ePortfolio Implementation Guide for Policymakers and Practitioners

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<th>Description</th>
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<tr>
<td><strong>Becta</strong></td>
<td>British Educational Communications and Technology Agency</td>
</tr>
<tr>
<td><strong>CPD</strong></td>
<td>Continuing Professional Development</td>
</tr>
<tr>
<td><strong>EACEA</strong></td>
<td>Education, Audiovisual and Culture Executive Agency (EU)</td>
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<td><strong>EU</strong></td>
<td>European Union</td>
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<td><strong>FTP</strong></td>
<td>File Transfer Protocol</td>
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<tr>
<td><strong>ICT</strong></td>
<td>Information and Communications Technology</td>
</tr>
<tr>
<td><strong>IMS GLC</strong></td>
<td>Instructional Management Systems Global Learning Consortium</td>
</tr>
<tr>
<td><strong>JISC</strong></td>
<td>Joint Information Systems Committee</td>
</tr>
<tr>
<td><strong>MIS</strong></td>
<td>Management Information System</td>
</tr>
<tr>
<td><strong>MOSEP</strong></td>
<td>More self-esteem with my ePortfolio project</td>
</tr>
<tr>
<td><strong>NCCA</strong></td>
<td>National Council for Curriculum and Assessment (Ireland)</td>
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<tr>
<td><strong>PDP</strong></td>
<td>Personal Development Planning</td>
</tr>
<tr>
<td><strong>SQA</strong></td>
<td>Scottish Qualifications Authority</td>
</tr>
<tr>
<td><strong>VLE</strong></td>
<td>Virtual Learning Environment</td>
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Partner Organisations

Department of Education and Skills
Ireland

H2 Learning
Ireland

Danube University Krems
Austria

The Center for Control and Assessment of the Quality in School Education (CCAQSE)
Bulgaria

The Cyprus Pedagogical Institute
Cyprus

Microsoft Ireland Operations Ltd.
Ireland

National Council for Curriculum and Assessment
Ireland

The State Examinations Commission
Ireland

Dublin West Education Centre (DWEC)
Ireland

The Centre of Information Technologies in Education (CITE)
Lithuania

Ministry of Education, Science, Culture and Sport
Slovenia

The National Education Institute
Slovenia

The Educational Research Institute
Slovenia

The Galician Regional Ministry of Education
Spain

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Preface

The ePortfolio Implementation Guide for Policymakers and Practitioners illustrates the actions needed to introduce ePortfolios to schools. As we move towards transforming European education systems, it is essential that policymakers and education professionals are fully aware of all the key implementation processes.

This Guide stems from a two-year pan-European EU Classroom ePortfolio (EUfolio) project. It started in May 2013 and proceeded to experiment with ePortfolio models in post primary (second level) schools. This project’s principal aim was to inform and support the implementation of innovative learning environments in education settings, through the use of Information Communications Technology (ICT).

EUfolio is a collaboration of 14 partners from seven countries; Ireland, Lithuania, Slovenia, Cyprus, Bulgaria, Spain and Austria. The idea for EUfolio project came from the ‘ICT and education’ Working Group created under the ”Education and Training 2020” programme, a network that includes 24 representatives from EU Ministries.

A number of member organisations came together with the common interest of implementing electronic portfolios as part of the ICT in education policy agenda at national level. The policy expert group partnered with researchers, educators and practitioners and secured funding from the Lifelong Learning Programme (KA1 - Implementation of the European strategic objectives in Education and Training) under the leadership of the Department of Education and Skills (DES) in Ireland.

Over the course of the EUfolio project, Partners designed, carried out and evaluated a pilot implementation of ePortfolios for teaching, learning and assessment in schools in Cyprus, Ireland, Lithuania, Slovenia and Spain. The pilot was a “policy experimentation” from which policymakers will be able to draw valuable real-world lessons. The hope is that following this pilot project, both policymakers and practitioners will encourage and action the use of ICT (specifically the ePortfolio approach) in teaching, learning and assessment. Allowing for different approaches in different contexts and taking account of practical resource constraints, the EUfolio pilot participants included 4,098 students and 194 teachers across the pilot countries. For a more detailed account of these numbers, please refer to Appendix 2 - EUfolio Implementation Overview.

Towards the end of the project, the EUfolio team moved to capture the learning from the project, the evidence for the efficacy of ePortfolios in teaching, learning and assessment. The team also moved to capture strategies of effective practice, sustainable implementation and consistent management. This publication is an attempt to present it in a condensed and comprehensive format.

The team set ambitious goals when embarking on this journey almost two years ago. A vast amount of work was completed, many successes were achieved and many challenges were encountered too. We will continue our work beyond the project and hope that our combined knowledge will be useful for other organisations and countries across Europe.

EUfolio Project Team
Introduction

The purpose of this guide is to provide policymakers and practitioners in the education sector with a set of guidelines to inform and support the implementation of ePortfolios in individual schools, district education settings and national education systems.

This guide contains suggested policies and procedures which have emerged from the EUfolio project on the use of ePortfolios in teaching, learning and assessment. It provides general lessons about the effectiveness and awareness of the merits of ePortfolio implementation, as well as the challenges and obstacles that may be experienced by implementers along the way.

The material covered in the guide aims to deliver specific and practical information on four primary issues:

1. It explains what an ePortfolio means for classroom practice.
2. It shows how ePortfolios can be implemented.
3. It explores the teaching, learning and assessment approaches.
4. It provides recommendations and guidelines on ePortfolio implementation.

Sections Overview

The guide's content ranges from a review of existing policies on the use of ePortfolios in education, to large-scale ePortfolio implementation, to ePortfolio assessment and evaluation. It comprises of four sections:

Section 1 is based on an in-depth literature review and it documents the knowledge and resources that are required to answer the question, 'Why introduce ePortfolios into schools?' This section defines an ePortfolio, details the merits of ePortfolios in education settings and shows how they differ from paper based portfolios. It explores ePortfolios in a European context.

Section 2 details how ePortfolios can be used as a tool for 21st Century Skills development and assessment. It explores how to best prepare for ePortfolio implementation and highlights the key considerations for ePortfolio implementation. Technical elements of ePortfolios are also explored.

Section 3 charts a three-tier implementation process for ePortfolios. First, there is the pre-implementation phase, demonstrating examples of ePortfolios and reorganising existing structures to facilitate ePortfolios. Second, with a focus on the process, there is the implementation phase, with a six-step guide pointing to each action. Third, there is the post-implementation phase, which looks at evaluation and quality assurance in respect of the implementation process.

Section 4 outlines the recommendations that are based on EUfolio project findings. Recommendations and guidance are made for the main policy making levels - national policymakers, regional policymakers and individual schools.
Further Information on ePortfolio Implementation

If any further information is required, you may contact eufolio@education.gov.ie. You may also contact any of the project partners. It is intended that the online Yammer community of practice, which was established during the project, will be populated with resources and moderated by the Irish Department of Education & Skills and its agencies.

The ePortfolio Implementation Guide for Policymakers and Practitioners is available on the Eufoilio website: www.eufolio.eu.
Section 1: Why Introduce ePortfolios To Schools?

Two ePortfolio platforms were piloted in 72 schools across 5 countries over a two-year period as part of the EUfolio project. The outcomes arising from this project were largely successful.

Considering this, and the fact that a thorough understanding of ePortfolios is necessary to appreciate the merits of the platforms, Section 1 will delve into the meaning of ePortfolios in the context of teaching, learning and assessment today. It will look at how they compare with traditional paper-based portfolios and will proceed to examine the benefits of electronic portfolios (ePortfolios). This section will also analyse ePortfolios in a European context.

1.1 Defining ePortfolios

To understand the true potential of ePortfolios in schools, they must firstly be defined. A range of ePortfolio definitions are currently in use. Some definitions regard the ePortfolio as a product or a personal space where students can collect digital files. These files present evidence of student experiences and achievements, and articulate learning outcomes.

Other definitions present ePortfolios as a process, allowing students to move beyond the notion of learning as they know it, and to gain insight into their personal learning process. Students are empowered to think creatively and critically in order to ultimately make sense of how they learn. They do this by recognising learning experiences, by reflecting on their skill development and by sharing, collaborating and presenting the evidence to others.

It is necessary to think of the use of an ePortfolio as an approach, or method, or support structure to teaching and learning. That is, a digital portfolio is both a quantifiable thing and at the same time, a process.

Properly defining an ePortfolio greatly depends on what it can deliver. An ePortfolio presented as a collection of electronic evidence, must be considered as multi-faceted. Consequently, there are several key elements which together can define ePortfolios.

These elements are:

- **Digital form**: a collection of digital resources, called a repository of artefacts.
- **Artefacts**: authentic content that proves competence and provides evidence of an individual's progress and achievements.
- **Organised content**: contains materials obtained from both formal and informal learning activities in a structured manner.
- **Authorship**: personally managed and owned by the individual who creates it. The owner can decide which parts of the ePortfolio are shared and with whom.
- **Reflection**: can be used for individual review, reflection and personal development planning.
- **Showcase**: particular sections of an ePortfolio to be shown to others - e.g. teachers, peers, parents.

1.1.1 EUfolio Definition of ePortfolio for Schools

Although there is no absolute definition of an ePortfolio, one definition was understood as true in the case of the EUfolio project. It is a definition that is derived from the Irish National Council for Curriculum & Assessment’s interpretation of an ePortfolio (NCCA, 2013) and it reads as follows:

**ePortfolios are student-owned dynamic digital workspaces wherein students can capture their learning and their ideas, access their collections of work, reflect on their learning, share it, set goals, seek feedback and showcase their learning and achievements.**

For a more in-depth exploration of ePortfolio definitions, please see the EUfolio deliverable; EUfolio Review of Existing ePortfolio Policies and Practices.
1.2 Comparing Paper Portfolios with ePortfolios

For centuries, people have managed perfectly well with paper-based portfolios, so it is natural to question the need for electronic portfolios at all.

Very simply put, a portfolio – paper or electronic – is a collection of evidence that is gathered together to show a person's learning journey over time and to demonstrate their abilities. In that way, people compiling portfolios are active participants in their own learning. Below is an examination of how paper and ePortfolios compare.

1.2.1 Paper Portfolios and ePortfolios

Paper portfolios hold a collection of draft and completed assignments in order to demonstrate the learner's abilities.

An electronic portfolio (also known as an ePortfolio, e-portfolio, efolio, digital portfolio, webfolio etc.) is fundamentally an electronic version of a paper-based portfolio, created in a digital environment, and can include text, images, audio and video material.

The table below, compiled by New Zealand's Ministry of Education (2011), serves to showcase and compare the qualities that are lacking in traditional portfolios with strongly advanced ePortfolios.¹

<table>
<thead>
<tr>
<th>ePortfolio</th>
<th>Paper Portfolio</th>
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<tr>
<td>Enduring</td>
<td>Can deteriorate over time, susceptible to environmental degradation.</td>
</tr>
<tr>
<td>Provides continuity and can be lifelong</td>
<td>Often time-bound and discontinuous</td>
</tr>
<tr>
<td>Totally mobile</td>
<td>Not easily mobile</td>
</tr>
<tr>
<td>Easily reproducible</td>
<td>A reproduction can be very time consuming and will not look as good</td>
</tr>
<tr>
<td>Enables collaborative work</td>
<td>Collaboration not easy and certainly not simultaneous</td>
</tr>
<tr>
<td>Can be a 'live' resource for others</td>
<td>Could be a limited and time-bound resource</td>
</tr>
<tr>
<td>Easily reviewable by anyone, anywhere, anytime</td>
<td>Needs to be physically present</td>
</tr>
<tr>
<td>Can be read, peer reviewed, or marked by multiple viewers simultaneously</td>
<td>Needs to be copied and then distributed to enable multiple viewers or markers</td>
</tr>
<tr>
<td>Allows different organisational 'views' of the one set of core resource material</td>
<td>Fixed layout and format</td>
</tr>
<tr>
<td>Allows learner/teacher interaction</td>
<td>Not unless done within the classroom</td>
</tr>
<tr>
<td>Provides student voice – feelings and emotions</td>
<td>Impersonal – generally does not reflect feelings and emotions</td>
</tr>
<tr>
<td>Easily and always available for editing</td>
<td>Not easily editable</td>
</tr>
<tr>
<td>Intended/designed to encourage reflective practice</td>
<td>Can be, but more difficult to include reflections</td>
</tr>
<tr>
<td>Anywhere, anytime access</td>
<td>Must be physically transported</td>
</tr>
<tr>
<td>A personal approach to learning that grows with the learner's maturity</td>
<td>Content and organisation mainly driven by teacher</td>
</tr>
<tr>
<td>Development focused</td>
<td>Often tends to be assessment focused</td>
</tr>
<tr>
<td>The owner has total control of the sharing and commenting capability</td>
<td>Once out of the owner's hands she/he has no control over access or comments</td>
</tr>
<tr>
<td>Secure – difficult/impossible to lose or misplace</td>
<td>Can be lost or easily damaged</td>
</tr>
<tr>
<td>Multimedia – text, charts, graphic images, sound, video and all combinations</td>
<td>Paper-based media only – text, images, diagrams, charts.</td>
</tr>
<tr>
<td>Can include embedded files</td>
<td>What you see is what you get</td>
</tr>
</tbody>
</table>

Electronic portfolios are a technological change, not a conceptual change, from paper portfolios but they still have a number of characteristics that differ from traditional portfolios. Electronic portfolios are convenient, expandable, versatile, and highly mobile. On the other hand, while paper portfolios are still used by many people and professions, they are generally cumbersome, time-bound, vulnerable to decay, and non-interactive.

1.3 Benefits of ePortfolios

One of the most powerful benefits of ePortfolios is that they allow for meaningful reflection. By reflecting on their own work saved in ePortfolios, learners can:

- develop their personal and school identities, as they complete various projects and reflect on their own capabilities and progress.
- connect learning across different subjects and time.
- develop self-assessment abilities to judge the quality of work using expert criteria.
- plan their own learning pathways as they come to understand what they know and are able to do and what they still need to learn.

Additionally, following the implementation of ePortfolios, more benefits are evident:

- **Skills development**: The use of ePortfolios can develop multimedia technology skills, as well as more general literacy, communication and problem-solving skills.
- **Evidence of learning**: ePortfolios facilitate meaningful learning, where students can learn to manage their own professional development and therefore contribute to their life-long learning.
- **Feedback**: ePortfolios facilitate the exchange of ideas and feedback. Students can receive feedback quickly and on a regular basis across electronic media channels throughout the ePortfolio development process.
- **Reflection**: ePortfolios encourage students to reflect on their work.
- **Psychological benefits**: ePortfolios can foster a sense of accomplishment and satisfaction among the students that use them.
- **Assessment**: As students revisit and refine their ePortfolios on a regular basis, they engage in an evaluation and assessment process. In doing this, students gain a better understanding of the assessment they are undertaking and can use it to constantly improve their learning outcomes.
- **Artefacts**: ePortfolios can be a repository for various artefacts including multimedia elements.
- **Maintenance**: ePortfolios are easy to maintain, edit and update.
- **Portability and sharing**: When saved online, ePortfolios can be shared with others and transferred into different working environment.
- **Access**: ePortfolios are easily accessible online by their authors. Students can also set privacy settings allowing selected audiences (e.g. peers, teachers) to look at their ePortfolio.
- **Cost**: Although ePortfolios require some initial set-up costs, mainly for software and equipment, the online tool is inexpensive and easy to reproduce in the long term.
- **Standardisation**: If a universal specification is agreed upon, ePortfolios have the potential to be standardised across e.g. provinces and countries.
- **Privacy**: ePortfolios include a privacy feature that protects student work. Access can be limited to only those that students wish to view their work.

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2. The Benefits of E-portfolios for Students and Faculty in Their Own Words (Winter, 2009), 11:1

1.4 Exploring ePortfolios in a European Context

Across Europe, the increasing interest in the potential for e-learning tools and technologies to support more learner-centred and personalised forms of learning has been driven by national strategies for e-learning and other initiatives to develop lifelong learning. Stemming from this interest, in 2006, all EU Member States agreed on a framework of eight Key Competences for Lifelong Learning (Council of the European Union, 2006). These include:

- Communication in the native language;
- Communication in foreign languages;
- Mathematical competences and basic competences in science and technology;
- Digital competence;
- Learning to learn;
- Social and civic competences;
- Sense of initiative and entrepreneurship, Cultural awareness and expression.

European countries are all at different stages of adopting these Key Competences into their national curricula, however the real challenge remains in the assessment methods and how education systems across Europe will evaluate the Key Competences in a fair and meaningful way.

The European Commission has described ePortfolios as ideally suited to the assessment of work-collections developed by students. The Commission also considers the ePortfolio to be a powerful tool for communication in a student’s native language, communication in foreign languages, cultural awareness and expression.

1.4.1 ePortfolio Policy-Adoption

EU Member States don’t have a structured and linear policy in terms of ePortfolio implementation. In many cases, ePortfolio adoption strategy is simply incorporated into the various ICT in education national policies or other strategies focusing on digital skills and/or teacher professional development.

ePortfolios have already been implemented in education systems in Belgium, Austria, Portugal, Romania, UK and Turkey. Bulgaria, Germany, France and Iceland are currently in an implementation pilot phase. In Portugal and the United Kingdom, e-Portfolios are available to students throughout their entire educational career and are assessed by awarding bodies.

Currently, we can observe the need to modernise school curricula across Europe in order to create a more learner-centred model of teaching. ePortfolios and their wide adoption in education systems can address this need significantly.

The main findings from the EUfolio project show that ePortfolio adoption across Europe can certainly progress the implementation of the strategic objectives of the ET 2020 (Education and Training within Europe 2020 strategy). ET 2020 aims to enhance innovation in education and the quality and performance of education systems.

For an in-depth exploration of ePortfolios in the EU context, please see the EUfolio deliverable; EUfolio Review of Existing ePortfolio Policies and Practices.

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5 Ibid.
Section 2: ePortfolios in a School Context

Section 2 provides an overview of the functions of ePortfolios and how these could be used to support teaching, learning and assessment, especially in a second-level context. It explores the potential of ePortfolios to support ongoing assessment and the development of key skills. Key considerations in the introduction of ePortfolio-based learning are also outlined.

2.1 Functions of ePortfolios

Based on a literature review, EUfolio partners identified three main functions of ePortfolios: **Storage** or “showcase of learning”; **Process** or “process of learning”; and **Product** or “products of learning”. These three separate functions - as mapped out in Figure 2.1 - support the learning process when interrelated and interdependent.

Himpsl-Gutermann (2012) explores these three functions in greater detail, referring to Products of Learning, Process of Learning and Representation of Learning. Reflection and feedback are key to linking the layers of this proposed ePortfolio structure.

![Figure 2.1 3 Layer ePortfolio structure Himpsl-Gutermann](image)

This three-layer structure is discussed in greater detail in the EUfolio deliverable; **EUfolio Process Specification**.

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Based on the information shown in Figure 2.1, the EUfolio partners developed the ePortfolio process illustrated in Figure 2.2, which display the three functions of ePortfolios and how they form part of the learning process. This is also indicated in the work of Abrami and Barrett (2005) with 3 levels of the ePortfolio process: repository, workspace and showcase.

Level 1: Student Repository

Students can use their ePortfolio space as digital storage, where they create and collect artefacts. They can also collate exemplars of work to support the development of success criteria for the task or assignment they are working on.

Level 2: Student Workspace

In the workspace, students can plan, set goals, organise learning experiences chronologically, collaborate with peers, reflect on their own learning process and on the work of their peers. They can collect and upload artefacts (storage), discuss with peers the selection of their artefacts, work collaboratively or alone and organise their resources. Thus, a cycle of self and peer reflection as part of the learning process is facilitated. In the workspace, teachers and peers can provide formative feedback.

Level 3: Student Showcase

The showcase element of an ePortfolio can demonstrate a student’s competences, achievements and products. A student can edit and select their artefacts to showcase their reflections and achievements as well as contributions and feedback from peers and teachers. The ‘final’ products in the showcase part of an ePortfolio can be evaluated by the teacher as a summative assessment of learning.

These functions of ePortfolios are further outlined in the EUfolio deliverable; EU Classroom ePortfolios Trainers’ booklet, available at the online CPD resources portal.
2.2 Using ePortfolios to Support Assessment

As outlined in Section 2.1, ePortfolios have three main functions and can support ongoing assessment.

2.2.1 ePortfolios and Summative Assessment

From a summative point of view, the platform acts as a digital repository (Level 3) for student work and has the capacity to store multi-modal texts. However, they also have the potential to support a shift in the role of the learner in this summative process from passive to active, as observed by Knight et al. (2006):

‘ePortfolios achieve a goal that many other assessment methods cannot; they change the student role in assessment from passive research subject to active participant as students are called upon to select samples of their classroom and co-curricular work products for the ePortfolios and (perhaps most importantly) to reflect upon why these artefacts were selected and how they demonstrate learning’.

This is supported by Kimball (2005) who underlines the shift in role for the student: ‘portfolio pedagogy seeks to encourage students to become dynamic participants in their own learning. Students are not merely users of the system, [they become] the authors of it’.

2.2.2 ePortfolios and Formative Assessment

ePortfolio pedagogy also has the potential to foster and develop formative assessment in the classroom. The platform supports feedback in the form of a dialogue, thereby building communication between the student and the teacher. This supports the notion put forward by Marshall and Wiliam (2006) that the purpose of formative assessment is to support learning and that the process of feedback should engage both the teacher and the student.

Below, Figure 2.3 captures the process of how students typically develop their work; in this case a piece of student writing in the ePortfolio platform. This development process features all three functions of ePortfolios: Level 1, Level 2 and Level 3.

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At Level 1 (student repository) the student can store exemplars of work. This work can be used to generate success criteria; the standards by which work will be judged when finished, to determine its success in the eyes of the student and the teacher.

At Level 2 (student workspace) the student is engaged in the creation process while in the student workspace, and can seek feedback from peers, teachers, parents and engage in self-reflection.

Once the process is completed, the student can demonstrate their learning at the product stage, and display their product in their showcase (Level 3).

2.2.3 Effective Feedback

In 2011, the Scottish Qualifications Authority study into effective assessment practice found that ‘ePortfolios make it easier for teachers and assessors to give feedback, which strengthens the link between formative and summative assessment and between learning and assessment generally’. 11 The platform allows for feedback in both written and oral formats and can include links to exemplars of work.

Feedback can be provided at any stage in the learning process, and this supports the development of the student, as noted by Black & William (1996); ‘continual feedback to students on how to progress learning and performance is essential...feedback must be during the process and not just at the product stage’. 12 Examples of feedback throughout the process can be seen within the EUfolio project where teachers provided both oral and written feedback to students in an effort to support students’ learning journey.

2.2.4 Peer Feedback

ePortfolios present an opportunity to increase peer-to-peer dialogue and peer assessment. Stefani et al. (2007) observe that ‘Peer-commenting on student work is an excellent incentive for improving the quality and effort that students invest in their work. Furthermore, those who comment learn as much from devising their comments as those who receive feedback on their work’. 13 The ePortfolio platform enables quick and easy sharing of student work, either with individual students or groups, and in this way facilitates peer feedback throughout the learning process. This is shown in exemplars from the EUfolio classroom ePortfolio implementations on the EUfolio CPD resources portal.

2.2.5 Student Self-Assessment

An ePortfolio also provides a platform for student self-assessment. It assists the student in taking control of their own learning and becoming more autonomous. This idea is supported by the research of Black et al. (2004); ‘Self-assessment promotes the capacity to work at a metacognitive level...engaged in self-reflection, students begin to develop an overview of their work that allows them to manage and control it for themselves’. 14

This ongoing assessment compliments the digital repository potential of the ePortfolio. In terms of in-school summative assessment, engagement with the repository of work in ePortfolios becomes a process that is led by the student. As described by Klenowski, Askew and Carnell (2006), ‘It avoids the trap of gathering a ‘collection’ of data; the emphasis is on noticing and analysing learning and allows [students] to examine their own learning and meta-learning strategies’. 15

Students involved in the EUfolio pilot reflected on their learning throughout the process of completing a task or assignment and engaged in metacognition and thinking about their learning. Throughout the duration of the project, students were able to record their reflections in the ePortfolio platform to support future learning.

To support student-self assessment, the ‘My Learning’ plugin was developed for the Mahara platform. This fosters student reflection and self-assessment thereby promoting self-directed learning. An overview of the features of My Learning is provided in Appendix 3.

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2.3 Using ePortfolios to Develop 21st Century Skills

Curricula and teaching approaches have changed over the past decade to run in line with altered job requirements and societal trends. This is in an effort to narrow the current gap between the world of education and the world of work. EUfolio partners examined a number of 21st Century Skills and competences which could potentially be developed through the use of ePortfolios in the classroom. The project focused on the skills outlined in the ATCS Framework (2012) which groups 21st Century Skills into four categories as seen in Figure 2.4.

<table>
<thead>
<tr>
<th>21st century skills (ATCS)</th>
<th>Description – Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creativity / Innovation</td>
<td>• To be able to create new and worthwhile ideas</td>
</tr>
<tr>
<td></td>
<td>• To be able to work creatively with others</td>
</tr>
<tr>
<td></td>
<td>• To be able to implement innovations</td>
</tr>
<tr>
<td></td>
<td>• To be able to elaborate, refine and analyze one’s own ideas</td>
</tr>
<tr>
<td>Critical thinking / Problem solving / Decision making</td>
<td>• To express thoughts and ideas effectively, using any type of communication (oral, written, artifact, technology etc.) in several contexts and for a range of purposes</td>
</tr>
<tr>
<td></td>
<td>• To be able to listen to other’s thoughts and ideas</td>
</tr>
<tr>
<td></td>
<td>• To share opinions and provide feedback</td>
</tr>
<tr>
<td>Learning to Learn / Metacognition</td>
<td>• To use several types of reasoning in appropriate situations</td>
</tr>
<tr>
<td></td>
<td>• To use systematic thinking by considering the interaction of the small parts of the whole problem in order to solve it</td>
</tr>
<tr>
<td></td>
<td>• To make decisions and judgments</td>
</tr>
<tr>
<td></td>
<td>• To critically evaluate online and other resources using</td>
</tr>
<tr>
<td>Collaboration</td>
<td>• To interact effectively with others</td>
</tr>
<tr>
<td></td>
<td>• To work effectively in diverse teams</td>
</tr>
<tr>
<td></td>
<td>• To manage group projects</td>
</tr>
<tr>
<td></td>
<td>• To guide and lead others (having a respectful behaviour)</td>
</tr>
<tr>
<td>Communication</td>
<td>• To be able to communicate in oral or written form in their mother tongue and additional language</td>
</tr>
<tr>
<td></td>
<td>• To be able to read and understand different texts</td>
</tr>
<tr>
<td></td>
<td>• To be able to formulate arguments in a convincing matter</td>
</tr>
<tr>
<td></td>
<td>• To develop skills to use aids (such as notes, schemes, maps etc)</td>
</tr>
</tbody>
</table>
These 21st century skills need to be incorporated to a greater extend into the curriculum in order to overcome current and emerging practical skills shortages. ePortfolios provide a platform to support the development of these 21st Century Skills using technology as a catalyst for the development of these skills which is important in the development of student-centered learning.

The point that ePortfolios can support 21st Century Skills is fortified by the research findings of the EUffolio project, which show that student keys skills such as creativity, critical thinking, learning to learn, communication, collaboration and ICT literacy evolved throughout the pilot implementation.
2.4 Key Considerations in Implementing ePortfolios

The EUfolio partners considered two key perspectives, pedagogy and technology, when implementing ePortfolios. These are outlined in Figure 2.5 below and are further explored in the EUfolio deliverable; Generic Functional Specification.

**Figure 2.5 Key Considerations of ePortfolio Implementation**

2.4.1 Pedagogical Perspective

Schools involved in the EUfolio project explored the potential of ePortfolios to support teaching, learning and assessment in the classroom across the three levels of ePortfolio functionality as outlined in Section 2.1. ePortfolio functions - supporting student reflection, formative assessment, peer assessment and showcasing student work - were embedded in the learning process. In order to support these functions, teachers developed learning scenarios that incorporated an ePortfolio pedagogy.

2.4.2 Technological Perspective

The ePortfolio system needs to meet the demands of all users within the school environment; it needs to be reliable, secure, resilient and flexible. Schools should focus on how they will use ePortfolios and meet user-expectations before they consider the technical or functional characteristics of ePortfolio software systems.

Schools should consider the technology requirements that are necessary for the operation of ePortfolios (e.g. technical set-up, implementation or maintenance). The EUfolio deliverable; Generic Functional Specification provides a set of technical-level requirements for ePortfolio implementation, to help ensure that the implementation can be achieved on time and on budget. Essential “must-have” elements are distinguished from “nice-to-have” elements, depending on the type and targeted use of the ePortfolio project.

The usability of ePortfolios in schools should also be considered, where their capacity can be explored, developed and expanded upon as time goes on. **Figure 2.6** outlines the levels of ePortfolio development in schools. As the levels progress, the emphasis moves from the learner to implementation challenges for the school.
While an ePortfolio solution could be delivered initially as a simple student webpage or blog, over time this may become unwieldy for the school to manage. In order to achieve maximum impact, schools need to consider what the ePortfolio system will look like in the future when it is implemented across the whole school, for all students and subjects.

Ideally, the learner will have the ability to bring their ePortfolio with them when they leave the school, thus providing lifelong learning application and opportunities.

**Figure 2.6 Levels of ePortfolio development in schools (adapted from Siemens 2004)**

2.5 Functional Requirements Matrix

Having explored the technological and pedagogical perspectives of an ePortfolio implementation, EUfolio partners developed a Functional Requirements Matrix based on the work of Hartnell-Young et al. (2007) and Becta (2009). This matrix, captured in figure 2.7, presents six functional modules that should be supported by a learner-centered ePortfolio platform. These are Core Functions, Planning, Learning & Development, Reflection & Monitoring, Assessment & Transition, all of which are focused on the student and their work.

These functional modules are mapped onto the four functions of portfolios identified by Baumgartner (2009), which are; Reflection Portfolio, Presentation Portfolio, Assessment Portfolio, Development Portfolio. The resulting matrix illustrates the set of functional requirements considered relevant for ePortfolios in the context of the EUfolio project.

Figure 2.7 EUfolio Functional Requirements Matrix

The functional requirements matrix is explored in greater detail in the EUfolio deliverable; Generic Functional Specification.
2.6 Developing a Model of ePortfolio Implementation

In order to develop a strong model for the integration of both pedagogical and technological perspectives, EUfolio partners explored models of ePortfolio implementation in education systems across numerous countries. Partners then proceeded to develop an implementation model for schools, which is derived from the six-step process proposed by the UK-based Joint Information Systems Committee, (JISC, 2008).

![Diagram of the six steps to ePortfolio implementation](image)

**Figure 2.8 Six Steps to ePortfolio Implementation**

The JISC implementation model (Figure 2.8) is guided by a number of principles including clearly defining the purpose of the ePortfolio at the outset and understanding the implications of ePortfolios for both pedagogical and technological practitioners. Prior to implementing ePortfolios in the classroom, it is essential to engage in a preparatory phase to ensure that teachers are confident about embedding ePortfolios into teaching and learning and to ensure that learning scenarios support the integration of ePortfolios in teaching and learning.

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In order to constantly optimise the way ePortfolios are implemented, an ongoing monitoring process should take place, inclusive of a review at the end of the pilot implementation. The results of this review will inform future implementations.

Drawing from the findings of the EUfolio project, the JISC model was further developed into the EUfolio Ten-step Guide to ePortfolio Implementation (Figure 2.9). This Guide introduces ePortfolios through discussion and training. It features monitoring and implementation assessment to inform further review and improvement throughout the process.

EUfolio Project findings showed that school/teacher/student preparation and teacher/student development and support were essential in bringing about a successful ePortfolio implementation. This Ten Step Guide is explored and discussed in greater detail in Section 3.4.

Figure 2.9 EUfolio Ten Steps to ePortfolio Implementation
Section 3: EUfolio Pilot Implementation Results

The EUfolio pilot project implementations were carried out by the following five European countries: Cyprus, Ireland, Lithuania, Slovenia and Spain.

3.1 Short Description of the Implementations

The five pilot countries followed a common implementation approach, as described in the partners’ pilot evaluation report:

- Design & facilitate continuing professional development (CPD) for participating teachers on the pedagogical aspects of ePortfolios in education and the technological aspects of the platform to be used.
- Use trainers/mentors/researchers to support participating teachers during the implementation phase with face-to-face visits in schools and online support.
- Collect data from participating schools in order to address the EUfolio project research questions.

The EUfolio project’s classroom ePortfolio implementations were expected to be diverse and therefore it was important to ensure that a robust research design was used in order to collect and analyse data. The participants of those implementations ranged from EUfolio country team members to school teachers and students who were involved in the pilot testing process.

3.2 Data Collection

The participating countries used a mixed-methods approach to gather both qualitative and quantitative data in an effort to answer the EUfolio research questions.

Depending on how their pilot was designed, each of the countries used particular data collection instruments found in the EUfolio Data Collection Toolkit - a resource used throughout the pilot. The Toolkit included questionnaires (pre and post implementation) for participating teachers and students; focus group questions; researcher diaries protocols and classroom observation protocols.

The individual country reports were then reviewed and analysed in order to inform the internal evaluation report. A summary of the results of all piloting countries implementations can now be explored.
3.3 Summary of Results

In order to properly implement ePortfolios in their classrooms, teachers who participated in the EUfolio project reported a change in the way they planned and designed their lessons. Although some teachers stated the integration of a platform to accommodate their students’ ePortfolio development did not require them to change their teaching methodologies, the majority of the teachers needed to take several factors that affected their teaching into consideration. These factors include:

- learning design modifications
- planning and design of their lessons
- providing feedback out-of-school time
- multimedia management
- interactivity and clarity
- sharing of learning goals with students.

The fact that the majority of the implementing teachers stated that they would continue with future ePortfolio implementation in their classrooms, indicates that ePortfolios had a positive impact on their teaching.

Piloting teachers also reported that their learning design’s cognitive goals were achieved through the implementations and that their students had developed 21st century skills throughout the process, with emphasis given by countries on students’ reflective skills.

Teachers also stated that the implementation of ePortfolios increased their students’ engagement and motivation and highlighted the fact that students’ engagement in the platform seemed to enhance the quality of communication within the classroom. ePortfolio implementations helped teachers to assess their students’ work on an ongoing basis, and in particular to enhance teachers’ formative assessment processes.

Some teachers claimed that ePortfolios helped them assess their students’ 21st Century Skills, however, there is not enough overall evidence to suggest this is a project finding.

A short summary of the pilot results, along with conclusions drawn from the pilot country reports are presented in the EUfolio document, Pilot Evaluation Results.

3.4 Use of ICT & ePortfolios in Schools

According to EUfolio participants’ evaluation reports, the use of an ePortfolio gave a new impetus to the use of ICT in their teaching, learning and assessment practices.

Pilot-testing teachers reported that by using ePortfolios in their classrooms, they increased the use of ICT in general and helped their students develop digital skills. In addition, teachers stated that during the process of developing ePortfolios, students and teachers interacted through the platform and increased their communication in and out of school since they could access the platform in out-of-school timetables.

Overall, based on their experiences of classroom implementations, teachers and principals listed several suggestions to ensure the successful future use of ePortfolios. Specifically, teachers highlighted the importance of having appropriate infrastructure in the school and ensuring out-of-school access for students to develop their ePortfolios. In addition, teachers stated that the time devoted to training students to use an eportfolio should be longer. Some of them suggested that ePortfolios should be used in primary education (the EUfolio project’s pilot implementations only took place in post primary schools).

All teachers strongly stressed the importance of ensuring appropriate preparation for teachers and students through practical professional development and training prior to implementation, and sound ongoing pedagogical and technological support during the implementation process. Some teachers also put emphasis on the integration of curriculum content into the ePortfolio platform in order to bring further enhancements and facilitate future implementations.

Some others stated that the sense of belonging in a community was important for them as they could discuss their work with peers. For this reason, there were teachers who suggested expanding the implementations by deciding on a common platform to be used in a given country and informing and convincing other teachers to utilise ePortfolios with evidence-based research.
3.5 EUfolio Project Challenges

The EUfolio ePortfolio model, where learning was approached as both process and a product, provided clear indications of ePortfolio benefits in teaching, learning and assessment. The use of an ePortfolio as a learning process offered teachers and students opportunities to achieve their learning goals. However, there were a number of challenges that significantly affected its implementation:

- Teachers believed that they were successful in achieving cognitive goals and in developing 21st century skills but there is insufficient evidence to support their assertions. A significant change in the way they assessed their students was not evident. Most teachers stated that the formative assessment of their students' work was facilitated by the use of the ePortfolio but they did not adequately describe the way they assessed their students formatively. There were teachers who admitted that they needed further guidance on evaluating and assessing students' work in their ePortfolios and noted particular difficulty in assessing the 21st century skills of their students.

- It is important for teachers to have sufficient levels of pedagogical and technological support before, during and after the ePortfolio implementation. Even after the implementation process had concluded, there were teachers who were still confused regarding pedagogical aspects of the ePortfolio approach.

- Teachers, especially the ones who are not familiar with using ICT in their classroom, need to have time to familiarise themselves with, and receive continuing professional development (CPD) to efficiently utilise the chosen platform before implementations.

- ePortfolios need to be aligned with the country's curriculum to ensure smooth implementation. The project's findings suggest that the presence and involvement of ICT coordinators and/or ICT teachers are essential during the implementation process. They should provide technological support and help to develop the required skills in students and other teachers within the school.

- EUfolio project findings suggest that in order to ensure successful integration of ePortfolios in formal education at national level, a common ePortfolio platform is desirable, so that ePortfolios can be used across all schools in a particular country.

- It was evident in EUfolio schools that students need to have time to develop their ePortfolios for long periods of time and that the use of an ePortfolio should be a feature of school life and not for a specified duration. It was suggested that the ePortfolio-use should start in primary education and continue to develop in second level education.

- Appropriate infrastructure, such as number and age of computers, mobile devices, internet connection and access for all students, was a significant factor in the implementation process, and the lack of it was shown to be a barrier to the successful classroom implementations.
3.6 Guidelines for Schools

The results of the EUfolio pilot implementations pointed to several preconditions for the successful implementation of ePortfolio initiatives in schools. The following ten-step guidelines were developed using the lessons learnt from the EUfolio project.

**Step 1: Establishing the purpose/type of the ePortfolio initiative**

The EUfolio pilot countries implemented ePortfolios in schools using specific types of ePortfolios according to the purpose and needs of each country. For example, some countries used Reflective ePortfolios, others used Group ePortfolios whereas others used Individual ePortfolios.

Before implementation, deciding on the type and purpose of a particular ePortfolio is an important step, as this affects the pedagogical and technological content of the teacher-training. It also affects the platform selection and setup, the assessment methods to be used by the teachers and the overall implementation.

A more in-depth exploration of ePortfolio purposes and types is presented in the EUfolio deliverable; EUfolio Review of Existing ePortfolio Policies and Practices.

**Step 2: Setting the functional specification of ePortfolio implementation**

After deciding the purpose and type of the ePortfolio, the school should start outlining the functional specifications of the platform that is to be used. The school should start considering the infrastructure needed. In addition, schools should start considering the roles that school staff should play during the implementation.

A more in-depth exploration of an ePortfolio implementation functional specification is described in the EUfolio deliverable; Generic Functional Specification.

**Step 3: Selecting and planning operations and platform to be used**

The school's selection process of the platform that will be used to support the ePortfolio implementation is important. There are many options available online varying from simple webpage creators, blogs, to open source ePortfolio or commercial ePortfolio systems. In the EUfolio pilot project, two platforms were used; the open source platform Mahara and Microsoft's Office 365 solution. Other platforms may be considered by schools.

EUfolio teachers identified some advantages of the platforms used; repository space, opportunities for sharing students' work, interoperability on several devices, user-friendly interface, safe and secure environment and unrestricted access for students, sustainability of students' access.

**Step 4: Providing CPD for teachers**

Designing and facilitating comprehensive CPD for participant teachers is perhaps one of the most important considerations a school needs to make in order to ensure successful implementations of ePortfolio initiatives. Almost all EUfolio teachers indicated that participating in both pedagogical and technological CPD programmes is essential for a successful implementation. For a more in-depth exploration of the way EUfolio teachers were supported during the EUfolio project and related professional development material, please refer to the online CPD resources portal.

**Step 5: Supporting the teachers**

It was evident from the data analysis of the pilot implementations that the EUfolio teachers wanted continuous pedagogical and technological support from EUfolio CPD teams, mentors and ICT coordinators/teachers before and during the implementation process.

Teachers also highlighted the importance of belonging to an ePortfolio implementation community (face-to-face and online) in their school. Thus, it is important to ensure that implementing teachers are supported both pedagogically and technologically by having access to print and online CPD resources and by participating in communities and having individual and personal support from mentors and other ePortfolio experts who are identified at national level.

A more in-depth exploration of the way teachers were supported during the EUfolio project is available in the EUfolio CPD resources portal. Interested teachers can also register on the EUfolio peer-to-peer online network of pilot schools and
teachers at www.yammer.com/eufolio for further discussion and feedback.

Step 6: Training the students

Teachers who were developing their own skills with regard to ICT-use in their classroom seemed to be overwhelmed when it came to training their students to use ICT.

EUFolio teachers suggested that students should be adequately trained by ICT experts or people experienced in ICT-use in order to be able to develop their ePortfolio technically, before developing their ePortfolio for the specific curriculum subject requirements.

In technical terms, the majority of students in the EUFolio project seemed to navigate quite well between the various sections in the platforms used and demonstrated a high level of technical acumen. However, in terms of the reflection element of their ePortfolios, students struggled more. This means they missed out on insights into their own learning process and demonstrates that students need scaffolding and sufficient theoretical training before and during the ePortfolio implementation process in addition to technological training.

Step 7: Aligning the use of ePortfolios with the national curriculum

Many teachers expressed their worries in respect of the time-consuming nature of their initial pilot implementations and suggested an alignment and integration of the ePortfolio approach with national curriculum content.

Teachers should change the way they design their lessons in order to integrate ePortfolios. For example, modifications to lessons are necessary due to the out-of-school access to their ePortfolios by students, planning and booking of ICT rooms (if needed) and considerations of the future development of 21st century skills need to be made.

Step 8: Implementation in the classroom

Teachers highlighted the importance of sharing the learning design and lesson-goals with their students before and during the implementation, since one of the aims of an ePortfolio approach is developing students’ self-regulation and goal-setting skills. Thus, it is essential to plan for and organise the use of an ePortfolio implementation both inside and outside of the classroom in order to support students’ individual and self-regulated work and pace.

Students’ activities should be chosen to ensure that students will document their learning through any platform that is being used and teachers need to make sure that students have access to a computer or mobile device and internet connection to continue with the development of their ePortfolios.

One of the main issues most EUFolio teachers faced was related to the lack of appropriate infrastructure that restricted students’ activities and hindered the implementations. You can find learning designs and examples of ePortfolios in the EUFolio CPD resources portal.

Step 9: Monitoring the implementation

The assigning of a mentor/expert on ePortfolios who was made available to teachers during the project was found to be important. This expert would also properly oversee the implementation process. This helps to identify the difficulties early in the implementation process and ensure that technical and pedagogical issues are resolved.

Step 10: Assessing the implementation

It is important to follow the whole implementation process of the ePortfolio from the beginning, as well as the final outcomes. During the implementation process, data can provide feedback for improvements that can be made in elements that were not taken into consideration in the early stages.

The final outcomes along with the implementation process data will help the whole school to understand the restrictions and the opportunities that arise from the use of ePortfolios. We propose using a mixed-methods approach to collect data using both quantitative and qualitative methods from both teachers and students (and other people involved), in order to be able to answer questions that are important to the school for the ePortfolio initiative.

The EUFolio Data Collection Toolkit includes several data collection instruments that could prove useful for schools.
Section 4: Summary of Considerations for the Implementation of an ePortfolio Model at National, Regional and School Level

This section summarises the issues for consideration when implementing eportfolios at national, regional or school level. These considerations are based on research and the findings from the EUfolio project.

4.1 Guidance at Three Levels

Guidance and advice for implementation of ePortfolios is required at three education-sector levels:

- National
- Regional
- School

4.2 National Level Considerations

National policy on the use of digital technology in education and current curricular priorities should be taken into account before deciding on whether ePortfolios should be introduced. The development of ICT environments and tools at school level must holistically support curricula and be consistent with policies in this area. A national policy that recognises and supports innovative use of technology in the classroom will facilitate the implementation of ePortfolios at regional and school level.

Policymakers should encourage the development of ICT environments and tools that allow teachers to quickly, easily and flexibly create customised electronic teaching, learning and assessment environments. Where possible, Ministries for Education should promote and encourage research in the area of assessing key competences for 21st century learning so as to develop new technological solutions. At national level, the benefits of ePortfolio usage at different levels whether regional or schools level, should be promoted.

Resources to inform and guide regions and schools on implementation of ePortfolios should be made available by national policymakers. These resources should include case studies and scenarios as a tool to support decision-making in order for all stakeholders to better understand the role ePortfolios can play in the classroom.

The successful implementation of an ePortfolio model also requires teachers to have a certain level of digital literacy (knowledge and expertise of areas that are not traditionally associated with teaching practice) for example, intellectual property rights, security and privacy and so on. It is suggested that national policymakers compile detailed advice and checklists for use in regional or school implementations as well as parallel professional development opportunities for teachers.
4.3 Regional and School Level Considerations

To ensure that the ePortfolio model matches the particular needs of the education system, it is recommended that pilot implementation projects are conducted to gather additional evidence-based information before large-scale implementation. The results from pilot implementation should provide regions and schools with the necessary knowledge to implement their own systems safe in the knowledge that the piloted ePortfolio models are suitable for their context.

The pilot should collect results from the implementation using various methods (questionnaires, observations, exemplar ePortfolios, rubrics, forums, focus groups with different stakeholders). A range of such templates are available on the EUfolio CPD resources portal.

Please note that results should be documented in a structured way in order to provide a summary of what went well and what needs improvement.

4.4 Implementation Issues to Consider

One of the main considerations when implementing ePortfolios is the availability of appropriate professional development for teachers. This is an evolving area and there is a lack of professional practice knowledge at present so teachers should be encouraged to network and exchange good practice. This can be at a national, regional or school level.

Many of the ICT-enabled assessment practices within schools are promoted by a small number of teachers who enthusiastically and crucially engage with ICT for assessment. To establish good practice, and to mainstream ePortfolios it is necessary to support teachers, encourage them to exchange their experiences, establish good practice and a peer-review mechanism.

Other issues for consideration are levels of interoperability between systems, ownership and intellectual property rights and security and privacy. These issues are expanded upon below.
4.5 Ensuring an Effective ePortfolio System

There are a number of issues that need to be taken into consideration in order to set up an efficiently-working ePortfolio system in European classrooms. These steps are appropriate for all levels of implementation at national, regional and school level.

1. Systematic review

Set objectives and decide approaches:

- Identify existing policy statements pertaining to the use of an ePortfolio in your region or school;
- Consider positive and negative aspects of ePortfolio policy implementations;
- Identify key policy decisions;
- Review successful ePortfolio implementation strategies;
- Summarise lessons learned.

2. Assessment strategies

Define the assessment strategy for implementing ePortfolios on a large-scale concentrating on the following topics:

- Determine the curriculum and assessment objectives along with the teaching, learning and assessment processes;
- Determine the subjects/courses to be included in the ePortfolio;
- Determine the ePortfolio design, covering the range of issues which need to be addressed;
- Specify for the main functional elements of an ePortfolio deployment in schools with different levels of capacity.

3. Capacity needs

Document the objectives for implementation including:

- Policy priority;
- Learning context (curricular subjects, short courses, learning objectives, key skills, subject knowledge, lifelong learning/personal development, etc.);
- Professional development needs;
- School management needs (stakeholder briefings etc.);
- Learning materials/artefacts, models and demonstrations, teaching aids, etc. needed;
- Expected outcomes.

4. Operations planning

Outline operational plan for implementation including:

- Selection of appropriate piloting groups within schools;
- Assessment strategy, plan and materials needed;
- Professional development plan;
- School management plan;
- Classroom/pedagogy plan;
- Platform strategy and plan (functions and supports to be made available to each party);
- Legacy plan (artefacts and capacity to outlive the implementation);
- Implementation plan and responsibilities;
- Quality and evaluation plans.

5. Platform planning

Deploy technology platforms including:

- Detailed design;
- Development;
- Modular testing;
- Integration, configuration and installation;
- Final testing.

6. Piloting and quality assurance

- Conduct a pilot to gather evidence based information before large-scale implementation;
- Collect products from pilot implementation using various ways (questionnaires, observations, exemplar portfolios, rubrics, forums, focus groups with different stakeholders);
- Document results in a structured way in order to provide a summary of what went well and what needs improvement;
- Discuss the results on different levels in order to enrich the outcomes usability;
- Adapt and make changes for future large-scale implementation, if needed.

This above guidelines contain useful eportfolio implementation questions and also a checklist (See Appendix 1) to assist in implementation. These documents are particularly useful at school level.
In order to adequately facilitate for future economies of scale and standards of work, modes of learning should be multi-faceted, interactive and fast-paced. Additionally, today’s student demands a personalised learning experience that extends beyond traditional boundaries to include social networks of peers, teachers, professionals and even external experts.

Across Europe, ePortfolios are being recognised as conduits of these new requirements of learning; as both highly individualised self-assessments and as evidence of student accomplishment. ePortfolios - when used as a product and process - are a tool that enable learning by reflection and lifelong learning. They also facilitate for ongoing formative and summative assessment methods where teachers can examine and improve classes and programs based on student achievement, clearly defined learning objectives and standards.

This Guide shows policymakers and practitioners how to prepare for, facilitate, implement and evaluate ePortfolio systems within individual schools, as well as regional and national levels. Ideally, it should inform the implementation of many ePortfolio systems across Europe in the future. However, as the demand for the implementation of ePortfolios grows, it is essential to constantly monitor and document improvements and advancements, (one way to do this is through the practice community, Yammer) as well as challenges encountered along the way in order to smooth out the implementation process for future users of ePortfolio systems. The better the alignment between ePortfolio models to specific purposes and needs, the smoother the implementation process.
Appendix 1 - ePortfolio Implementation Considerations

This checklist was developed as a guide through the ePortfolio implementation process for schools. It is derived from the JISC Implementing ePortfolios Checklist. Further implementation guidelines are available in the EUfolio deliverable; EUfolio Process Specification.

### Teaching Practice

- What is the purpose of the ePortfolio?
- What learning objectives will be considered?
- Who is the primary audience of the portfolio?
- What is the role of teachers and learners?
- How will learners learn how to reflect effectively on their work?
- Who will provide feedback on the quality of reflections?
- How is the ePortfolio going to be assessed (for assessment portfolio)?
- How are the results going to be linked to the curriculum (For assessment portfolio)?

### Quality Assurance

- What are main activities ensuring assessment transparency?
- How to ensure internal and external verification of assessment?

### Ownership and IPR

- How will the ePortfolio system authenticate that all the work, documentation and demonstrations were created by the author?
- Who is the real owner of the artefacts in the ePortfolio file repository?
- How will intellectual property used in an ePortfolio be protected?
- What can or cannot be included in an ePortfolio?
- Who owns the learner record (transcript)?

Appendix 1 - ePortfolio Implementation Considerations

### Security and Privacy

- What policies need to be in place for governing information access, security and privacy? How will they be controlled?
- How will Data Protection Act agreements be ‘signed’ on a larger scale?
- What are the issues associated with pre-18 year olds using the system?
- What progress can be made with a unique identification number?
- Can the system maintain a high level of security? It means to keep personal data secure and free from hacking?

### Development and Support

- Who will provide staff support and development?
- Have teachers been consulted about the type of development they would like?
- What are the roles of teachers and what are the roles of support staff, for example, careers advisors for the ePortfolio implementation?
- Who will show learners how to use the system?
- Will there be an institutional programme or will it remain the responsibility of the teacher?
- How likely is it that learners will accept and use the ePortfolio system?
- Will the system be user-friendly enough for adoption?

### Hardware and Software

- How will the integration of the school management information system (MIS) or virtual learning environment (VLE) with the ePortfolio be dealt with and by whom?
- Can the server performance and storage be scaled up to cope with increasing numbers of ePortfolio users and the growing size of the ePortfolios as users expand them over time?
- What plug-ins, file formats and browsers will be required or supported?
- What technologies will be used to implement an offline, portable ePortfolio that authors can take with them?
- What back-up systems are in place to ensure operational integrity and disaster recovery?
- Is the ePortfolio system easy to use? A simple interface, easy to upload, display and edit information, requires minimal teacher supervision in maintenance of the system?
- Are resources easily accessible by students to update their ePortfolio?
- Is the system accessible by stakeholders such as teachers, peers and parents to view/feedback/evaluate?
- Can the system accommodate multiple formats?
- Is it possible to upload different media like text, graphic, audio, video clips, files, databases, virtual reality, etc. can the ePortfolio content be readable by or exportable to other systems?
- How will data entered for ePortfolio purposes be utilised in other ways and by other systems?
Support and Scalability

- Will there be an infrastructure in place to properly train learners and administrators how to use the ePortfolio system?
- Will there be adequate online help or will a staffed help desk be required?
- How will information be maintained over time?
- What policies are needed for transporting or deleting ePortfolios?
- How will long-term storage requirements be managed?
- Can the system scale adequately as its usage grows and storage expands?
- Will there be adequate staff to develop, deploy and maintain the system?
Appendix 2 - EUfolio Pilot Implementation Overview

The aim of EUfolio project was to pilot ePortfolios models in European education settings so as to inform and support the implementation of innovative learning-environments in classrooms using ICT.

Throughout 2014, classroom ePortfolio implementations were carried out in schools in five piloting countries: Cyprus, Ireland, Lithuania, Slovenia and Spain (Galicia).

Pre-Pilot

The EUfolio train-the-trainer workshop in October 2013, hosted by Danube University, Krems and organised by the Cyprus Pedagogical Institute, introduced school mentors from piloting countries to the EUfolio project. These mentors were provided with ePortfolio CPD resource materials and recommendations for their in-classroom use.

From November 2013 to January 2014, teachers from the pilot schools attended a number of CPD workshops in preparation for the pilot phase. They were introduced to the concept of ePortfolios for formative assessment and developed their own ePortfolios. They planned the use of ePortfolios with their pilot class groups and agreed on introductory activities for the pilot commencement January/February 2014.

Piloting in Schools

In all, 72 schools participated in the pilot during 2014. The pilot implementation was carried out in two phases: Phase 1, January to May 2014; and Phase 2, September to December 2014. Schools were given access to a choice of two ePortfolio platforms for use in the pilot and support was provided to set up teacher and student ePortfolio accounts where necessary. Examples of learning activities were provided throughout the piloting phase, along with suggested implementation paths to take, based on the EUfolio generic and functional specifications. See the below table for a detailed account of the pilot figures.

<table>
<thead>
<tr>
<th>Country</th>
<th>Number of schools</th>
<th>Number of teachers in CPD</th>
<th>Number of piloting teachers</th>
<th>Number of students in pilot classes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyprus</td>
<td>6</td>
<td>31</td>
<td>18</td>
<td>342</td>
</tr>
<tr>
<td>Ireland</td>
<td>26</td>
<td>54</td>
<td>50</td>
<td>1,325</td>
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<tr>
<td>Lithuania</td>
<td>10</td>
<td>42</td>
<td>20</td>
<td>441</td>
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<tr>
<td>Slovenia</td>
<td>15</td>
<td>78</td>
<td>73</td>
<td>807</td>
</tr>
<tr>
<td>Spain</td>
<td>15</td>
<td>31</td>
<td>33</td>
<td>1,183</td>
</tr>
<tr>
<td>Total</td>
<td>72</td>
<td>236</td>
<td>194</td>
<td>4,098</td>
</tr>
</tbody>
</table>
**Pilot Implementation**

Depending on the way their implementations were designed, pilot countries used data collection instruments provided by the EUfolio Data Collection Toolkit. The Toolkit included several instruments such as pre- and post- questionnaires for participating teachers and students, Focus Group questions, Researcher diaries protocols and Classroom observation protocols. The pilot countries used both quantitative and qualitative methods in order to compile their country's individual pilot evaluation report addressing the research questions of the EUfolio project:

- What was the impact of using ePortfolio on teaching, learning and assessment in the country?
- How can the employment of ePortfolio models facilitate learning with the use of ICT for teachers and students of the country?
- What key policy decisions and implementation activities (action plans) are required for ensuring the successful implementation of the ePortfolio strategy in the country?
- What are the key specifications required for designing ePortfolio models?

Exemplar student ePortfolio and school case studies from the pilot implementation are available in the EUfolio CPD resources portal.

**Pilot Evaluation Results**

The EUfolio document, Pilot Evaluation Results, summarises the experience of pilot classroom implementations and shares the results of the pilot implementations. The results were composed after reviewing and analyzing piloting countries' individual reports. For each research question, data provided by the country reports was compiled in order to illustrate participating teachers (and students) statements and experience while implementing ePortfolios in their classroom. The document addresses each of the EUfolio research questions using data from all piloting countries.
Appendix 3 - Mahara ‘My Learning’ Plugin

The My Learning plugin was developed for the Mahara platform to support student self-reflection and self-assessment and promote student autonomy and self-directed learning. The My Learning tab appears in the content section of the student’s ePortfolio and has five separate elements.

Rupnik Vec and Novak (2014) outline the five elements of the My Learning plugin:

- Prior Knowledge
- Learning Goals
- Learning Strategies
- Evidence of Learning
- Self-evaluation

The student completes the prior knowledge, learning goals, learning strategies and evidence of learning sections in advance of the assignment or task. The final section (self-evaluation) is completed after the task.

Prior Knowledge

Clarke (2008) and Pintrich (2005) discuss the importance of recognising prior learning and prior knowledge in the learning process. The student uses this section of the My Learning tab to reflect on and record their prior knowledge. In reflecting on their prior knowledge, students engage in a cognitive process which supports setting individualised learning goals.

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Learning Goals

Hattie and Timperley (2007) propose three questions to guide student learning. These are:
• Where am I going?
• How am I going?
• Where to next?

The first question ‘Where am I going?’ refers to learning goals. Students should ask the question to identify what they intend to learn during a particular assignment or task and record these learning goals. Learning goals link with success criteria and provide students with a roadmap for their learning journey.

Learning Strategies

These relate to Hattie and Timperley’s second question ‘How am I going?’ Students should create success criteria, which can be done in collaboration with the teacher or peers for the assignment or task and use these to develop a strategy for planning their learning. This strategy refers to how the student will plan their work, taking their own prior learning and learning goals into consideration.

Evidence of Learning

Evidence of learning is used by the student to demonstrate his/her learning. In this section of the My Learning tab, the student documents how they intend to record their learning and show how they have achieved their learning goals.

Self-evaluation

Black and Wiliam (1998) note that self-assessment by pupils is an essential component of formative assessment. In the self-evaluation tab, the student looks back at his/her learning experience and reflects on their learning goals and how well they have achieved their goals. Students evaluate their learning in line with the agreed success criteria. This process supports the student in setting future learning goals which corresponds to Hattie and Timperley’s third question ‘Where to next?’.

Sample My Learning Activities

Sample ‘My Learning’ Section (from the English class of Slovenian teacher Petra Mikeln, OS Polje)
REFERENCES


26. The Benefits of E-portfolios for Students and Faculty in Their Own Words. *Association of American Colleges and Universities*. (Winter, 2009), Vol. 11, No.1


