea will appear in this study but not as a central focus.

2.3 Learning portfolio development and failures

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[5] P. 107, in McLaughlin/Vogt (1996).

Important for all evaluation strategies is the goals towards the learner are striving. The teacher and student must set the goals together or otherwise the portfolio does not become the student's own. Goals have to be made clear and relevant, a hard process at first for both teachers and students, going down to the nitty-gritty of practical decisions and productions.

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

Dairies or weekly reports are useful to remember what went well, what was learned, what one did to solve difficulties and for planning next period. Useful practical guidelines and methodology are prevalent and make up most of debate around portfolios; how to do it, where to store it, what to include etc[6]. Questions that take an entirely new turn when portfolios become digital and new practical questions have to be answered.

Faults, misinterpretations, fake etc abound nonetheless in portfolio development. The well-experienced educationalist and commentator on portfolios Lee Schulman notes five dangers

1) **Lamination**. A portfolio becomes a mere exhibition. Style and glossy presentations take over from substance.
2) **"Heavy lifting".** The opposite of 1). Too much work for no purpose
3) **Trivialization.** After initial effort, one learns what take least effort and documents only the easiest things, with poor reflections.
4) **Perversion.** If portfolios will be used as a form of high stakes assessment, why will they be resistant to perversion than all other forms of assessment have been? Objectivation leads to portfolios as a very very cumbersome multiple-choice test.
5) **Misrepresentation.** Samples that only represent situations and knowledge very remote from everyday work and progress.[7]

Teachers and people supervising portfolios should be aware of these dangers.

2.4 Digital learning portfolios
It was inevitable that learning portfolio development should go cyber. All practical problems with storing paper files from kindergarten to high school, individuals showing paper files and collections to teachers in crowded classrooms, restriction of access only to teachers and parents, poor possibilities to easy overview a student by sorting and browsing files, folders and papers.

ICT provide solutions to many of these problems. Whether accessible on the web, disc, CD or on a school intranet, a teacher find the student work easily. Digital

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[6] In Swedish recent introductions are Ellmin (1999) and Ellmin/Ellmin (2000). Other books include Ackelman (2000), Taube (1995), Henriksson/Sandell (2000) and Bern et al (2001). Swedish evaluations of portfolio methodology comprise Lindström/Ulriksson/Elsner (1997) and Andréasson/Berg/Jonasson (1997). Guides in English for paper portfolios in K-12 schools abound, for instance Sunstein/Lovell (2000) and all publications at http://electronicportfolios.com/portfolios/bibliography.html
[7] P. 34- 35, in Lyons ed. (1998)

portfolios are usually more diversely illustrated than before with hyperlinks, sounds and images, films and animations, texts and chat boards etc. It seems that many pupils and students are ahead of their teachers in using new technological devices. Staffs are often lurking behind, trying to keep up with some 25 students or pupils, when each may devote extra time to ever more complicated computer technology in their portfolios. In this field the *digital generation divide* is more evident than elsewhere, since those who should know, teachers, learn from usually less knowledgeable, their students[8].

Finnish research is ahead of Sweden in exploring digital portfolios of various kinds and will be used in this study along with American research and development. In the pioneering anthology *Portfolios on the web,* seven advantages of digital portfolios taken from current American, Australian and Finnish research is listed:

- ? More diverse documentation and richer display of competencies with multimedia and digitalisation
- ? Better means to update and monitor self-assessment, display and changes
- ? Easier ways to illustrate relationships and importance with hyperlinks and various linking systems
- ? More integrative and comprehensive forms to value and display elements from research, teaching and guidance activities as well as from actual works and products by oneself and students or pupils and from work outside the educational system
- ? Abilities to highlight various co-operation schemes and their results by hyper textual features; diverse possibilities for interaction between schools and external networks, communities and individuals, e.g. parents and friends
- ? For professionals, academics and teachers, richer possibilities to combine competencies of one's own specialist domain with pedagogy and information technology
- ? Easier ways to store, manage and process documents[9]

Not many portfolios meet all these challenges but some try. A digital web portfolio consists usually by an opening page with presentation, referred as "Home" or "Me", or "My portfolio" with a table of contents, and the contents divided into areas of competence or by other hierarchies according to the nature of the subjects included.

Not every personal homepage make a portfolio, and seldom a learning one. This cannot be emphasized enough. Digital learning portfolios may look very different in design, public statements, networks, presentation samples, comments and author, but they are learning portfolios only if they include learning processes and comments that demonstrates growth over time. Any haphazard collection of artefacts is not a portfolio, even if the presentation is smooth and well designed. This is more threatening with ICT than with paper files and folders. Of Lee Schulman's five dangers with portfolios the first "Lamination" is applicable to digital portfolios in particular.

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[8] For teaching across the generational divide, see www.ConnectedFamily.com, where MITs Seymor Papert gives suggestions to schools, communities, companies and families.
[9] P. 10- 11, in Linnakylä/Kaankaranta/Bopry (1999). This anthology is the first broad study of digital portfolios, especially its use for professionals and academics. See http://www.jyu.fi/ktl/index2.html for their research.

2.4.1 Three access levels

Parts of the web folio may be private and kept for storing samples and reflections. Others may be accessible to teachers and classmates or colleagues. And much is of course available to anyone as on the Internet. Here is a threefold categorization of levels of access that may be used in discussions for developers and teachers:

- ? A) Private area. Work in progress files and links to use when needed. Tests and assignments not of use to teachers,
- ? B) School or group area. Teachers regularly look in to view student achievements, give suggestions and comment upon reflections and state of student education according to commonly stated and personal goals. Parents with password may look in as well as classmates and school community
- ? C) Public area. Accessible from Internet or other open networks, such as an intranet for a municipality and its schools.

A) is less known of since it concerns only the student who may keep digital material stored on private webs free of charge that not is linked with any academic institutions. More likely is that school intranets serve this purpose and students and teachers benefit from common general ICT support[10].
This level is interesting to higher education too. Ongoing ICT development at Uppsala University administration will in 2001 establish student portfolios on the web with access only for the students. Course material, notes, links or whatever may be stored there within certain megabyte limits.

B) is used by many schools, for instance by *Lemshaga barnakademi*, an innovative elementary K- 9 school in Sweden with ICT support form Swedish corporations. Parents log in with passwords and discuss with their children and teachers commenting portfolios and schoolwork and issues[11].Due to legal reasons for protecting children's integrity, many schools are obliged to stay within a virtual locked classroom.

C) is difficult for its openness which both inspire and inhibit students. Some may get a kick out of the publicity, others can get nowhere with their learning when they know that it is "out in the streets". As Helen Barrett, leading expert on digital portfolio development, writes:

"It is very awkward to learn in public, especially when the written reflections show all of the hesitancies and insecurities that learners feel when forced into new learning situations where they feel less than adequate. Perhaps a learning portfolio is best stored in a private space, and shared only with colleagues. The learning portfolio has many similarities to a learning journal, with the addition of artefacts from the learning process. In my opinion these types of portfolios should be kept private"[12].

One difficult question is computer storage and navigation on both intranets and webs. Many institutions want students to gather material in a portfolio from early years to graduation. Universities emphasize life long learning which would include further storing after graduation to the expenses of the university computer budget. Students

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[10] Broady (1992)

[11] www.lemshaga.se.

[12] Barret (2001). Helen Barrett is the pioneer in digital portfolios. This study would be much less useful without her ongoing fruitful research, see http://transition.alaska.edu/www/portfolios.html.

may also need to continue their portfolios, or at least have the finished version on the Internet, in order to market their own professional knowledge in a CV with samples and ready references. Or they just want to continue their studies and contacts with other professionals, activists, members or whatever they linked to in their website. An earlier solution was CD discs which still are used at primary schools. But they are static and hard to access for others.

It is important to remember that digital learning portfolios combine two cultures and processes: education and ICT. Equal attention should be made to both since both are essential. Without learning content the portfolio becomes a superficial showcase and with poor navigation and design no one make the effort to browse through its what may be important contents behind boring lists and rubrics[13].

These questions on technology and design will be further developed in Part 4.

2.5 Digital learning portfolios in K- 12 schools
At all levels digital portfolios are explored. Primary schools are ahead of high schools. Below are some examples, mostly American.

2.5.1 Preschools
Preschool may seem far from digital endeavours but some projects actually try to document toddlers' way from crawling up until they leave preschool. At two preschools in Södertälje in Sweden, preschool teachers take pictures when digital cameras of play in- and outdoors, gatherings, developments in drawing and speech, parental communication etc. Each child gets its own portfolio file on a computer that parents can view at preschool or take home on a disc. Some pictures are put together as Power Point presentations of special themes or occasions and some have been published on Internet[14].

In Finland the researcher Marja Kankaanranta has followed digital learning portfolio projects that aim to align communication and learning from kindergarten to primary schools in graduate studies[15].

2.5.2 Primary schools
Sweden
At the small west coast village Ödsmål in Sweden several schools have started with digital learning portfolios. The school Ekenässkolan is a pioneer in digital portfolios in elementary schools starting in 1997.Their Internet site is worthwhile looking at for developing Swedish similar projects and for school reformers and scholars alike[16].

The children's personal portfolios can look like this one, Louise's, a 6 years old preschooler. She reads the alphabet out load for everyone to listen. Other materials include letters, music, art, math and play.

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[13] Barrett (2000).

[14] Interview with project leader Malin Fölster in Berg et al (2001) and her presentation at Rinkeby , Stockholm, in april 2001 for an in-service training course for preschool administrators.

[15] Kankaanranta (1998). Her dissertation Developing digital portfolios for early childhood education at Institute for Educational Research. University of Jyväskylä (Finland), is under consideration fall 2001.

[16] http://www.stenungsund.se/ekenas/portfolio/index3.html

Så här ser Louise presentationsportfolio ut.

Vi har använt programmet MultiMediaLab.

A table of required portfolio contents for 5 graders is clipped out below, showing the subjects and activities in Swedish and placed on a hard disc drive in regular Windows folders:

A girl shows her work easily to several teachers at one time with digital learning portfolios at Ekenässkolan.

The learning portfolio project at Ekenäskolan have been supported for three semesters by The Knowledge Foundation (KK-stiftelsen) and evaluated by The National Agency for Education (Skolverket). The results show that communication with parents became better, metacognitive thinking helped pupils to take responsibility for their learning, technical development in ICT sparked new innovations and presentations in the portfolios and teaching became more related to the pupils' needs[17]. Drawbacks were lack of time, especially for the younger children's documentation work and trouble with computer technology.

Now in 2001, each classroom has three computers connected to local networks and Internet. Each student that leaves Ekenäskolan will have all schoolwork documented on a CD. The school has been in media focus for its pioneering digital portfolio projects and keep developing their own style of Swedish digital portfolio work in classrooms[18].

USA

Digital learning portfolios in primary schools are quite frequent. They are a part of the mid 1990s explosion of Internet school projects committed to mail exchange, international discussions between schools and nations etc. Portfolios became an natural part of that development.

American digital learning portfolios and Internet projects are often very well designed and creative, such as a project outside New York. Two elementary school teachers supported by New York State started a school initiative with class home pages, link lists, portfolios from 1st grade and much more[19]:

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[17]Henningsson- Yousif (1999) and Skolverket (1998). See also www.stenungsund.se/stenung/Miklagard/itis1.htmfor a commentary of the receiving junior high school to which Ekenäskolan's pupils went with the digital experiences and their CDs.

[18] Go to http://www.skolporten.com/arkiv/view.asp?id=2106, for recent Swedish digital portfolio updates and http://www.vxut.kronoberg.se, go to Skollänkar and then Portfolio.

[19] http://comsewogue.k12.ny.us/~ssilverman/class99/index.html. The well-experienced primary school teacher behind this sitee turned instructional technology teacher, http://www.comsewogue.k12.ny.us/~ssilverman/2000/

Every child has its own portfolio. This one is Joseph's, a 2nd grader that demonstrates what he knows in geometry:
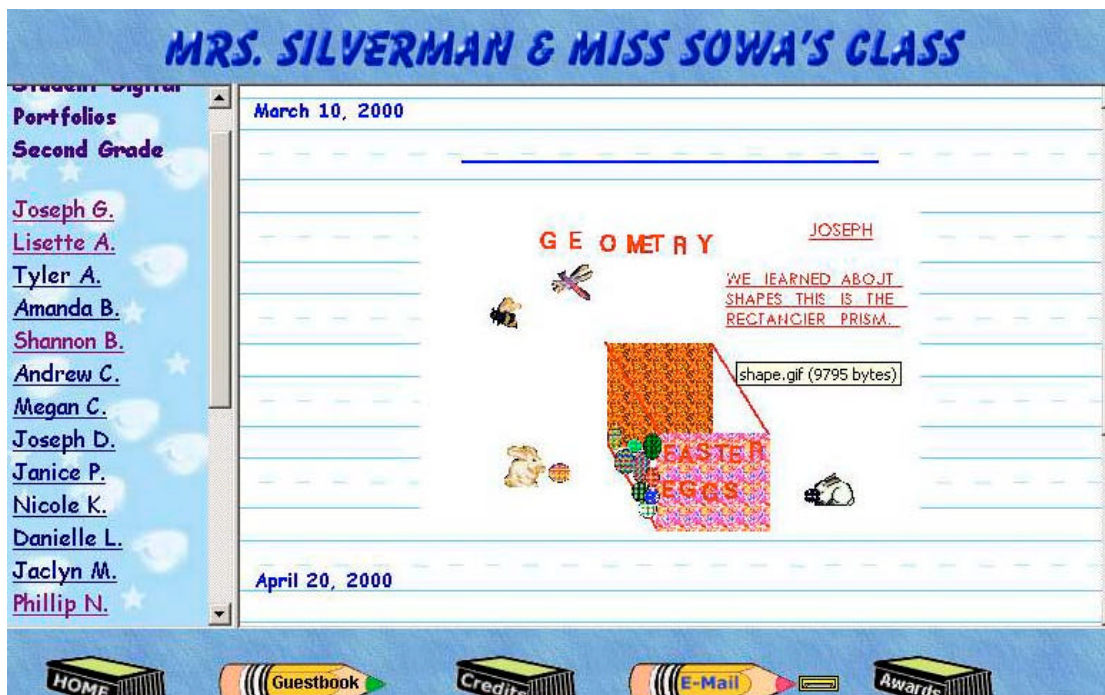
Primary schools are often experimenting with design and use the children's drawings as backgrounds.

2.5.3. High schools

New York State

David Niguidula, an educational consultant and pioneer in digital learning portfolio development, supervised six school projects from 1993- 1997 in New York State with good results in spite of lack of computer skilled personnel and quality network equipment[20]. Portfolios were a part of initiating school reforms and its technical use less in focus.

With a "roundtable" talk every Friday at one of the six schools (University Heights High School, Bronx), pupils show what they have learned and why they should go on to further levels. Standards relate to the school's work with seven *Domains and Habits of Learning:*

- ? Communicating, crafting and reflecting
- ? Knowing and respecting myself and others
- ? Connecting the past, present and future
- ? Thinking critically and questioning
- ? Valuing and ethical decision making
- ? Taking responsibility for myself and my community
- ? Working together and resolving conflicts

Students are required to collect samples in each domain in order to advance in their studies. At the roundtable, teachers give responses, "cool" and "warm". Samples are prepared in "family groups" of students and have been assessed by a teacher before the roundtable discussions[21].

Alaska

Todd Bergman, another innovative pioneer in digital portfolio publishing and an educationalist, made another successful high school project with digital learning portfolios in late 1990s at Mt. Edgecumbe High School in Alaska.[22]. The student portfolios seemed to help to articulate the culture of Native Americans and inhabitants of Alaska in a new way. Students appreciated the portfolio possibilities to make a digital networked community with family and friends.

This is an example of one high school student's portfolio:

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[20] www.essentialschools.org/pubs/exhib_schdes/dp/dpframe.htm and Niguidula (1997)

[21] One example at http://www.essentialschools.org/pubs/exhib_schdes/dp/uhhsport/home.htm

[22] The portfolio project and student portfolios is reached at www.mehs.educ.state.ak.us/portfolios/portfolio.html . The "Strategic considerations for digital portfolios" is taken from Todd Bergman's article "Networking for the self-directed learner in the digital age" which appears in Linnakylä/Kaankaranta/Bopry (1999)as well as on the high school web site.
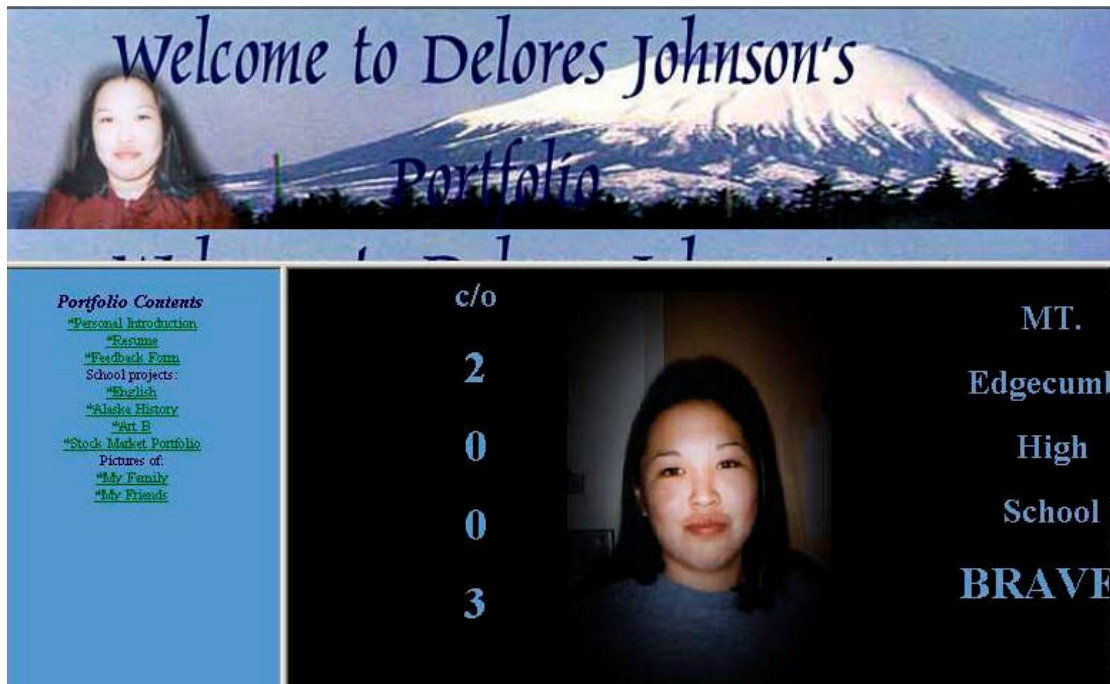
Todd Bergman wrote a checklist after working with the project for a while. Most items seem self-evident after the preceding discussions on digital learning portfolio development in this study, but many newcomers may still face these problems. Some problems are still too far away even for experienced digital portfolio projects, such as no 3:

Strategic questions when developing a digital learning portfolio

1) The portfolio should be learner-centered; that is, a framework enabling each learner to access a common electronic platform to create and continuously improve a personal portfolio. (please note that teachers and administrators can/should be able to access some areas of student portfolios for the purposes of assessment). This access platform should not be software specific.

2) The portfolio should be accessible by all learner stakeholders: teachers, parents, prospective evaluators, etc. (please note that some areas of a personal portfolio can/should be protected with an electronic key)

3) Maintenance, additions and deletions to learner portfolio should require minimal teacher or supervisory time.

4) The digital portfolio should facilitate the easy capture, storage, display and retrieval and deletion of any/all information and materials that are to be included.

5) The portfolio should be cross-platform, accessible via Mac or Windows or other Internet environments.

6) The portfolio should accommodate automatic updating of fluid (non-static) records (i.e. student transcripts, records, etc.).

7) The portfolio should be easily portable or transferable to other electronic systems or intranets via storage devices or electronic transfer technologies (can it be emailed?).

8) The digital portfolio should have a simple user interface (it should be user friendly for all stakeholders). The portfolio should be able to be accessed and viewed without specific sets of directions or lessons.

9) The portfolio should have the capacity accommodate multiple forms of electronic multimedia: static text and graphic displays, databases, audio bites, video clips, panoramic files, object oriented (three-dimensional) files, virtual reality, etc.

10) The electronic portfolio platform should be able to accommodate the integration of existing software files, which are representative of individual capacities and assets. This is especially important given the great variety of software and computer capacities known to us."

He emphasizes portfolio accessibility and modularisation of its contents, e.g. being able to move, store and change without trouble. These questions may seem not of interest to teachers but later technical discussion in Part 4 will show that it is central to long term quality portfolio development.

This Alaskan school established its own standard with optional and mandatory items to be included in the students' portfolio," Baseline Requirements for all portfolios--hardcopy and electronic". For details see Appendix 1.

2.6 Student digital learning portfolios

University students also produce digital portfolios of course and will mentioned here, but teacher students' digital portfolios will be considered in the next part. University students' learning portfolios are probably the most common kind of portfolios, digital and otherwise[23]. Portfolios can connect knowledge of a certain field, a major for instance, in ways that interconnect all kinds of knowledge and activities, personal, academic, professional. Although students develop their portfolios individually, in the process of doing so, they often engage in a learning community of peers, faculty, mentors and learning resources.

With digital tools, students learning various professional proficiencies, skills and knowledge may be benefited from displaying and evaluating their professional knowledge in a digital learning portfolio. The practical aspects of higher education professional programs, e.g. what veterinaries, teachers and technicians need to know and do, are easier evaluated when being filmed, recorded and sampled in portfolio than tests of theoretical knowledge. This aims very well with the advantages stated in *Portfolios on the web* concerning diverse documentation and richer display of competencies with multimedia and digitalisation.

Many schools and higher education institutions use learning portfolios for assessment purposes. Assessment questions will be brought up later in the parts on standards, and assessment. Other purposes for digital portfolios are also interesting, keeping track of ways of learning and coherence in studies. Two student projects at Stanford and

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[23] A database of digital portfolios owned by American Association for Higher Education is available at http://www.aahe.org .

Swedish Learning Labs will be considered below on these matters, the Learning Careers Project and Folio thinking.[24]

2.6.1 Learning Careers Project at Stanford

This project focuses not on assessment but what may happen during four years with students' learning careers and formations as professionals or academics, within the context of living and studying.

Little is known about how students acquire, maintain and employ the knowledge and skills they accumulate over the course of their college years. This longitudinal study aim to trace how students construct their skills and choose careers, what formal and informal resources they use for learning, which aspects of their education and time spent at Stanford are most significant etc.

The end result will be a personalized digital record of the students' learning experiences. On going research show that the project and its software tool E-folio™ must be implemented at Stanford University at large so faculty members across disciplines endorse its purposes[25].

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[24] For information of the Learning Labs, see www.wgln.net, www.learninglab.uu.se, and http://sll.stanford.edu

[25] P. 1, Chen (1998). Outline of project, http://sll.stanford.edu/projects/hlc/.

The project has evolved since, as can be seen from these "Lessons learned" from the first three years of the project Stanford Learning Lab, 1997 – 2000. "For example, the longitudinal Learning Careers study showed that students could benefit greatly from personal portfolios. These portfolios could be put profitably to use in a wide variety of settings, such as distance learning, undergraduate advising, and career planning. However, implementing learning portfolios would depend on buy-in from administrators and programs across the campus, including undergraduate advising, academic departments, overseas studies, and others. The development of E-Folio™, the portfolio software tool, is a large effort and will take a significant investment in time, money, and research that would be most beneficial as part of a campus-wide initiative. Therefore, the Lab's findings on meaningful learning at Stanford depend, in part, on the willingness and the ability of Stanford programs, organizations, and their administrators to adopt and integrate the innovative pedagogies the tools are designed to support." Available at http://sll.stanford.edu/about_us/lessons.shtml

2.6.2 Folio thinking at Uppsala, Stockholm and Stanford
This project will use digital portfolios to solve social and curricular student problems in higher education.

"This project strives to solve the problem of 'fragmentation of purpose' within the student populations of Sweden and the United States. The term 'fragmentation of purpose' refers to the notion that faculty and academic advisors increasingly feel that the 21st Century student experience lacks coherence. The problem of coherence can be traced to a lack of individual student attention by professors and advisors, and is exacerbated by increased use of large lecture classes and the broadening of selection of majors and courses offered student"[26].

This fragmentation is a result of large student populations but not only. University studies for professions often lack coherent structures. In teacher education, agricultural, health and technological fields of study and training, student often meet many different departments, learning cultures and goals. In addition to this, students are obliged to make field and training experiences at schools, hospitals, work shops and farm, all different in some aspects from one another. Seldom can higher education provide enough coherence for the students various experiences. Portfolios can better abridge these differences it is hoped in this project as well as in other similar portfolio initiatives in higher education.

2.7 Professional digital portfolios
Another fast developing and spreading using digital portfolios are professionals of all kinds. Since artists, architects, journalists, photographers etc. before used their "employment portfolios", the step to using portfolio showing skills and knowledge was not far away for other professions to follow. Both inside and outside higher education, professionals try to show what they know, learn and can do with digitalization. Examples abound, especially in ICT related business and career centres.

Professionals can use digital portfolios for reasons stated earlier by the Finnish researchers.

- ? More integrative and comprehensive forms to value and display elements from research, teaching and guidance activities as well as from actual works and products by oneself and students or pupils and from work outside the educational system

- ? For professionals, academics and teachers, richer possibilities to combine competencies of one's own specialist domain with pedagogy and information technology [27].

Digital portfolios are better instruments to display various competencies for pupils, students as well as for professionals using diverse media. Expert knowledge is seldom restricted to just one person's head or hands, but characterized by interaction between

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[26] From "Letter of intent" in Feb 2001 to the WGLN Learning Lab Directors from Uppsala, Stanford and KTH Learning Lab. The project Folio thinking will be launched at Stanford university, Royal Institute of Technology at Stockholm and Uppsala university at Dept of Teacher Education.
[27] For professional digital portfolios, see Pirjo Linnakylä'sand Marja Kaankaranta's contribution in Linnakylä/Kaankaranta/Bopry (1999)

people, communities and networks. This is better accomplished with digital presentation where links enable viewers to follow up one's professional directions. It is also a very good place to evaluate oneself and keep up a life-long learning perspective.

Not to forget, digital portfolios themselves show expert skills and practices with regard to information technology and visual presentation." Furthermore, it also gives the experts a chance to show their aesthetic and creative capabilities for visualizing and presenting knowledge as well as for reflecting and self-evaluating the development of expertise"[28]. An in-depth investigation of four professional portfolios by a Finnish musician, an American multimedia designer, a Finnish educational consultant and an American architect show that national cultural contexts are important.

"…For a Finn, many American expert portfolios seem surprisingly open and cooperative. Apart from references to various awards and prizes they often include praising feedback from various interest groups – from students, friends, colleagues, superiors, customers – and emotional recommendations by teachers and supporters. In the Finnish academic life the socio- emotional climate seems to be somewhat cooler"[29].

They also note that some professional digital portfolios still have long texts that make it impossible to read without printing. Many features of the web and multimedia technology are not taken into advantage of yet, the study made in1998 noticed. Many experts are not familiar with structuring their knowledge and networks well.

Graduate students in another Finnish research project evaluated various professional digital portfolios and concluded: "Only a few portfolios were evidently designed for web readers". [30]

2.8 Life-long learning digital portfolios
Students become professionals after graduation and some never think back on their learning experiences. But some professionals want to keep on learning, go into new learning communities while keeping contact with their alma mater. They benefit very much from digital portfolio development, but probably make them more like personal web pages. They are not organized as well as students and (some) professionals, with whom they have a lot in common. Life –long learners are centered around they own learning development, and less around career and presenting nice CVs.

However, ideas and tools to support advanced digital portfolios for life-long learners do exist. The project E-PAL (Electronic Portfolios and Autonomous Learning) initiated by the Stoas Corporation in the Netherlands and submitted to the EU Commission in 2001 is devoted to reflecting life long learning in multipurpose electronic portfolios

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[28] Op cit, p. 218,

[29] Op cit, p 239. For another national perspective, Australian, see chapter 3 in op cit and Hartnell – Young/Morris (1999). The last book is an introduction and practical handbook for making digital professional portfolios. Related Australian material with emphasis on teachers' portfolio available at http://www.cuttingedge.rmit.edu.au and http://www.results.aust.com/Ecowan.htm

[30] P. 19 in Linnakylä (2000). The evaluation was made in June 1999.

"Ideally creating and maintaining electronic portfolios will motivate students to learn in a more active way as they can store and display their results. This can be achieved better if students feel that their electronic portfolios are valuable in life and not just something required by teachers in a limited phase of education. Electronic portfolios can become more valuable in lifetime perspective if they:

1. supply prove of competencies to potential employers
2. supply prove of quality for potential customers with regard to services supplied by, or products made by the person described in the portfolio
3. document personal growth in life on the web; many people feel the need to show parts of their life to themselves, their relatives, friends and the world in the form of personal web pages. Not everyone has this need, but those who have often show a strong motivation in doing this, and it is likely that these people have a strong intrinsic motivation to maintain an electronic portfolio as well. Moreover if ad hoc created personal homepages contain parts showing personal growth and proving competencies than those parts might be regarded as an electronic portfolio.

Combining several or all these functions into one lifetime electronic portfolio might bring motivation during education, eliminate the need of building a series of different portfolios in lifetime and support longer term reflection"[31].

The project aims to develop a standardized international qualification and competency database of electronic portfolios, a very hard task that needs consideration initially I believe.

2.9 Summary
Digital learning portfolios serve many purposes at all levels in educational system:

- ? assessment and evaluation,
- ? showing creativity and progress
- ? bringing coherence to diversified (professional) studies
- ? tracking learning experiences
- ? helping children, students and teacher to keep up with contemporary computer technology.
- ? showing learning processes to external stakeholders

There are many sorts of portfolios and digital ones are also diverse as the brief inventory of K- 12, student and professional kinds show. Levels of access are important for stakeholders viewing the portfolios but legal aspects and student integrity must be respected. None of the mentioned digital learning portfolios has considered qualified methods for organizing contents such as metadata technology. They all belong to the first generation of web portfolios built on regular Html coding and nice design but lack stability and access through navigation according to contents rather than appearance. More on this in part 4.

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[31] Memo from Emiel van Pufflen, Stoas corporation, Wageningen, Netherlands, 2001. http://www.stoas.nl. Members in the E-Pal project besides Stoas: Dept of teacher education at Uppsala university, SLU-kontakt at Swedish agricultural university (Uppsala), Department of teacher education at Malmö university college, Bundesinstitut für Berufsbildung in Bonn, Germany and the CITO group, Arnhem, Netherlands.

Part 3 Digital learning portfolios in teacher education

3. 1 Overview of learning portfolios in teaching

Learning portfolios came first through the art field into education and teaching, naturally. Art students as well as art teacher students made show case portfolios. But they included no reflections on the artwork. Just nice scrapbooks like artists themselves had. This changed though when evaluation got more structured and the number of students increased:

"Later, for assessment purposes, art students who turned in their portfolios for grades had to be very selective about which pieces they put into their portfolios and they also had to write or narrate some kind of reflection about why the pieces were included in their collections"[32].

The next field for using learning portfolios in higher education was English and language arts.The concept of writing process became a time saver for teachers in schools and universities as well as for teacher educators. The concept "teaching portfolio" became a certain kind of learning portfolio for teachers, teacher students and eventually in 1994 a definition was proposed by Lee Schulman:

"A teaching portfolio is the structured documentary history of a (carefully selected) set of coached or mentored accomplishments substantiated by samples of student work and fully realized only through reflective writing, deliberation and serious conversation" [33].

Teaching portfolios may be considered from four perspectives: for credentials purposes, for showing assumptions about teaching and learning , as a possibility for self-reflection and learning experiences and as a working tool[34]. These divisions are worthwhile considering when analysing digital portfolios in teacher education.

Perspectives may conflict. A teaching portfolio is highly personalized portrait of someone and his or her professional development it can involve a risk to show to others sides of a personal life that do not necessarily fit with the teaching. This may happen to all kinds of portfolios, but teachers often relate to stakeholders in such a direct way. Their pupils/ students may have very definite ideas of their teacher that the portfolio does not show, or even contradict.

3.2. Learning portfolios in teacher education

Since the focus in this study is on portfolios in teacher education, a more elaborate section will follow on their specific features here, continuing in next section with digital forms.

In USA, learning portfolios "have assumed a significant role in teacher education" according to the editor of a special issue on portfolios of *Teacher Education Quarterly*[35]. In a survey of 127 teacher educators 92 per cent stated that "portfolios

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[32] P. 4 in Wyatt III/ Sandra Looper (1999).
[33] Quoted at p 3 in Lyons ed. (1998).
[34] Op cit, p 4.
[35] *Teacher Education Quarterly (1998)*. Quoted at p.4 in Piper (1999).

had a positive impact on pre service teachers because portfolios were student-centered, defined by professional standards and reflective/. . . / self- empowering tools that encourage pre service teachers to assume a responsibility for their learning"[36].

Teacher educators have an opportunity to work in three parallel processes; their own portfolios, the teacher students' and the pupils' portfolios. It is recommended to have one's own portfolio as a teacher and teacher educator, being more truthful and reliable with portfolio engagement. Therefore, make your own portfolio at first. Without own experiences, portfolio assessment and development become no more than talk.

The best way then to start according to two well-experienced teacher educators is to show students the teachers' own portfolios, but not former student portfolios[37]. Complete student portfolios may get new students the impression that they should look a certain way and contain certain pieces. The teacher educators want to support many different kinds of portfolios, all reaching the same goals. They show bits of rationale statements and samples from other students however.

Students then get an assignment to state a personal reading and writing goal and start a brainstorming discussion of how to show evidence supporting the goals in a portfolio. Creating self-reflection is made by various assignments and exercises. The students also get to formulate descriptors on four grades; exceptional, thorough, adequate and inadequate. See appendix 2 for examples of grading descriptors developed by students themselves in collaboration with the teacher educators.

Then a "Portfolio Planner" is used which look much like the ones in primary schools with blank spaces for Goals, Evidences and its Relationship to Goals. This Planner serves purposes of organization and reasoning, and as the basis for planning conferences. Portfolio conferences occur about twice a semester and are preceded by peer and self-reflective group discussions. Teacher students were according to a survey initially negative about portfolio assessment (84% of elementary school student teachers, 70 % of secondary school student teachers), but at the end almost everybody was satisfied and positive (98 % of elementary students, 89 % of secondary students). One negative remark pointed to the kernel of portfolio work, and a student did not appreciate it at all:

"I also found it annoying that I had to prove my knowledge and come up with a way of proving it "[38]

An important factor in teacher education is the need to align university studies of teaching and subjects with practical teaching and schoolwork. Creating portfolios may have good effects on the sometimes-hard transition to classrooms and schools. Portfolios show what the student has learned and how he or she thinks about it, validates the credibility of teacher education and theoretical studies and, hopefully, increases the student's self-confidence.

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[36] Andersen, R.S. and DeMeulle, L "Portfolio use in 24 teacher education programs", in *Teacher Education Quarterly,* quoted at p 5 in Piper (1999).
[37] P. 25- 26 et passim,in McLaughlin/Vogt (1996).
[38] P. 76, op cit.

When students teach and are obliged to get evidences from pupils, classrooms, colleagues etc they have to evaluate themselves openly. Showing their knowledge and skills, they extend their knowledge and skills to comprise both university and school experiences and studies. As with other parts of the portfolio, the student teaching is also based on the portfolio owner's goals. Instructional planning, teaching performance, classroom management etc are often the focus of such goals, which easily involve teachers supervising the student at school to discuss the portfolio contents and development.

Questions of university regulations, grading and admissions based on portfolios are obstacles that may hamper portfolio development however. But when well structured and based on long experiences, many higher institutions grant portfolio evaluation the same criteria as tests. Eight steps to develop portfolio assessment at the university level are proposed:

1. Recognize the importance of curricular, instructional, assessment and evaluation alignment
2. Develop course goals
3. Create authentic performance indicators
4. Incorporate flexibility
5. Develop criteria for evaluation
6. Correlate the evaluation with the university grading system
7. Manage the process
8. Use assessment results[39]

Crucial for success in implementing portfolio for evaluation purposes in higher education is, besides administrative barriers, time. Enough time to learn new assessment innovations, hold conferences with students, give feedback, align students' portfolios with the grading system and all administrative work that needs to be done when changing organizations.

3.2.1 American standards
A way to persuade universities and teacher colleges to take portfolios seriously is to use institutionalised standards; state, interstate or federal. One should be aware of that the US do not have a national curriculum nor a national examination system. Education is primarily a state responsibility.

Requirements differ then of course for teaching/ teacher education portfolios and for showing proofs of teaching credentials or teacher education. Some institutions require teachers to verify that they have certain competencies in a portfolio before being hired as in Oklahoma for instance.

In the *Oklahoma General Competencies for Teacher Licensure and Certification of 1997* 15 specific competencies are needed. Here is one:

"No 12: The teacher understands the process of continuous lifelong learning, the concept of making learning enjoyable and the need to a willingness to change when the change leads to greater student learning and development "

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[39] P. 28, op cit.

See Appendix 3 for all 15 competencies from Oklahoma.

Another American important standard for evaluating teacher students and teachers is the *Interstate new Teacher Assessment and Support Consortium* (INTASC). It is an alliance of states for the renewal of beginning teachers' certification and licensure Their ten standards align with standards from professional teaching organisation. Here is standard principle no 7:

Principle #7:The teacher plans instruction based upon knowledge of subject matter, students, the community, and curriculum goals.

See appendix 4 for the INTASC standards.

The *National Board for Professional Teaching Standards* (NBPTS) requires very specific assessment items from prospective teachers. The early childhood teacher must include five portfolio entries such as

"3. Engaging children in science learning: teachers are asked to highlight an investigation of a science concept. Written commentaries as well as a videotape segment are to be included" [40].

See appendix 5 for all NBPTS' approved portfolio entries

Standards may conflict with personal ambitions in making a learning portfolio.

"Is this for my growth as a student teacher or is this for the program's purposes to say to the state 'Yeah, these guys should get a credential ' ?", one student asked an institution for teacher education[41]. The program responded by creating two portfolios; one for credentials according to state standards and one for documenting learning processes and evaluation for a M.Ed program.

3.2.2 Portfolio contents for teacher education
Lists of what may be included in a student teacher and/ or teacher portfolio are welcomed by teachers eager to start and many suggestions are proposed. Here is one from INTASC:

1. Introductory letter.
2. Table of contents
3. Résumé.
4. Transcript.
5. Formal evaluations.
   - ? Clinical teaching experiences
   - ? Student teaching
   - ? Self-evaluation / reflection
   - ? Supervising teacher
   - ? Administrator (if experienced teacher)

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[40] P. 35, op cit

[41] P. 124, in Lyons ed (1998).See chapter 8 for the dual solution with two portfolios.

6. Philosophies
- ? Teaching
- ? Discipline/ classroom management
- ? Parent involvement
- ? Assessment
- ? Multicultural

7. Letters of recommendation
8. Competencies or standards
9. Videotape of teaching
10. Personal accomplishments/ autobiography
11. Student work samples [42]

All portfolio guides for teacher education mentioned in this study have several sets of contents, which are worthwhile considering when establishing a portfolio initiative in teacher education. There is not one single manual to portfolio development. Each specific kind should be established according to its context.

3.2.2 Stockholm School of Education portfolio project
In Sweden, the Stockholm School of Education has since mid 1990s tried to implement portfolio evaluation and thinking in the arts and communication field[43]. With students required to gather items of reading and process logbooks, protocols from group meetings, commentary to study visits, collegial responses and a self-evaluation, it had a promising start.

Due to lack of adequate time for teachers to supervise the portfolios and hold effective portfolio conferences and administrative and student unfamiliarity with the new form of evaluation not everybody was satisfied. A survey on the portfolio evaluation project in 1996 got these figures

5 % very bad
15 % pretty bad
45 % pretty good
24 % very good
11 % did not know[44]

(later surveys showed improved success, see below)

Student and teacher responses tell of the problematic start. A student writes that continuous follow-up

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[42] P. 38 in Wyatt/Looper (1998).Other possible contents from oneself (22 pieces), from others (6), products of excellent teaching at p. 40 – 42.
[43] Lindström (1998) and Lindström (1997). A study guide and checklist for portfolio examination ais still in use at Stockholm School of Education. Portfolios in teaching Swedish as a second language at http://www.lhs.se/sfi/portfolio.htm. Digital portfolios are used in the education of recreation instructors at Stockholm School of Education.
For evaluation of music teacher education, see Ulla Wiklund (1996).
[44] P. 43, in Lindström (1997). Student commentaries p. 44- 50. Translation mine/JS.

"would have been fine and exciting but in reality almost impossible. We have only met with our supervisor a few times. It would make very high expectations on him or her. It is enough to read and go through as it is, with 26 portfolios only in our class".

and the teacher seem to fill in writing that

"a lot of work has been put down in the portfolios by the students and for me as an examining teacher is also a very hard job to read through and write commentaries to each student".

Positive responses talk about how "fun working in this manner. Many advantages. No final exam at one time, but a process over time and one has viewed how the portfolio has grown"

A willingness to take responsibility for learning is common in the positive feedbacks, but all need more responses from colleagues and teachers. Another positive student feedback concerned the possibilities for reflection and taking individual standpoints.

Stockholm School of Education continues with the portfolio evaluation project and have far better figures in surveys 1998 and later. 90 per cent find the portfolio work good or very good, find it useful for teaching profession and good for personal development.

3.3.Teachers' digital portfolios
Australian women teachers have since mid 1990s developed a digital portfolio project "Women@the cutting edge" that have so far led to institutionalized support for teachers to make digital portfolios [45].

Otherwise USA has most teachers wanting to show their excellence in teaching using Internet. There are teaching portfolios with standards, without mentioning them at all and some personal web pages that show teaching alongside with personal life style.

Here is an elementary school teacher looking for a position with her portfolio, showing her abilities related to standards[46].

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[45] See footnote 19.
[46] http://durak.org/kathy/portfolio/index.html

This is how a college teacher in English wants to present himself not mentioning standards[47].

When I Teach

My personal teaching philosophy and mission statement

Despite its name, English is more than the study of this or any other language. It is more than spelling or punctuation, process writing or the writing process. It is more than books and literature, and more than communication, media, or rhetoric. Yes, English is these things, it contains them, but it expands far beyond.

When I teach, I do not teach simply to convey a limited set of information, but to mold manners of thought. I

For another sample of a university teacher's digital learning portfolio with written responses from students, self- evaluation, see appendix 6. It shows many statements of her professional life that show extraordinary openness and striving towards better teaching.

3.4 Digital learning portfolios in teacher education
The step over to using digital learning portfolios in teacher education is crucial to provide future teachers with knowledge of learning technologies many American institutions in higher education believe. European teacher education is at this time (fall 2001) somewhat behind this willingness to explore technological opportunities even if there are exceptions in Northern Europe[48]. 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.

Of course other solutions to implement ICT in teacher education are possible. ICT in teacher education at large is presently under discussion whether ICT should be taught in separate courses or integrated in all subjects and headings[49]. Portfolios containing samples and showing evidence of cross curricular teaching and learning in digital forms may be what could knit the teacher students' experiences together.

However, digital portfolios are still new in classrooms in schools, teachers' colleges and departments of teacher education. Many teacher students as well as all kinds of teachers feel inadequate using computers in classrooms and some feel ICT as a threat[50]. A reluctant tradition among teachers and in the teachers' staff rooms towards new technologies and innovations prevails though.

Teacher educators themselves should not continue this traditional scepticism, American authorities in higher educations claims, rather the opposite:

"Perhaps the best way the faculty can inspire teachers-in-training to use technology is to cast themselves as learners and to experiment fearlessly in the applications of technology. The teacher education faculty can make themselves role models of lifelong learning if they create for themselves situations in which they must learn from each other and from their students."[51]

These samples from teacher education in USA show various kinds of web-based portfolios.

Showing Florida state *"Accomplished Practice #2 - Communication - Use effective communication techniques with students and other stakeholders",* this student is speaking directly on a video (quick time) clip[52]:

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[48] Besides Finland, Holland is currently exploring web portfolios in teacher education. See http://Education1.edte.utwente.nl and http://portfolioinfo.efa.nl/uk/index.html. Yahoo search in July 2001 got 13 hints in Sweden for "Portfolio And Lärarutbildning AND Elektronisk", mainly at small teacher colleges.
[49] P.10 in Polonoli (2000). Short version available at http://www.wvnet.edu/conf2000/digiport.htm
[50] Jedeskog (2000)
[51] National Council for Accreditation of Teacher Education (1997).
[52] http://www.ep.coe.ufl.edu/2000/zoch-patrick/index.htm

Rationale: I chose to use this video clip as an illustration because it illustrates my ability to spark critical conversation within the classroom on a specific topic through the use of good probing or initiating questions. In this clip is of a Socratic seminar where I act as facilitator to sustain momentum in the seminar's discourse.

Socratic Seminar (I'm closest and ask the lead-off question) 1MB

Click this link to view other Quicktime clips of my instruction

Here is another student reflecting on a common teacher task, grading papers[53]

Reflections On Homework

May 14

I have been grading journals almost all weekend. I am realizing that this is not going to work if I am going to be a teacher. It takes so much time! But at the same time, there are positives too:

For Journals
Keeps students work
Running log
Reference
Gives students ownership
No daily homework correcting
Less likely to throw away work

Against
Grading a hassle
No daily turned in work
Students forget to include some papers
Students forget to bring journals
Stamping a hassle

So if I decide not to do journals, I guess I would either create worksheets (not going to work next year because we will have a class set of CMP) or have them turn in separate sheets of paper. Daily turned in work would also give me a chance to check out the misconceptions that may need to be addressed. Or I could just stamp them with no turn in, but that is going too far I think.

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[53] http://www.geocities.com/rohashi/

Another student teacher published a personal but also professional reflection:

"On the last day of my May teaching experience, I got a very pointed comment from a very difficult student about classroom management. She might have been writing about herself for she was quick to take advantage of my leniency. She reminded me that I needed to be more proactive and consistent in my approach to managing students, and I know I did a better job during my full-time teaching the next fall." Here is the note! [54]
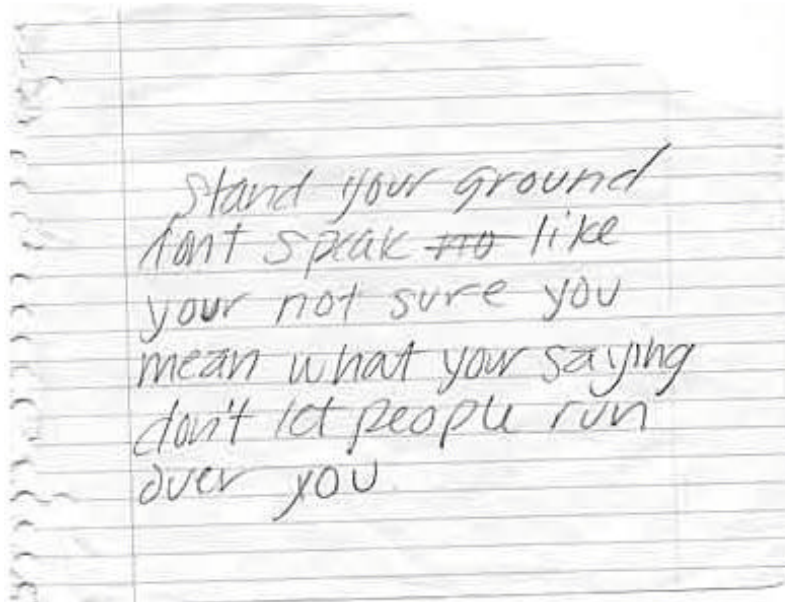
And here some Dutch counterparts with ready template functions at top, but space for personal design below[55]:

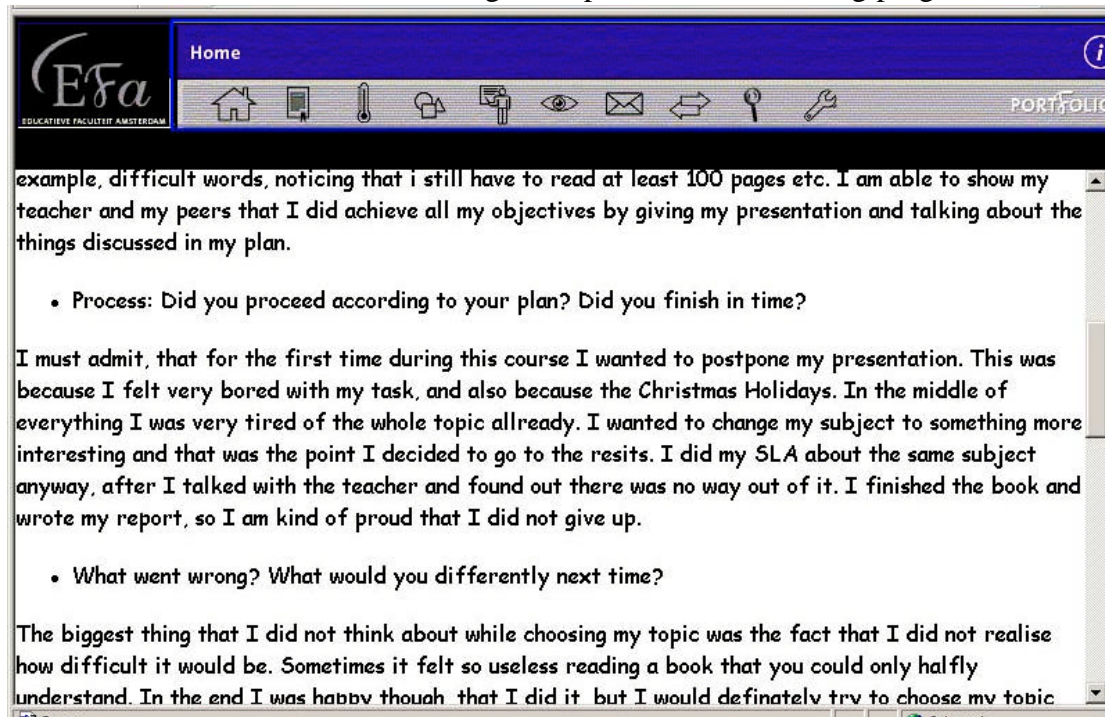The Dutch students have to write Progress reports on their learning progress:

These digital learning portfolios need to be investigated each according to the ambitions and credentials in the teacher education program and what the students themselves write in what they want to accomplish. A purpose that is beyond this study. Some diversity and creativity is show at least.

3.4.1 Portfolios in the Swedish course Learning and ICT
In 2000 and 2001 a full time semester course on "Lärande och IKT" (Learning and ICT, LICT below) at Department of teacher education at Uppsala University used digital learning portfolios.

The aim of LICT was to enable future teachers to use ICT well enough to make web pages, develop school projects, and make decisions about education and ICT. Many did not have much ICT knowledge at all before this intensive course began. Besides developing portfolios, the students had to make a project in a school with children and/or teachers and to make a small-scale web portal with different functions, easy navigation, updated news and information. The students worked in teams with several projects taking responsibilities themselves for running many administrative and learning functions with a greater degree of freedom than usual in a university course. Many students liked the hard pressure that evolved when learning quality soft ware applications and having a professional designer as a teacher in web design.

The students were required to construct web portfolios with professional software programs such as the graphic editing programs Photoshop and Illustrator, web editing program Dream weaver and animation program Flash. A fourth of the course was at the computer labs of the Department of information technology which secured enough technical knowledge of networks, Html coding and hardware. At the department of teacher education each student got a computer 24 hrs/day, seven days/week for four months.

The portfolio contents were specified, e.g. book reviews, weekly self reflective log books, a final self evaluation, papers on ICT and education, lecture notes and samples from each software program but navigation, structure, form and design was up to the students' own creativity[56]. No other examination was mandatory but the portfolios.

According to a survey on using portfolio presented to both student batches digital learning portfolios was a success. See appendix 7 for the survey. Most students liked the freedom to create a portfolio without templates and standards, even if a small number wanted more guidance. As an exercise, portfolio building on the web became the place where small creations out of the soft ware products were exposed. But it seems that learning the programs was heavy and time consuming. Less time was spent on developing the written contents.

Hanna's portfolio with nice design and navigation[57]

Developing good looking and interesting portfolios became important on the web since everybody outside the department could see them. Corporations, schools, communities, municipal learning organizations etc. were also engaged around the course so students felt the pressure from stakeholders outside. LICT ended with a public presentation for an external audience where the students demonstrated their knowledge in software applications, portfolios, school projects etc.

Voices from the survey:

Advantages of digital portfolios:

"I am convinced that work published on the net motivates and sharpens performance. Furthermore there's the feeling of a natural target group, something leading to meaningfulness."

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[56] Version 2000 at http://elwa.ilu.uu.se/2000/ and version 2001 at http://elwa.ilu.uu.se
[57] http://elwa.ilu.uu.se/2001/student/html/portfolio/hannar/index.htm

Most instructive is the "process from thought to final result. You have been obliged all the time to live with the work in order to get all threads together. It has been stimulating and instructive", one student wrote.

Disadvantages:

"The portfolio is only related to this course. If I had done a new portfolio today it would have been more related to me as a person. This course would only be a part of the portfolio which would include more form earlier courses and a CV ".

"It takes enormous time to sit by the computer. Portfolios would probably be very large if everything from all study years should be collected

Learning processes:
"It may be a relief that when things go wrong to look back on your work and see that you has actually developed".

The best is being able "to see your development. Discover that you learn things. You compare with yourself instead with others"

"To collect things in a natural way and maybe only the best ones. If the portfolio follows you during the greater part of school time the pupils get a clear overview of their production. The work does not feel worthless if the pupils learn from the beginning to save their work for a specific purpose and for their own sake. When pupil and teacher together decides what to save in the portfolio self-evaluation comes naturally"

Johanna's portfolio with a sober graphic style [58]

Portfolio visibility on Internet:

Most instructive has been "building a net personality. Your portfolio mirrors who you are and you have created that image yourself."

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[58] http://elwa.ilu.uu.se/2000/student/portfolj/johanna/html/index.html

"It has been hampering to my writing"

A pertinent student wrote though:

"Have we really made a portfolio?"

The answer is Yes, a prototype portfolio enough for examination of one semester, but not a real learning portfolio. The portfolio methodology developed out of practice in course and lacked a coherent structure with regular conferences, criteria and learning scaffolds. Since the course focused on ICT in itself, portfolios were only regarded important showing ICT skills, not developing other much other kinds of knowledge besides using ICT. Many students would have liked to make a portfolio from starting their teacher education program. They also claim that knowledge of portfolio methodology in general is lacking at the department.

Students complained also on lack of instruction in portfolio thinking and supervision. Nevertheless, portfolios became the favourite learning instrument for their flexibility and for the challenges in technology and design. This made them really appreciated by the students.

The second time (2001) the students were more supervised and had to decide more in detail what their portfolios should look like, include and their purpose[59]. It seemed to work better, but some students still commented on the lack of portfolio supervision, especially working on reflections and comments on soft ware products and texts. Technology was also still hard to master for some, but as the year before the majority appreciated working with professional programs and qualified web design.

Summing up the experiences, the course included some of the latest web design programs, had a project oriented learning organization and used digital learning portfolios for examination and presentation purposes. The students were less restricted than their American counterparts which seemed more aligned with standards and supervised. My function as a portfolio supervisor and teacher gradually developed out of practice rather than recommendations from readings in portfolio management and supervision.

The linear style of portfolio development was never put into reality in this course, though it could have been a challenge for me but I am somewhat reluctant to linear strategies in teaching[60]. The second year's effort to straighten up the portfolio methodology will have to be reconsidered as I do not think it was followed very much by the students nor me. It is easier said than done to supervise student digital portfolios in a good fashion. My shortcomings have dealt most with decisions on students' written pieces where many did not devote enough time and wrote only for the purpose of satisfying me and the examination procedures. But these cumbersome and painstaking experiences showed me the need for a more thoughtful content management and communication with students, digital and in real life with students.

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[59] http://elwa.ilu.uu.se/jansju/LIKT.htm Click A, B, and C for student responses.
[60] See page 9 in this study.

3.4.2. Two American courses with digital portfolios in teacher education

Lessons learned from the LICT course in Sweden are supported by similar American experiments. *Introduction to Media and Computers in Teaching*, an introductory level course at University of Virginia for pre-service teacher education students in their third year, used digital learning portfolios with great success in over-coming "computer phobia" among the students. Self-evaluation and hard work with programs seemed to be the creative blend there as well as in LICT.

 "Students are encouraged to consider a broad definition of how success can be demonstrated. In this way, technology [digital] portfolios function as an instructional strategy that emphasizes problem- solving and the development of a conceptual understanding of software applications rather than simply the performance of various keystrokes, commands and menu selections"[61].

Being creative, using performance assessment with portfolios and feeling the computer technology at their fingertips gave the students self-confidence.

A similar course at Pacific University, California, used digital learning portfolios for final assessment in multiple subjects in reading methodology during two semesters[62]. Meeting course criteria, developing self-evaluation and self- assessment were the aims of the digital portfolios. Instead of creating the portfolio themselves like in the other two projects, the students used readymade templates, which could be altered if the student wanted to go further with the multimedia application Hyper Studio.

The portfolios functioned well in meeting the objectives of showing student reflections and the need for examination. The primary strength of this use of portfolio was that students could use many various kinds of evidences showing their ability to teach reading and writing, such as audio and video clips, animations and texts etc. Aesthetic and personal features were among the most valuable to the students, which was unexpected. The students developed further in expressing both verbal and non-

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[61] P. 6 in Kovalchick/ Milman/Hrabe (1998).
[62] Piper (1999).

verbal notions using multimedia technology than the researcher had thought they could. This goes very well together with the findings in LICT and the previously mentioned course in West Virginia. It seems that computers add something new and creative that fascinates both staff and students.

However, there were some severe drawbacks in this project: not enough time and technical knowledge to prepare the portfolio, many malfunctioning computers, cross-platform compatibility problems, no fulltime lab technician.

3.4.3 Summary

The three perspectives that should be included in a teaching portfolio, credentials, ideas of teaching and learning, self-reflection and learning, are found in most portfolios presented here. The LICT portfolios had credentials only for the semester course, showing the lack of integrating portfolios at the program. Creativity using graphic applications and viewing one's learning over time seem most valued by students.

PERSPECTIVES

Part 4 Technology and design

4.1. Technology and metadata

Storage and navigation are other problems that digital portfolios encounter if they are used for longer periods of time. The learning portfolio concept considered in this study might not be relevant after exam, or even before. Instead a working portfolio with archive possibilities and as a toolbox for extracting and editing material can be of better use. The sheer amount of material can hamper anyone trying to figure the learning processes involved. There is nothing that hinders a learning portfolio to work as a toolbox portfolio and vice versa, but in order to get all things structured right, a new method for organizing digital content is needed. In time the portfolios shown in this study will be gone (some already are) and less useful for learning and development since all material lack abilities to be restructured for new purposes, in classrooms for instance or when planning lectures and tasks in schools.

Imagine a pupil from 1st class to high school, 12 years of production. Or a student on a 5-year programme, say a medical student or future engineer that will have many important artefacts and materials that needed a rational distribution and content design. Other stakeholders in organizing material in education are, besides schools and other institutions for learning, educational technology companies, publishing houses, museums, archives, printing services and journals, newspapers, bureaus etc. Not to forget, the individual student and his/her network of colleagues, friends and contacts will also profit.

All these would be benefited if the digital portfolio was distributed via a web site and/or via an informational system that would mark up the material in a standardized way. The idea of standardization is to get portfolio producers and stakeholders to arrange the contents according to relevant standards so the distribution becomes easy and movable due to modularized content. The content should also be possible to redesign and make secure with metadata tools according to international standards of the meta-data marking language for educational materials. However, the development of standards is a matter of international concern and portfolios will benefit at the same time when other educational materials will be available in standardized formats.

The Folio thinking project mentioned above will use metadata based portfolios in a database that will be put to work during 2002 at the Department of teacher education, with a portfolio prototype developed at the APE – project at Uppsala Learning Lab, where APE stands for *Archives- Portfolios- Environments*[63]. Two international standards for learning and instruction are mentioned below in an outline of the project, *IMS- LOM* [64] and *Dublin Core*, which will never bother the individual

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[63] www.learninglab.uu.se and www.wgln.net
[64] www.imsproject.org and http://dublincore.org/

portfolio maker nor the supervisor, but will be built in the templates and interface of the portfolios.

The APE- portfolio project aims at implementing an "XML-based portfolio/archive system that uses the IMS Content Packaging standard, mainly to enable interoperability with similar systems. The system allows students to create, organize and share a personalized collection of resources stored in a central archive. A resource could be any digital or non-digital information, e.g. annotations, papers, reference literature, or links to various sources. Each resource has metadata attached to it according to the Dublin Core Metadata standard. The contents of portfolios are stored in a database, allowing resource discovery through metadata-specific search of the entire resource library, or simply by browsing through other users' portfolios"[65].

The great differences from the digital portfolios that have been developed so far are its database structure behind and XML technology. The APE portfolio will not be accessible on a web site and will not be as well designed as the portfolios presented in this study. The purpose is different though. The metadata attributed to the files/documents put in the portfolio system makes the portfolios searchable according to contents rather than where on the database or in what format the document is made. There is a separation of content from file formats which makes a document possible to present as Word, pdf, audio or video clips.

Web pages with learning portfolio as shown in this study are made with Html coding which enables presentation on the Internet through their interlinks with locations (web addresses, that is URLs, Unified Resource Location as specified in html codes to a certain web address) that are hard to navigate in. Preferable according to the aims beind the APE portfolio and metadata challenges are URIs (Unified Resource Identifier) which are not bound to the physical location of the files, which can be anywhere on servers running. No portfolios are yet made with this structure but it seems that the next Internet generation, the Semantic Web, should welcome such an enterprise.

Technical questions such as organizing material are not to be underestimated when dealing with digital portfolios and other ICT applications for schools and higher institutions. There is always an informational/computer "heritage" in a system that leads school managers and ICT developers to certain decisions when deciding for an ICT solution, such as digital portfolios running in a certain ICT environment[66]. Investments in earlier systems and networks are not only a question of money and technology, but also of people, conceptions, routines etc. A solution such as metadata based portfolios will encounter challenges in several of these human and technical investments. And if digital portfolios are to be used by groups besides individuals, a group based platform must be developed which probably leaves the common format of individual web pages.

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[65] From project thesis abstract by D-level thesis in Computer Science, Jan Danils and Jöran Stark, students in Computer Science, Uppsala Learning Lab, Uppsala University 2001.
[66] Nilsson (2001)

4.2 Design

The explosion of personal homepages has created a culture of web design that every portfolio producer must face, accept or ignore. In 1995 when Internet became known worldwide web pages could look amateurish but few students want today to stay at that level. The LICT course and other multimedia portfolio projects were successful in the eyes of the students due to the fancy design. If readymade templates were the only interface it seems from these courses that the portfolio would feel and look less personal. Students want to add images, design buttons, make their own kind of navigation and show their artistic abilities. Developing a "net personality" without using as much tools and power as possible available in computer applications and web design leave students frustrated, since the web is their new way to present themselves with all hype, new media, flashy animations they can get.

What must be remembered is that publishing on the Internet has its own rules just like journalism, video conferencing or academic publishing. Something is added and taken away at each step with a new media. The web has its own graphic rules and portfolios on the web will have to face the comparison with all other kinds of web presentations. The guides that exist will put all web page authors before the same questions of who is the target groups, what is the message, what images should be used to support what textual message etc[67]. It does not matter if one is 15 or 55, the same presentation methods apply, the same eight seconds or so waiting time before the visitor clicks further on bored with one's boring site or not having seen it at all (which applies to many sites at LICT that use Flash).

A well structured graphic interface enables readers to look for visual images that support the textual content. But pictures and colours are often overwhelming and leaves the content far behind. "Less is more" is a nice attitude that exhorts portfolio producers to use only graphics and pictures when needed to enhance content [68]. Design experience, knowledge and creativity are becoming important and are often very appreciated when portfolios go digital. Projects such as Folio Thinking and the APE portfolio prototype which both lack design abilities will face challenges from some students wanting to design their own portfolio graphics etc. On the other hand, some will feel a relief not having to learn new graphic editing/ web design programs. The Semantic Web with its metadata capabilities is a solution that looks for its future users.

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[67] www.useit.com, www.jonasweb.nu, http://www.skolverket.se/skolnet/abc/planera/index.html ,
http://www.multimedia.skolverket.se/
[68] Westerlund (2000)

Part 5 Theories of assessment and learning on portfolio

Lee Schulman claims that teaching portfolios are theoretical acts.

"By this I mean that every time you design, organize or create in your teacher education program a template, a framework or a model for a teaching portfolio, you are engaged in an act of theory"[69]

Below some common considerations on educational theories and development of digital learning portfolios will be brought up. Assessment and learning are two important domains in educational theory where portfolio thinking has emerged as a new interesting candidate for both purposes.

5.1 Assessment

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

Production rather than reproduction
Long term evaluation rather than short term testing.
Width in documentation
Individualisation [70]

There is an international discussion and sometimes dissatisfaction in higher education among university teachers, researchers in education and administrators with students studying for narrow exam results and tests, leaving deeper and reflective understanding behind.

In teacher education as well as in other studies in higher education for professions outside academia the criteria for success is how a student handles the professional challenges. Traditional evaluations, e.g. final written exams in large groups, are often criticized for not showing what the student needs at the job in front of yelling kids, with just a chalk and blackboard to work with. Portfolios with evidence of student teaching in video clips etc. might be better at showing classroom management as was shown before in this study[71].

In Sweden, which is the only country that will be considered somewhat concerning portfolio assessment in this part, learning portfolios are not brought up in overviews of assessment methods but may be labelled under "self-assessment" and "authentic assessment"[72]. Experiments show problems with establishing criteria and validity in

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[69] P. 24 in Lyons ed (1998).
[70] P. 121- 132 in Ellmin (1999)
[71] Page 31.
[72] P. 45- 59 Wiand (1998). Similar kinds of assessment to portfolios are "profiles of achievement" and "learning contracts", p. 56-57.

the new kinds of assessments. Students seem initially reluctant and a majority prefer still final written exams. Experts in evaluation, though, see a trend in evaluation methods towards production rather than reproduction, where portfolio contents could be one kind of products together with other.

"In line with earlier research on student studying strategies and learning, the results in this study also point out that a change of evaluation forms towards more of *producing evaluation* – regardless of form -is a necessity, if one wants to enhance deeper understanding"[73]

Regarding digital learning portfolios in teacher education, it has been said already that the feasibility experiences and the little research there is show that prospects are good for using them for assessment purposes. If enough time, training and resources are available that is. The burdens can be very hard if they are not[74].

Standards like the American ones mentioned earlier in this study could be directing students towards learning goals, motivating them to discuss goals and methods of reaching them. This could be done in much the same way as Swedish teachers wrestle with the national curriculum and goals, leaving the responsibility to teachers, schools and municipalities to develop methods and show that goals have been reached. Teacher education would be more aligned with school discussions on management by goals in that way.

5.2 Learning
When developing criteria by oneself according to standards, gathering evidence, it is inevitable that one learns a lot. Portfolio development is also a working method and learning technique as well as assessment strategy. Many questions on learning with portfolios could be raised, but here the social character is only discussed.

How learning portfolios do work when one single student heads towards self-assessment? Is each student only focusing on his/her portfolio? Is "independent work" further enhanced with portfolios towards solitary self-disciplined students? What about socio- cultural aspects of learning?

Portfolios must be related to broader discussions on curriculum, theories on pedagogy and teaching if they are not to be just another extension of what exists in school, but what the school wants to emphasize. Technology itself does not come with a certain method[75]. Portfolios like are a "pedagogical chameleon" that may be used for all kinds of purposes and in different teaching contexts the benevolent sceptic towards portfolios Olga Dysthe writes[76]. Classroom management, learning and teaching are not affected by portfolios she believes.

"Teachers who are not familiar with a process oriented writing based on sociality are taking a risk using portfolios as a further development and broadening of 'independent work, where each pupil works all by him/herself, in his/her own time, taking the risk this means in narrow-minded possibilities for learning" [77]

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[73] P.80 in Lundmark/Andersson (1997).
[74] Stecher (1998)
[75] Pedersen in Riis (2000)
[76] Dysthe (1999)
[77] P. 93 in Dysthe (2000).

However, the overall question here is digital learning portfolios. Dysthe does not believe that digital portfolios differ much from paper ones, the main change is portfolio work in itself. In Part 3 and 4 in this study it was shown though that design, creativity and visibility were very important notions to students using digital portfolios. The web was also considered as another media, separated from papers, and with its own laws of design and communication. Dysthe is not aware of these aspects.

But concerning social vs. individual aspects, are digital portfolios a better remedy than regular paper folios? They should be according the their visibility and open character, especially when published on the Internet. Speculations are easy here since almost no studies has been made on consequences of introducing digital portfolios for other purposes than individual learning. Earlier in this study it was stated that portfolios in American teacher education were a success[78]. But the code words were very much individualized:

"student-centered",
"self- empowering",
"encourage pre service teachers to assume a responsibility for their learning".

No common goals or social learning processes were recorded. The work was mainly regarded as solitary.

New questions on portfolios are raised for two purposes; digitalisation and social learning processes. Nilsson (2001) wants to explore the challenges and asks:

?   What working methods are to be supported with digital portfolios ?
?   Is it possible to build collective portfolios ?
?   Is it possible to hyperlink between individual and collective material ?
?   How is identification possible ?
?   Will it be possible to follow group processes and comment on these ?

Metadata technology will solve some of these problems with its use of content organisation and standardized vocabularies for each metadata purpose. Other relevant perspectives include educational theory when applied to ICT supported learning environments. Theories of social, cultural and historic contexts in education abound and are at this time in 2001 probably the major field in Swedish educational research[79]. If brought into reality digital learning portfolios wherever they are used would have to encounter these discussions[80].

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[78] Page 40, specifically on portfolios in teacher education. All guides to using portfolios mentioned almost without exception positive to portfolio assessment, some in an exhilarant manner, e.g. Wiedmer (1998).This study does now bring out a whole picture of portfolios, pros and cons. Lyons (1998) and Sunstein/Lowell (2000) are most broadminded on their subject though.

[79] Carlgren (1999) and Säljö (2000) as two main proponents, with the latter one more devoted to discussing relations between education and technology such as ICT- supported learning.

[80] Dysthe (1999), Dysthe (2000), Nilsson (1997) and Nilsson (2001) are aware of the socio-cultural perspective on learning in relation to (digital) portfolios. A theoretical approach similar to socio-cultural perspective is "activity theory". See Jonassen/ Rohrer-Murphy (1999) for ICT implications. The question of self-directed and self-disciplined learning in portfolios could be benefit from earlier research on individualization in learning by Österlind (1998). Säljö has laid out some ground for a

If this is a way to go with digital learning portfolios for teacher education a vast new area opens. Teacher educators has experimented for several decades using various socially integrated learning styles; discussions of cases, problem based learning (PBL), group seminars including collective evaluations, group exams etc. The step over to partly collective digital portfolios in a network at department web sites may be easier there than in schools.

On the other hand there are some real problems with common access to personal portfolios. Integrity must be saved from unauthorized use, data logs should be erased so no one can track individual using computers in common networks and everybody should feel safe that no "Big Brother" is logging all moves one makes and all one writes at the keyboard. We should not forget that when if certain kinds of power and control are abolished, new kinds will take their place[81]. Not only technology but also working methods has features embedded in power relations that need to be discussed.

The discussion on metadata and standardization in Part 4 would surely contribute to using ICT in for common strategies, but it is too early now to overview what this technology leads to even it was a decade since Broady (1992) brought up the question on collaborative and standardized digital tools for teachers.

Crucial is whether open discussions on portfolio contents and quality are supported by the schools and teachers implementing this new learning method. What has been shown and advised in this study so far is several collective open procedures. The "round table" conferences at the New York high school and introductory talks to students when implementing portfolios in teacher education are some. The LICT course with its web portal with all portfolios gathered in one place there were many opportunities and challenges for joint work. The responsibility for building the portal and integrating it with portfolios was all the time in the hands of the student groups that ensured many collective discussions and decisions. This has not been tracked down in the survey though.

How does digital portfolios become an integrated part of a socio-cultural perspective on learning, if that is what one wants? Nilsson (2001) is the only one so far in Sweden who dares bring together digital portfolio development and socio-cultural aspects. Nilsson (2000) sketches how digitalisation and learning may develop within a decade.

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socio-cultural perspective on learning and ICT in Säljö (1999) and a hint for teachers in Säljö (2001), but much is left undiscovered. However, research is supervised by Säljö at LearnIT, a research program on learning and ICT at Gothenburg university. See www.ped.gu.se/learnit

[81] Nilsson (2001).Control and discipline are still at the core of all kinds of education: "The function of education has never been to free the mindand the spirit of man but to bind them…were young people truly creative the culture would fall apart", Jules Henry, quoted in Österlind (1998). See also Broady (1980).

But the disciplinary physical institutions of 19-and 20 [th]centuries are in crisis, i.e. factories, schools, prisons.Instead of classroom surveillance, digital codes and data bases marked by new kinds of informational control devices are what comes as next arena of power struggles in education. Digital portfolios may be viewed as another kind of self-presentation through new medias that entraps knowledge and individuality more than it releases. Further discussions of the transition from disciplinary societies to control societies, the starting-point is a seminal text by Gilles Deleuze (1990)

In year 2010 digital portfolios are standard in Swedish schools, and follow students all through life in a life long learning perspective[82].

The aim of this study so far has been to support such a vision. A proposal for implementing digital learning portfolios in Swedish teacher education within that vision is stated in the appendix no 8. It sums up some of what has been said so far in this study and gives clear advices to teachers, administrators and policymakers in ICT supported higher education.

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[82] P. 13- 14 in Nilsson (2000)

6 Summary

This study has two purposes, one large and one small:
to scan the current state of digital learning portfolios in all kinds of areas with focus
on teacher education and to foresee the use of metadata technology. The former
purpose is fulfilled in the inventory, where many questions on learning, presentation,
examination, self-assessment etc are brought up and answered to some extent.

The latter is only shown in a rudimentary fashion in the study as no such thing as
metadata equipped digital portfolios with tools and repositories for learning as well as
for qualified storing, extracting and reusing purposes exists yet. But the sheer visual
digital learning portfolios on the web will in some areas, eg. higher education, be
replaced with semantic systems if the idea of portfolio will survive. The task for
future studies is to prepare for such survival.

A start of future discussions and studies are the proposal which combines my
explorations within both purposes. Neither the experiences from building regular web
based learning portfolios nor the metadata ambitions should be neglected.

References:

Ackelman, Kjell (2000) *Elevportfolio* (Stockholm: Gothia)

Alexandersson, Mikael, Linderoth, Jonas and Lindö, Rigmor (2000) *Dra den dit och lägg den där.* IPD- rapporter no 2000:15 (Göteborg; Institutionen för pedagogik och didaktik, Göteborgs univ)

Almqvist, Jonas (2001)"Bilder av Internet", in vol 10: no 1, *Utbildning och demokrati* (Örebro: Pedagogiska institutionen, Örebro Universitet)

Andréasson, Elisabeth , Berg , Mari-Ann and Jonasson, Patricia (1997) "Portföljmetodik för engelsk språkfärdighet", in *INSIKT* no 1, *Vetenskapliga rapporter, HLK* (Jönköping Högskolan i Jönköping)

Barrett, Helen(2001) *Paper submitted at AACE conferences ,proceedings.* (Association for the Advancement of Computing in Education www.aace.org). Available at http://transition.alaska.edu/www/portfolios.html, (011211)

Barrett , Helen (2000) "Create your own electronic portfolio", in *Learning & Leading with Technology*, vol 27, no 7 (Eugene, OR: International Society for Technology in Education). Available at http://transition.alaska.edu/www/portfolios/iste2k.html.

Bern, Kerstin et al (2001) *Portföljmetodikens möjligheter*(Stockholm: Gothia)

Broady, Donald (1980) "Den dolda läroplanen" in *KRUT* no 16 (Stockholm: Föreningen Kritisk Utbildningstidskrift)

Broady, Dodnald (1992) "Kunskapsverkstaden — om lokala dokumentbaser som arbetsverktyg för lärare", *Datorn i Utbildningen*, vol V, no 2 (Stockholm: Stiftelsen Datorn i Utbildningen).

Broady, Donald and Haitto, Hasse (1996). "Internet and the Humanities - the promises of Integrated Open Hypermedia" In *Proceedings of Contemporary computer and network technologies* (Stockholm: Children's Computer Club, Moscow/CID/Kungliga Tekniska Högskolan)

Burge, Elisabeth , ed. (2000) *The strategic use of learning technologies. New directions for adult and continuing education*. No 88 (San Fransisco, CA: Jossey-Bass)

Chen, Helen (1998) *Learning careers project.* (Palo alto, CA: Stanford Learning Lab, Stanford University) Available at http://sll.stanford.edu/projects/hlc/LCP_Year1.pdf. (011211)

Danielsson, C. and Abrutyn, L. (1997), *An introduction to using portfolios in the classroom* (Alexandria, VA: Assoc. for Supervision and Curriculum Development)

Deleuze, Gilles (1990) "Post- scriptum sur les sociétés de contrôle" in *Pourparlers* (: Paris: Ed. De Minuit)

Dysthe, Olga (1999) "Mappevurdering som laeringsform og sammanhengen med kunnskaps- og laeringssyn", in Fuglestad, Otto, et al, eds.(1999) *Reformperspektiv på skole- og elevvurdering* (Oslo: Fagbogsforlaget)

Dysthe, Olga (2000) "Porteföljemetodikk med sosiokulturell forankring", in Björk, Maj,ed (2000) *Att växa med språk och litteratur. Svensklärarföreningens årsskrift* 2000. No 223 (Stockholm: Natur och kultur)

Ellmin, Roger (1999) *Portfolio* (Stockholm: Gothia)

Ellmin, Roger and Ellmin, Birgitta (2000) *Portfolio i praktiken. Lärare berättar* (Stockholm: Svenska Kommunförbundet)

Hartnell – Young, Elisabeth and Morris, Maureen (1999)*Digital professional portfolios for change* (Arlington heights, Australia: Skylight).

Henningsson- Yousif, Anna, (1999)*Utvecklingsområde - att arbeta med mål och resultat: Ekenäskolan* (Stockholm: Skolverket) Available at http://www.distans.hkr.se/kkmtrl/skolbeskrivningar/am/ekenas.pdf (011211)

Henriksson, Eva and Sandell, Marie (2000) *Kom igång med portfolio* (Stockholm: Gothia)

Jedeskog, Gunilla (2000) *Teachers and computers* (Uppsala: Pedagogiska institutionen, Uppsala Universitet) Available at http://w3.ub.uu.se/fulltext/91-506-1439-8.pdf (011211)

Jonassen, David and Rohrer-Murphy, Lucia (1999) "Activity theory as a framework for designing constructivist learning environments", in *Educational Technology Research and Development*. Vol 47 no 1 (Bloomington, IN: Association for Educational Communications & Technology). Available at http://www.aect.org/default.htm (011211)

Kankaanranta, Marja (1998) "Towards digital bridges between educational cultures" in Jokinen, Hannu and Rushton, John , eds. (1998) *Changing contexts of school development* (Jyväskylä: Institute of Educational Research, University of Jyväskylä:). Available at www.jyu.fi/ktl/publications/electronic/001/kankaanranta.htm (011211)

Kovalchick, Anna,Milman, Natalie and Hrabe, Elisabeth (1998) *Instructional strategies for integrating technology: electronic journals and technology portfolios as faciliators for self-efficacy and reflection in preservice teachers* . No ED 421115 in ERIC (Educational Resources Information Center, Washington). Also published in*Technology and Teacher Education Annual,* 1998.

Lindström, Lars (1997) "Portföljen som examinationsform" in *Häften för didaktiska studier*, no 64 (Stockholm: HLS förlag:)

Lindström, Lars, Ulriksson, Leif and Elsner, Catharina(1999) *Portföljvärdering av elevers skapande ibild* (Stockholm: Skolverket)

Lindström, Lars (1998) Interview in *Tema Forskning* (Stockholm: Lärarhögskolan)

Linnakylä, Pirjo,Kaankaranta, Marja and Bopry, Jeanette(1999) *Portfolio on the web,* (Jyväskylä: Institute of Educational Research, University of Jyväskylä).

Linnakylä, Pirjo (2000) *"Digital portfolios in graduate studies",* paper submitted to ECER conference (Edinburgh: European Conference on Educational Research)

Lundmark, Annia och Andersson, Towe(1997) *Studenters upplevelser av examinationen* (Stockholm: Högskoleverket)

Lyons, Nona ed. (1998) *With portfolio in hand*. (New York and London: Teachers College Press at Columbia University).

Malm Ekegård, Berit (2000) *Vad tycker nyutexaminerade grundskolllärare om lärarutbildningen ? Planering och uppföljning no 1* (Uppsala: Lärarutbildningsområdets Utbildnings- och forskningsnämnd, Uppsala Universitet)

McLaughlin, Maureen and Vogt, MaryEllen (1996), *Portfolios in teacher education*, by (Newark, NJ: International Reading assoc.).

National Council for Accreditation of Teacher Education (1997)
Technology and the New Professional Teacher:Preparing for the 21st Century Classroom (Washington: Washington, DC: National Council for Accreditation of Teacher Education). Available at http://www.ncate.org/accred/projects/tech/tech-21.htm (011211)

Niguidula David(1997) "Picturing performance with digital portfolios" in *Educational Leadership*, vol 55: no 3 (Alexandria, VA
:Association for supervision and curriculum development)

Nilsson, Lars-Erik (1997) *Plattformar för distribuerade läromiljöer*.(Kristianstad: Centrum för kompetensutveckling, Högskolan i Kristianstad).

Nilsson, Lars-Erik (2000) *Skolan 2010. En möjlig utveckling av skolan med stöd av informations- och kommunikationsteknik och utvecklingens konsekvenser* (Stockholm: Skolverket*)*

Nilsson, Lars-Erik (2001) *Ett ramverk för en diskussion om datormedierade lärmiljöer.* Manuscript, unpublished (Skolverket: Stockholm)

Olsson, Niklas (1997) *Examination vid universitet och högskolor* (Stockholm: Högskoleverket)

Piper, Carla (1999)*Electronic portfolios in teacher education reading methods courses,,* noED 442755 in ERIC, (Washington, DC: Educational Resources

Information Center:). Available at
http://www.chapman.edu/soe/faculty/piper/aera.htm (011211)

Polonoli, Keith (2000) *Defining the role of the digital portfolio in teacher education,* no ED 447806 in ERIC (Washington, DC: Educational Resources Information Center).

Riis, Ulla, ed (2000) *IT i skolan mellan vision och praktik* (Stockholm: Skolverket)

Skolverket (1998) *Reform i rörelse,* no 2 (Stockholm: Skolverket).

Stecher, Brain (1998) "The local benefits and burdens of large- scale portfolio assessment", in *Assessment in Education*. Vol 5, no 3 (Carfax, PA: Carfax publishing:)

Sunstein, Bonne and Lovell*,* Johanthan,eds (2000) *The Portfolio standard* (Portsmouth, MA: Heineman:)

Säljö, Roger (1999) *Lärande då och nu.* (Stockholm: ITiS-delegationen, Utbildningsdepartmementet)

Säljö, Roger (2000) *Lärande i praktiken* (Stockholm: Prisma:

Säljö, Roger (2001)"Informationstekniken och bilder av lärande", in *Datorn i utbildningen,* no1 (Stockholm: Stiftelsen Datorn i utbildningen)

Taube*,* Karin (1995) *Portfoliometoden* (Stockholm: Gothia)

Teacher Education Quarterly. No 1, vol 25, (San Fransisco, CA: California Council on the Education of Teachers). Available at http://members.aol.com/caddogap/ccet/teq.htm (011211)

Tydén, Thomas and Andrae Thelin, Annika (2000) *Tankar om lärande och IT* (: Stockholm: Skolverket)

Utbildningsdepartementet (1999) *Att lära och leda.* SOU 1999:63 (Stockholm : Utbildningsdepartementet)

Utbildningsdepartementet (2001) *Nya villkor för lärandet i den högre utbildningen* SOU 2001:13 (Stockholm: Utbildningsdepartementet). Available at http://utbildning.regeringen.se/propositionermm/sou/2001/sou2001_13.pdf (011211)

Westerlund, Bosse (2000) *Less is More: det visuella uttryckets betydelse för lärmiljöer på webben*, (Stockholm: CID/ Kungliga Tekniska Högskolan). Available at http://cid.nada.kth.se/il/dig/verkstad/lim/ (011211)

Wiand, Towe (1998*) Examinationen i fokus. Rapport nr 14* (Uppsala: Enheten för utveckling och utvärdering, Uppsala Universitet)

Wiedmer, Terry (1998) "Digital portfolios" in *Phi Delta Kappan*, vol 79 no 8 (Bloomington, IN: Phi Delta Kappa Assoc)

Wiklund, Ulla (1996) "Portföljen -en model för utvärdering av musikutbildning", *Pedagogiska Publikationer* no 2 (Stockholm: KMH förlaget)

Wyatt III , Robert L and Looper, Sandra (1999),*So you have to have a portfolio?* by (Thousand Oaks: Corwin Press).

Österlind, Eva(1998) *Disciplinering genom frihet.* Diss. (Uppsala: Pedagogiska institutionen, Uppsala Universitet)

Appendix1

Baseline Requirements--all portfolios--hardcopy and electronic at Mt. Edgecumbe High School in Alaska

1. A personal cover page

2. An annotated table of contents

Each item in the table of contents has a short explanation or description of the sample, which explains your reason for including it in your portfolio (What skills, growth, capabilities and/or accomplishments does the work represent?)

1. A personal statement--this is your introduction and can also be used as an application "essay" for colleges or scholarships

2. A résumé

3. Transcripts (optional)

4. Letters of reference

5. A minimum of eight samples representing at least four different academic subject areas. Each sample should include a brief reflection on its significance.

6. A minimum of two articles, newspaper clipping, certificates, photographs, or other evidence of two different non-academic activities. This may include sports, family, culture, clubs or organizations jobs, community service or hobbies. Each piece should include a brief introduction statement to tell its significance.

Baseline Requirements--electronic

1. All original artwork: this includes backgrounds, photos and graphics

2. A custom header developed in Photoshop

3. One QuickTime, audio or video file

Optional--

1. Other samples of academic achievement

2. Other samples of non-academic life

3. Photos, cassettes, videos (audio clips and/or video clips, QuickTime, panoramic, object oriented files...etc. in electronic portfolios)

4. Diskettes or CD-ROMS

5. Photographs / digital pictures...

Evaluation:

1. Are the required contents included?

2. Has editing been carefully done so that mechanical errors are non-existent?

3. Is the portfolio neat and organized with samples easy to find, sections labelled and appearance pleasing to the eye?

4. Does it define you as a person?

5. Mt. Edgecumbe electronic learner portfolios may contain:

    1) Family history/personal demographics:

    2) Cultural background

    3) Home community

    4) School community:

    5) Personal values and beliefs

    6) Career aspirations

    7) Academic demonstrations, experiences, projects, etc.

    8) Community service and volunteer organizations

    9) Work experience

    10) Travel experience

    11) Demonstration of intelligences: linguistic, logical-mathematical, spatial, musical, bodily kinaesthetic, interpersonal and intrapersonal

    12) Leadership and teamwork experience

    13) Academic records, variety of, and recommendations

    14) Personal accomplishments, recognitions, awards, certificates, honors, etc.

    15) Leisure activities, hobbies, interests, wellness, athletics, etc.

Accommodations of the materials to be included in an electronic portfolio can be through written language, photographs, graphics, video clips, audio clips and linkages to other electronic sources available via the Internet.

www.mehs.educ.state.ak.us/portfolios/portfolio.html

Appendix 2

Examples of grading descriptors for portfolios

"**Exceptional: highly imaginative**; demonstrates critical thought; unique; substantial application to own teaching: goes above and beyond requirements; creative; demonstrates both breadths and depth; shows individual's personality; professional in presentation and appearance: demonstrates considerable effort.

Thorough: well organized and complete; effectively and clearly presented: demonstrates clear understandings; applies what has been learned to the classroom; clearly shows connections; detailed; thoughtful and supported with ideas.

Adequate: meets minimum requirements; includes general information but lacks descriptive details; some application to teaching: lacks originality.

Inadequate: missing evidence or information; sloppy and poorly organized: demonstrates only surface understandings; no evidence of application to teaching; poorly written or does not include rationale statement"

P- 65- 66 in McLaughlin/Vogt (1996),

Appendix 3

Oklahoma general competencies for teacher licensure and certification of 1997

1. The teacher understands the central concepts and methods of inquiry of the subject matter discipline(s) he or she teaches and can create learning experiences that make these aspects of subject matter meaningful for students.
2. The teacher understands how students learn and develop, and can provide learning opportunities that support their intellectual, social and physical development at all grade levels including early childhood, elementary, middle level, and secondary.
3. The teacher understands that students vary in their approaches to learning and creates instructional opportunities that are adaptable to individual differences of learners.
4. The teacher understands curriculum integration processes and uses a variety of instructional strategies to encourage students development of critical thinking, problem solving, and performance skills and effective use of technology.
5. The teacher uses best practices related to motivation and behaviour to create learning environments that encourage positive social interaction, self-motivation and active engagement learning, thus, providing opportunities for success.
6. The teacher develops a knowledge of and uses communication techniques to foster active inquiry, collaboration, and supportive interaction in the classroom.
7. The teacher plans instruction based upon curriculum goals, knowledge of the teaching/learning process, subject matter, students abilities and differences, and the community; and adapts instruction based upon assessment and reflection.
8. The teacher understands and uses a variety of assessment strategies to evaluate and modify the teaching/learning process ensuring the continuous intellectual, social and physical development of the learner.
9. The teacher evaluates the effects of his/her choices and actions on others (students, parent, and other professionals in the learning community), modifies those actions when needed, and actively seeks opportunities for continued professional growth.
10. The teacher fosters positive interaction with school colleagues, parents/ families, and organizations in the community to actively engage them in support of students learning and well-being.
11. The teacher shall have an understanding of the importance of assisting students with career awareness and the application of career concepts to the academic curriculum.
12. The teacher understands the process of continuous lifelong learning, the concept of making learning enjoyable, and the need for a willingness to change when the change leads to greater student learning and development.
13. The teacher understands the legal aspects of teaching including the rights of students and parents/families, as well as the legal rights and responsibilities of the teacher.

14. The teacher understands, and is able to develop instructional strategies/plans based on the Oklahoma core curriculum.
15. The teacher understands the State teacher evaluation process, "Oklahoma Criteria for Effective Teaching Performance," and how to incorporate these criteria in designing instructional strategies.

www.octp.org/accreditation.html

Appendix 4

INTASC standards

Principle #1:The teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teachers and can create learning experiences that make these aspects of subject matter meaningful for students.
.....
Principle #2:The teacher understands how children learn and develop, and can provide learning opportunities that support their intellectual, social and personal development.
.....
Principle #3:The teacher understands how students differ in their approaches to learning and creates instructional opportunities that are adapted to diverse learners.
.....
Principle #4:The teacher understands and uses a variety of instructional strategies to encourage students' development of critical thinking, problem solving and performance skills.
.....
Principle #5:The teacher uses an understanding of individual and group motivation and behavior to create a learning environment that encourages positive social interaction, active engagement in learning, and self-motivation.
.....
Principle #6:The teacher uses knowledge of effective verbal, nonverbal, and media communication techniques to foster active inquiry, collaboration, and supportive interaction in the classroom.
.....
Principle #7:The teacher plans instruction based upon knowledge of subject matter, students, the community, and curriculum goals.
.....
Principle #8:The teacher understands and uses formal and informal assessment strategies to evaluate and ensure the continuous intellectual, social and physical development of the learner.
.....
Principle #9:The teacher is a reflective practitioner who continually evaluates the effects of his/her choices and actions on others (students, parents, and other professionals in the learning community) and who actively seeks out opportunities to grow professionally.
.....
Principle #10:The teacher fosters relationships with school colleagues, parents, and agencies in the larger community to support students' learning and well-being.

www.ccsso.org/intasc.html

Appendix 5

NBPTS' approved portfolio entries

The National Board for Professional Teaching Standards requires very specific assessment items that allow teachers to present samples of their classroom practice over a specified period of time. The early childhood/generalist [in Sweden 1-7 lärare] must include five portfolio entries:

- o **"Introduction to Your Classroom Community** -- Teachers are asked to show how they structure their time, establish rules and routines and organize space and materials in ways that promote children's social development, mutual respect and emerging independence. Teachers submit a written commentary and an accompanying videotape that highlights their interaction with children.

- o **Reflecting on a Teaching and Learning Sequence** -- Teachers submit a written commentary and supporting artifacts which show how they nurture children's growth and learning as they explore an extended theme or topic drawn from at least two content areas -- social studies and the arts.

- o **Engaging Children in Science Learning** -- Teachers are asked to feature a learning experience that engages children in the investigation of a science concept. Central to teachers' written responses is a detailed examination of a learning experience they videotape. They are also asked to describe how this learning experience is embedded within an ongoing series of activities designed to promote children's understanding of science concepts and processes. Teachers submit a videotape and a written commentary.

- o **Examining a Child's Literacy Development** -- Teachers are asked to present the ways in which they foster literacy development in their classroom. They are also asked to analyze selected work samples from one child, and discuss the steps they would take to support the featured child's literacy development. Teachers submit a written commentary and the work samples from the selected child.

- o **Documented Accomplishments** -- Candidates document their work outside the classroom, with families and in the profession. They submit descriptions and documentation of those activities and accomplishments that illustrate their commitments to families and communities of their students and their contributions to the teaching profession. In addition, candidates compose two brief interpretative summaries of their accomplishments, one for accomplishments with families and the community and the other for accomplishments in the profession "

www.nbpts.org

Also at p. 35.36 in Wyatt III /Looper (1999)

Appendix 6

University teacher Carolyn F Austin's digital Teaching portfolio, 1998

"Evaluative Excerpts: Student Comments and Numerical Summaries

Written Evaluation Excerpts

The statements below are taken from student evaluations from a composition class (Writing 39C) dealing with research and argument, and a section of the Humanities Core Course, which dealt with questions of race and gender. Both courses were the culmination of their respective series. I have refrained from correcting grammatical and syntactical mistakes.

Positive Comments
"Carolyn's enthusiasm is what sets her apart. She dispenses with threatening her students to read (like previous TAs) and invokes their own desire to read. Overall an intelligent and well respected TA."

"Carolyn is always open to hearing your thoughts and aiding in the writing of papers. If I were to take Humanities again, I'd want her as my TA."

"She's a great teacher. Actually, she's too good. I kind of missed my other TAs because I could slack off in their class. This class I had to stay awake. Perfect teacher -- I'd recommend her to anyone, especially lazy people like me."

"I think I was lucky to have Carolyn as my TA this quarter because she was able to provide a detailed analysis of all of the readings as well as the lectures. I think she did this rather effectively through the discussions we held in class."

"Although her grading criteria was very high, it stimulated, challenged and also forced me to do my very best."

"Carolyn was a great TA! I enjoyed her section the most (out of the 3 quarters). She knows what she's talking about and presents it very well."

"She really made the discussions good, fostering good talks through interesting topics and good embellishment of what the lectures were saying."

"She knows what it is she wants from a paper and makes it clear to us in her office hours. This is good because it improves your paper. She's really tough on organization."

"This was a very very helpful class. The instructor was very clear when assigning the papers as well as helping."

"I feel Carolyn Austin is a great instructor. She is direct, funny, and very helpful. Her concern for students is greatly appreciated."

"Great instructor listens to student comments."

"I like the fact that she returned our assignments very quickly with lots of helpful comments. She was available at her office hours and went out of her way to be able to meet with every student. Also when I was lost, she pointed me in the right direction, as to which topics on my paper I should concentrate and develop further."

Negative Comments
"I felt that sometimes you forget (or forgot) that we are only freshmen and young. Your in depth analyses of the texts were excellent but how can I, at 18 years old find and understand the same in depth concepts."

"The only problem I had was with papers. You made a big effort trying to correct our rough drafts, but when I made the corrections on the final I realized that their were more comments on the final version."

"The e-mail part sucked though."

"I think it would help me more if I had sample writings that pertain to the assignment to look at. This way I have an idea what the assignment is asking me to do."

"One thing that I want to point out to her is that when I get my paper, sometimes I don't know why I get that grade. What I mean is that her comments is not enough that make me think I deserved that grade. Maybe she don't want to criticize us too much, make us feel bad, but I just think it's gonna help us a lot."

Numerical Summaries of Evaluations

Instructor/Course Evaluation Summary, Writing 39C
I taught this course in spring, 1994. Fifteen out of the seventeen students enrolled completed the evaluations. The first column indicates my average ratings, while the second and third columns provide average ratings for all other 39C courses and all other composition courses, respectively, taught between fall, 1992 and spring 1994. All figures are on a seven-point scale, seven being high.

Rating Average Writing 39C All Writing Courses
1. Did this course help you improve your writing? 6.5 5.2 5.4
2. Did peer comments and/or peer editing help you improve your writing? 5.9 4.4 4.7
3. Did group activities other than peer editing help improve your writing? 5.9 4.3 4.6
4.Did your instructor's written comments on your papers help you
 improve your writing? 6.7 5.6 5.8
5. Did your instructor use handouts, supplemental readings, audio-visual aids, or creative or innovative teaching techniques that seemed helpful?6.1 5.1 5.1

Self-Assessment of Teaching
My student evaluations consistently indicate that my students have learned something in my class, that their writing has improved, and their ability to deal with texts critically has increased. Eighteen out of nineteen of my students in the Humanities Core Course indicated that they would recommend me to other students enrolled in

the course, a number that I'm very pleased with. Many of my students gave positive notice to things that are central to my philosophy of teaching. I was pleased to see that fifteen out of twenty-one Humanities Core Course students gave me the highest rating possible when asked if I fostered open and intelligent discussion. Two students commented on my ability to lead discussions; one of these indicated that I covered important points not through lecture but through discussion. Many of the students in the composition course commented that my expectations of them were clear: students commented on my precise paper assignments and discussions of the papers. Students also commented on my availability outside of class, and my ability to listen to student questions and concerns in class. I was pleased to see one student point out that I didn't rely on coercion to prompt my students to read, but fostered their own desire to explore a new text.

I'm always working to improve my teaching, however. Like so many teachers who love the things they teach, I sometimes overestimate my students' abilities to learn, or more precisely their pre-existing skills, the time constraints they face outside of class, and the initial difficulties of dealing with concepts that I've now been working with (and sometimes struggling with) for over a decade. In response to one of my student's comments, I'm now working on being sure that my teaching is challenging without being sometimes overwhelming. Additionally, as the negative comment about my e-mail assignments indicates, at least one of my students was not really drawn into the electronic discussion that many of my students enjoyed. I need to work at overcoming student resistance to this new technology, but I also need to work on incorporating this electronic discussion into class discussion, so that students have less difficulty in seeing their e-mail work as integral to their class participation. /…/

Lastly, although none of my students' comments addressed learning modalities, I've been working on incorporating more techniques aimed at visual and kinaesthetic learners, and not just at aural learners. I'm attempting to use the board and overhead projector more frequently to provide charts and visual models. I've also begun working with more active teaching components. For example, I sometimes begin a review for a mid-term exam by asking students to draft a potential essay question on each of the texts we've read to date. I then set up flip charts around the room -- one per text -- where students write their questions. I then divide them into groups, assign each group a text, and ask each group to choose the question that best fits in with the central concerns of the course and outline an answer to it. Each group then presents its question and answer to the class. This technique not only prompts students to connect the reading material to themes in our lectures and discussions, pushing them to consider the analytical framework in which we've read these texts; its kinetic elements (movement from chart to chart, writing), multiple visual aids (flip charts), and student presentations also decenter the classroom, providing a multitude of foci for student investigation."

www.ags.uci.edu/~cfaustin/

Appendix 7

Survey to teacher students in the course Learning and ICT 2000 and 2001 in Uppsala

In 2000, 21 of 24 students responded. In 2001,22 students of 37. Average total response: 70 %.

"Enkätfrågor till LIKT vt 00 och 01 om portfolio

BAKGRUND
Kön:
Ålder:
Studieinriktning:
Studieavbrott?
Arbetslivserfarenhet:
Vilken datorvana hade du innan kursen ?

DIN PORTFOLIO
Vad har varit svårt med att använda portfolio?
Att portfolios är läsbara av fler på webben, har det påverkat sättet att använda den på gott och ont ?
När du skrivit i din portfolio, har du då försökt gissa dig fram till vad lärarna vill ha eller har du gått efter eget huvud ?
Du har fått utvckla din portfolio utan särskild mall. Hur har den friheten påverkat din uppläggning ?
Vad saknas / kan förbättras i din portfolio? Varför ?
Har relationen form/ innehåll varit tillfredställande i din portfolio ?

PORTFOLIOARBETE
Vad har varit mest lärorikt med att arbeta med digital portfolio ?
Hur kan den digitala portfoliometoden förbättras ?
Skulle du kunna tänka dig att arbeta med digitala portfolios i skolan ?
Vilken är den största nackdelen ?
Vilken typ av utvecklingsarbete måste till för att effektivt utnyttja digitala portfolios på ILU ?

KURSEN
Vilka fördelar respektive nackdelar ser du med det arbetssätt kursen i sin helhet haft ?

TACK FÖR DIN MEDVERKAN !
Jan Sjunnesson "

Appendix 8

PROPOSAL for implementing digital learning portfolios in Swedish teacher education

1. **Arrange courses and curriculum in teacher education that support all kinds of portfolio methodology**

1. **Develop portfolio standards of teacher competencies as recommendations. These standards should be worked out in cooperation with other departments, schools and students**

2. **Use digital portfolios for examination purposes at teacher education and other departments**

3. **Train students and teacher educators in digital editing and set up good computing facilities**

4. **Set up a content management computing system that lets students and staff easily store, use, design and access modular portfolio contents during studies and afterwards**

5. **Release time and resources for teachers and students to implement the digital portfolios. Make sure a portfolio policy is accepted and desired by faculty.**

6. **Start small scale experiments with templates and without. Use several design models and databases but get all projects within international ICT standards of content descriptions**

7. **Encourage teacher students to develop portfolios with personalized content and design that show themselves and their professional ambitions to stakeholders within and outside their education**

8. **Remember that Sweden is a part of the global world throughICT and that Swedish teacher education can benefit from experiences in other countries.**

9. **Let no teacher educator teach digital portfolios that has not done one him/her self**